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HARCOURT'S
FLORIDA FRUITS
AND
HOW TO RAISE THEM

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FLORIDA FRUITS,

AND

HOW TO RAISE THEM,

BY HELEN HARCOURT, *pened by*

(Of Leesburg, Sumter County, Florida.)

Warner, Helen, Penni
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INTRODUCTORY.

In laying the present work before the public, the writer has carefully gathered together all the available "odds and ends" of the varied experiences and experiments of the older and more intelligent fruit growers of Florida, in addition to considerable personal observation and experience, and in so doing trusts to fill a gap in the practical literature of the "American Italy." Books there are, small and incomplete, on orange culture, but none that treat in a full work-a-day manner of the other varied "Florida Fruits, and How to Raise them."

This important gap the writer has sought to fill in such a plain, simple manner, that the veriest novice may make a success of fruit growing in his Florida home, while the concluding chapter will teach him how to use such of those fruits as are not usually familiar to the Northerner.

Many of the Florida fruits have not been touched upon, as being purely tropical, and confined to a comparatively small portion of the State. Among these the cocoa-nut palm is the most important, and is destined to become a source of great profit in the regions of Key Largo, Key West, and the extreme southern coast of Florida.

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ORANGE CULTURE.

CHAPTER I.

ITS RISE AND PROGRESS IN FLORIDA.

HROUGHOUT the length and breadth of the Horticultural world, there is at this moment, and will be for years to come, no one tree or fruit, possessing so all-absorbing an interest as the far famed, luscious orange. And good reason there is for this pre-eminence of the "golden apple," as we shall presently see—its fame is not built upon a sandy foundation, but upon a gold-bearing rock, and as such it shall stand forevermore.

An orange grove is at all times intrinsically beautiful, whether laden down with its yellow fruit glistening amidst the dark green foliage, or standing clothed in the glossy glory of the latter alone, or dotted all over with its starry white blossoms, and filling the balmy air with their sweet breath.

Most truly, "a thing of beauty and a joy forever," is an orange grove to its happy possessor, and in using the word "forever" we do so advisably, for no one who owns a grove at the present day, will live to see its decay, or the failure of one jot or tittle of its usefulness, rather the contrary.

We remember reading a rather sarcastic story of some young girls, who to settle a disputed point, applied to a maiden lady of eighty years old, with the question :

"How old must a woman be before she gives up all hope of getting married?"

The old lady (so the story runs) shook her head, and made reply—

"Girls, you must ask some one older than I am." So with the orange tree.

At Cordova, that far-famed seat of ancient Moorish splendor and luxury, there are still remaining a number of monster orange trees, known to be seven hundred years old; their trunks are partly hollow, their bark cracked and rugged, and yet each year these doughty old giants yield up their seven and ten thousands of large, luscious golden balls, as though yet in the hey-day of their youth; and who knows? perhaps they are! Certainly, as yet they show no intention of dying of old age, nor of retiring on half pay, nor of shirking the active business of their lives, and doubtless, if one versed in their native tongue were to say to them—

“How old must an orange tree be before it ceases to bear?” they would shake their great, bushy heads and reply.

“You must ask older trees than we are!”

Even in England, at Hampton Court, where the tree is raised only as a curiosity, and is carefully sheltered under glass, there are several, the register of whose birth bears date of over three hundred years ago.

So you see it is no rash assertion, this of ours, that no orange grove owner will live to see his trees cease to yield him an income and a good one too, if he but treats them with moderate kindness, unless, indeed, some extraordinary extraneous cause supervenes to destroy them, such as fire or flood, which may be reckoned as among the impossibilities.

Before referring in detail to the mode of culture pursued in Florida, in raising this justly celebrated fruit, a brief glance at its origin may not be amiss.

An earnest naturalist, Galessio, was the first to trace its history with any degree of authenticity, and the result of his careful researches he published to the world, in his “*Traité du Citrus*,” issued in Paris, in the year 1811.

According to this author, the Arabs, penetrating further into the interior of India than any foreign nation had done before, discovered the orange family flourishing there and held in high esteem by the natives.

From this point the Arabs conveyed the sweet, now called China oranges, into Persia and Syria, and the bitter orange, now called the Seville, found its way into Arabia, Egypt, the north of

Africa, and Spain; from these points the orange traveled into other countries, notably China, and in this latter empire it so flourished and spread, far and wide, that by and by it came to be a fiction believed in by Europeans, that the orange was indigenous to China.

Galessio shows, however, that the so-called "China orange" is by no means a spontaneous production of that country, and his statement is further corroborated by the absence of all mention of this fruit, in the exceedingly minute and circumstantial account given by the father of modern travelers, Marco Polo, of the productions of China.

The orange was not known to the ancients, either in Europe or Syria, and the palm of its introduction to the world must be accorded to the Arabians, whose anxiety for extension of medical and agricultural knowledge, was almost equal to their zeal for the propagation of the Koran.

The sweet orange which they carried to Spain spread thence into Portugal, Sicily, St. Michael and the Mediterranean islands, and the West Indies.

In each and all of these various places has the difference in climate and soil produced varieties and changes in the characteristics of the original common stock, so that in these days, the Sicily, St. Michael, Maltese, Havana, and a great number of others are well known and established varieties of this noble fruit. To suppose, as many do, that the orange is a spontaneous production of the soil of the New World, is to make a great mistake; only where the early Spanish or Portuguese landed and penetrated into the country, is the wild orange of America to be found.

On the banks of the Rio Cedeno, in the midst of a great forest, Humboldt, to his amazement, came upon a broad belt of wild orange trees, laden with large, sweet and most delicious fruit. "Surely, these must then be indigenous to the soil!" he thought; but subsequent inquiry led to the discovery that those grand old trees had once formed a portion of extensive groves planted by the Indians from seeds obtained from their early Spanish visitors and conquerors. And to this same source does Florida owe her beautiful wild groves; only here, whether by the accident of soil

or seed, the wild fruit is sour, not sweet.

Ponce de Leon and his successors, but most all of the unfortunate French colony, barbarously massacred by cruel Menendez, "not as Frenchmen, but as Lutherans," were directly instrumental in introducing into the "Land of Flowers" the noble fruit that is rapidly becoming the chief source of wealth and happiness to its adopted home. Briefly, the orange is not a native but a naturalized citizen of the United States.

Looking back only a few years, from our present point of enlightenment, as to the inestimable value of this once neglected tree, it is very hard to understand how it is that the native Floridian did not long ago wake up to the realization of the wealth within his grasp, of the golden apple lying neglected at his feet. And yet there were, it is true, several causes conducing to perpetuate this strange blindness; for one thing, Florida, though it contains within its borders the oldest city, by forty years, in the United States, has ever been, owing to a conjunction of circumstances, one of the least known, and most sparsely settled of them all; owned first by one European power, then by another, before finally passing into the Federal States; torn and distracted by Indian wars and raids, and lying in a remote corner of the Union, completely out of the general line of travel, it is not to be wondered at that Florida was, except to a very few, a sealed book. It is true that there were a few intelligent, wide-awake Southerners who held the orange at an approximate to its true value, but these men were content to set out and cultivate their trees on a comparatively small scale, and they never penetrated further into the country than the St. John's River, and St. Augustine, where, too often, a severe frost would injure the tender trees, and discourage their owners.

Beyond the points just mentioned, few settlers were to be found, and those few, were, almost to a man, of a low and ignorant class; men who were satisfied to saunter lazily through their days, existing on "pork and hominy," or whatever else was "easy to grow and take care of itself," in which category were included vast herds of cattle, which ever and anon, they drove to the nearest sea-port for shipment to the West Indies. To such as

these, the luscious sweet orange of Europe, so well known in the Northern States, was a boon unknown and undreamed of; they knew, it is true, that, scattered over the central and southern portions of Florida, were wild groves of beautiful trees, bearing a large yellow fruit, but that fruit was exceedingly bitter and sour, and held by them in no esteem.

It was not until our unhappy civil war had come to a close, and the *ancient regime* was broken up, that a new people began to press beyond the borders of Florida, bringing in their midst the commencement of a new era in its hitherto stagnant civilization.

Even then it was sometime before the attention of these new comers was drawn to the capabilities of the wild sour orange groves scattered all around them in the rich hammock lands, and the first bold pioneer who ventured to experiment upon their true value, met, as is usual in such cases, with no encouragement from his neighbors, but rather determinated opposition and ridicule.

A case, in illustration, was related to the writer recently by a neighbor, a lady who is now the proud owner of several fine bearing groves: Fourteen years ago she removed with her family from the Northern part of the State down into the "Great Lake Region," and "Orange Centre;" building a home in the piney woods for the sake of health. The want of shade was at once apparent; to supply this *desideratum*, several large sour orange trees were transplanted from a wild grove near by. They flourished exceedingly well, but their fruit was allowed to rot upon the ground, uncared for. One day there came a stranger, who argued so eloquently upon the great gain to be obtained by cutting their tops off, and inserting buds from a sweet orange in their trunks, that, sorely against the will of our informant, her husband proceeded to follow the stranger's advice. "I scolded and cried, and cried and scolded," she said, "but it was of no use; the tops of those splendid trees were sawed off, and the little green sticks the stranger gave us were put into the bark of the poor, bare trunks. In a few months, seeing how fast the buds were growing, I began to think perhaps there was some truth in the stranger's words, and in three years, when I saw a fine crop of splendid oranges, the sweetest I had ever tasted, I blessed the stranger, and thanked

my husband for cutting off the tops. We succeeded, some time after, in getting a few sweet oranges from New Orleans, and planted the seed, and some of our neighbors did the same; we also budded a few more sour stumps. But even then, none of us ever dreamed of making a business of raising oranges to sell. We knew so little of the North, and were so shut out from the busy world, that it has only been within the last eight or ten years that our people have really waked up and begun to plant out groves in earnest."

Having thus endeavored to show why this great industry of the future has lain so long in abeyance in a land where all the essentials for its pursuit, even to the wild fruit itself, have existed ever since its earliest settlement, we will pass at once to the practical details of orange culture.

At the very outset the Florida orange grower labors under a disadvantage; his business is a new one, and consequently, he is, to a considerable extent, dependent on a series of experiments. The new comer finds but a limited store-house from which to draw his practical information; his neighbors have bought and are still buying their own experience, and he must do the same in a great measure, for the points in orange culture on which all growers agree, are very few. How can it be otherwise, with an industry which is only in its infancy?

The oldest orange trees in Florida are but babies, as it were, and comparatively few, out of the thousands of groves set out, have even as yet, reached the age of maturity; it will be many years still, before orange culture will have reached the perfection of a science, as has the culture of the older orchard fruits of the North.

We are apt, at a distance, to associate poetry and romance with the very name of an orange grove, but when one sets to work in earnest to "make" one for himself, the cold, stern facts, that ever beset the business life of man, come to the surface, and he learns that some money, more time and labor, muscle, patience and perseverance are necessary, before his embryo grove becomes self-sustaining.

It is not play to plant and conduct an orange grove from

infancy to bearing and paying maturity, and it is because the idea that it is all play, all "fun" to "make a grove," has been so prevalent, that there have been so many disappointments, so many discontents returning to the North, with the report that "orange groves are humbugs."

The more thoroughly the in-coming settler realizes that orange or other fruit growing is a regular business, requiring, like other business pursuits, the investment of more or less capital, and a good deal of care, time, judgment and perseverance, the more thoroughly he realizes this, we say—the better prepared he will be to meet and conquer the various vicissitudes and drawbacks that are sure to occur during the long years of work and waiting that must be encountered before he can sit down, at last for the rest of his life, in the enjoyment of a good and steadily increasing income.

Far be it from our wish to discourage the would-be orange grower, rather would we urge him who seeks health and competence; aye, more wealth, to come to Florida, and make unto himself a "Fortunata's purse" of the golden orange, but we would have him come realizing that here as elsewhere, the great law of nature which decrees that nothing that is worth the having, can be obtained without toil and patience, is in full operation.

So many have come to Florida, full of enthusiasm, full of the idea that it was only necessary to stick the trees in the ground, anywhere and anyhow, and then sit with their hands in their pockets, as it were, for a year or two, in order to reap a full grown fortune, that we feel it our bounden duty to give full warning that though an orange grove is a glorious thing to own, and will give its possessor competence and wealth, yet, still it is not to be obtained without time, labor and patience, or their equivalent in money.

The latter, when the settler is fortunate enough to be able to purchase a grove ready made.

And right here is another point to which we would call attention.

We often hear complaints of the "high prices" asked for bearing groves, now, these so-called high prices are as a rule, very

low prices in reality, when one stops to consider the years of toil and care and perseverance that have gone to "make" each grove, through all the time of their slow growth, not only so, but what of the actual money value of said grove?

Why does the would-be purchaser want to buy?

Because he expects a good income from his grove? Exactly so, and now we will ask one more question.

If he went to an office where annuities are sold, would he expect to purchase an annuity, annually increasing in amount, for a mere nothing? Scarcely!

Yet that is just what these men who are not willing to pay a fair price for an orange grove are seeking to do.

CHAPTER II.

WHAT HAS BEEN AND MAY BE.

Having pointed out the rock on which so many fair barks have foundered, let us now look at the other side of the picture, and see what has been done and may be done again by those who start aright, and regard orange growing not as a pleasant pastime, but as a serious, earnest business, to be carried out faithfully, carefully and intelligently, like any other business in which success is desired, and to be learned and studied as such.

What reasonable man would expect to be successful in a pursuit entirely new to him, without seeking such sources of practical knowledge thereof as might lay open before him?

And yet there are men, who would bristle all over with indignation were it to be hinted that they do not possess common sense, who yet embark in a new life as orange growers, and think they will succeed, while they scorn advice, refuse to seek counsel of those whose experience is of many years standing, and turn their backs scornfully upon the books and periodicals written by practical men familiar to the business so new to them.

Such self-sufficient egotists as these will fail, as orange growers, and either leave Florida pronouncing her noble groves humbugs, or else turn back to the beginning, and wisely seek the course they before despised.

The man who meets with as few drawbacks as possible, and pushes forward his grove to its utmost capacity, is the man who is not too proud to confess that he does not know more about astronomy than the astronomer, more about geology than the geologist, more about farming than the farmer, more about orange culture than the life-long orange grower.

Therefore, ask opinions and advice from older settlers ; do not take all you hear for facts, nor all for fiction ; take notes and compare them ; weigh conflicting opinions and strike a balance ; look about you with a view to learning something useful for you to

know ; do not trust entirely to hearsay ; find out all you can by actual trial and experiment ; study reliable books relating to your new business ; take one or more weekly papers devoted to the same cause ; be energetic, persevering, careful to do your best and make the most of the advantages you possess ; never use or practice those three most reprehensible words in the English language "too much trouble."

Do these things, and in eight or ten years from the day you set foot in Florida, a penniless man, perchance, you will be in comfortable independence. Aye! more than independent for all your life to come, and your children, and grand-children after you.

Every man who has succeeded in raising a grove, has done so by pursuing just such a course as we have suggested ; and no man will fail who is content to follow in their footsteps.

One of our earliest pioneers in orange growing was an Englishman, John Eaton, by name.

He served in our army during the Seminole War, and when discharged at its close, in 1837, accepted the offer of the Government to give one hundred and sixty (160) acres of land to any soldier who would settle on and cultivate a portion of it.

We, in these enlightened days, know how to envy this man the grand opportunity, for selecting choice lands that lay before him, but he had not our knowledge.

The wondrous value of the wild orange tree was a sealed book to him ; he was a plain working man, and at that time an invalid ; all he sought was a quiet place in a mild climate, that "his days might be prolonged in the land" so he selected his homestead on the St. John's River, in Orange County ; he built him a little hut on a small shell-mound, where about 50 wild orange trees were growing, and there with fish and game at his door, and a small garden patch by his side, he dwelt alone for twenty years.

Some one came along after he had been there a short time, and initiated him into the mysteries of budding ; and then more from curiosity than with any thought of profit, he budded his fifty wild trees.

He "buidled better than he knew;" in a few years these

hitherto despised trees, brought him all, and more than all the cash he needed.

When the lonely recluse died, no heir came forward to claim his property, so after due time the State stepped in and sold it to the highest bidder.

And thus John Eaton's grove became the property of the Hon. W. W. Woodruff, for the sum of \$3,000

The property would have brought much more if it had not been that the soldier had made so very poor a selection of land, that only a few of the hundred and sixty acres are good for anything, and these are only a few feet above the river, so that in unusually high tides the grove suffers; besides this, the only building site is so near the river, that it is not healthy to live there, and so much overflowed land extends all around it, that whoever dwells there must be content without neighbors.

Yet, in spite of these serious drawbacks, the little place sold at Mr. Woodruff's death, for \$9,000, triple the price, you see, that he paid for it.

There are, we have said only fifty trees in this grove, but from those fifty trees, crops often net from \$1,500 to \$1,800 in a season.

Who has not heard of the famous "Big Tree" of Florida? which oftentimes has 10,000 oranges at once; oranges so fine that they have sold for \$2.40 per hundred; thus netting from this one tree \$240 in one season! It seems incredible, does it not?

Yet it is strictly true, and not only so, but this tree is only one-fiftieth part of a grove, where each individual tree seems to take a pride in bringing to its fortunate owner an annual offering of from two to five thousand oranges.

This famous "Big Tree" stands apart from the rest, in solitary grandeur, and is a glorious sight, whether clad in its every day uniform of green, or dotted all over with its fragrant white blossoms, or laden with golden fruit.

Note the fact that it is of the same age as the rest of the grove, was budded with them, and has received the same treatment, but it stands alone; we shall have more to say in this connection, by and by.

So, now we have seen what one poor ignorant soldier did, in a careless hap-hazard way ; he might have done much more, had he known all that we know now-a-days.

John Eaton died, but his trees lived on, and prospered, and their fame at last reached the ears of a relative of his, then living in Canada, and he came to Florida to try to claim the estate, but we believe he failed.

The story he told of the events that led him here may well seem to "point a moral, and adorn a tale" in the wonderful contrast between the work of the pioneer of the North, and him of Florida.

Ten years before Eaton settled in Florida, the father of the gentleman alluded to settled in the wilds of Canada.

For thirty years he toiled, and endured hardships and privations, and by that time had cleared and brought under cultivation one hundred acres of land.

But all the time he was working, the climate was working too ; it killed three of his children with consumption, killed his wife by a combination of diseases brought on by working in the snow and mud, and finally killed him also, with inflammatory rheumatism.

The one son who was left, rented the farm, won by thirty years of toil, for the paltry sum of one hundred and fifty dollars a year, and fled to our genial State to save his life, and reflect at leisure over the vast contrast between the results of the thirty years of toil on his father's part, and the twenty years of ease, of his cousin, John Eaton.

It was all in the difference of location, one settled in a cold inclement country, the other in a mild, genial clime, one of nature's garden spots.

Of course, it is easy to go North, to any of our old settled States, and point out fine fertile farms, worth many thousand dollars, places that have been carved out of the wilderness, by the work of one generation.

But then, what if the same amount of time, money and intelligence, had been spent in Florida ?

Why the difference would have been as startling as that be-

tween the work of John Eaton, and his cousin in Canada.

And now let us come down to later times, and to men who were not pioneer hermits, but pioneer settlers.

We know of an island in Lake Griffin, containing three hundred acres of rich land, studded over with orange trees, once wild, but now budded, and yielding luxuriant crops.

Twelve years ago the first small improvements were made here, the land and work together costing fourteen hundred dollars; last year the proprietors received six thousand dollars for their crop, and refused an offer of forty thousand dollars (\$40,000) for the property.

Eleven years ago a father and two sons, ruined by the war, purchased eighty acres, with a wild grove on it, for five hundred and fifty dollars.

The trees they budded with the sweet orange; and they took care of the trees as best they could; they were so poor that they were compelled to use their own strong arms to cut down trees, with which they built a rude house to shelter them, and the little furniture needed was fashioned with their own hands.

They managed to live somehow—it is easier to rub on over a hard road in a mild climate than in an inclement one—and took good care of their trees; though they themselves might suffer for food, they were determined their trees should have “full and plenty” for they knew them to be the “geese that would lay golden eggs.”

And they were entirely right.

Last year that hard-won grove brought them in nine thousand dollars, and it has really just begun to bear.

The hard working days of this trio, are over, they may take their ease, while a skillful man, at a good salary, look after their “golden geese;” and they have merely to sort and pack the “eggs,” and this, by preference, as wise men who would make sure that the fruit is properly sweated, graded, and packed, for on these important points, depends the good or bad fortune of the crop; what matters it if a grove yields its thousands of luscious fruits, if those fruits are rotted and valueless by the time they reach the market?

As we have said eleven years ago these three men were penniless, now seventy-five thousand dollars would not tempt them to sell their grove.

In 1870 a gentleman whom we know, purchased a wild grove on Lake Harris for five hundred dollars; now he has twenty acres of bearing trees, and refused to sell for fifty thousand dollars.

Two years later, just ten years ago, another settler bought forty acres of land for less than four hundred dollars, budded the few trees growing wild, set out more, and now has sold land to the amount of two thousand dollars, and holds the balance at twenty-five thousand.

Now look at these figures for a moment, and ask yourself what safe, reliable legitimate business could you engage in at the North, with a capital of five hundred dollars, and in ten or eleven years have augmented that capital, to such an extent!

Yet, one more example and we are done.

In 1874 a gentleman bought for \$6,000 a rich hammock tract of five hundred and sixty acres. On this tract were four acres in a wild grove; six hundred large bearing trees, besides many young seedlings. The bearing trees he budded, leaving some as they stood, but moving others where they were too crowded.

The trees thus moved were of course set back several years in growth, but from the four hundred that were left in their original position, when three years only from the bud, the neat little sum of twelve hundred dollars were obtained; at four years from the bud, these same four hundred presented their fortunate owner with sixteen hundred dollars, and at five years one hundred of the transplanted trees having advanced into the ranks of the bearing ones, the crop netted seventeen hundred dollars, and would have brought one thousand more, but for a severe gale that blew off a large proportion of the fruit.

Now this is the showing of just four acres out of five hundred and sixty purchased for six thousand dollars.

How about the rest?

Two hundred and sixty acres have been sold for twenty-one thousand dollars. Three hundred acres and the grove referred to

remain in the purchaser's hands, and on these three hundred acres laid out in young groves for sale, are six thousand flourishing trees budded on sour stocks raised on the place, besides two thousand more in the nursery.

Sixty thousand dollars would not purchase these three hundred acres with the bearing trees and young groves they contain.

Think for a moment!

Eight years ago the investment of six thousand dollars was made, and to-day, eighty thousand dollars is a low estimate of its value.

We could go on multiplying instances indefinitely, but these will suffice to show that the culture of the orange, when properly conducted, is a good money making investment.

Even for the man who does not need the income from his grove for the support of his family, there is no better investment for his surplus money, and it would be difficult to find a safer one.

When an orange tree is in full bearing, it is valued at one hundred dollars all over the State, and this is no fictitious value either, for certainly a tree is worth the money which it represents. Now a tree bearing one thousand oranges at one cent each, represents an income of ten dollars, the principal of which in Florida at eight per cent, is one hundred and twenty-five dollars. As the trees become older the orange bearing also increases.

There is no probability of the supply of oranges from Florida ever exceeding the demand, as the orange belt is confined within narrow limits, while the population of the country is rapidly increasing, and is capable of almost indefinite expansion.

But while an orange grove is a splendid investment for a rich man, it has also its bright side for the poor man.

Nine-tenths of the prosperous orange growers in Florida came here less than a dozen years ago, some with a few hundred dollars in their pockets, but more with only a few hundred cents. One gentleman arrived here with less than a cart load of household goods and ten dollars of borrowed money. He patiently bore privation and worked for his neighbors, using his surplus money in improving his homestead, little by little; now he is in the enjoyment of many thousands of dollars.

There are thousands of young men in the inclement North, toiling wearily along through the years in the hope of ultimately winning a home for some dear one who is patiently waiting for the happy day to come. Let these, and such as these, turn their faces Southward, and in less than "seven years," amidst Florida fruits, they will have won independence and their Rachel.

CHAPTER III.

FROM SEED TO GROVE.

Few amateur orange growers realize the importance of good, thrifty stock at the very outset, but it is a point that cannot be too strongly insisted on, for herein lies the corner stone of a successful grove.

Given poor, diseased, stunted stock, and you may lavish time money, care upon it, and be worse off in five years time than when you began ; given good thrifty stock, and half the time, money and care, will find you in the same space the owner of as fine a young grove as one would need to possess.

How to secure such reliable stock ?

Well there are three ways ; one to go to a neighbor who has preceded you by several years, and has seedlings for sale, purchase them and bud them yourself ; another, to purchase trees ready budded from a reliable nursery man, and still another, which will best suit a shallow pocket, is to plant the seed and when the trees are a suitable size bud them yourself.

There is a right and wrong way of doing everything in this world, and it is sometimes curious to see how frequently the wrong way is chosen when the right way seems just as easy, and is certainly productive of more satisfactory results. Now in this apparently a simple matter of planting seeds ; most persons will take the seeds hap-hazard from any orange they may happen upon, the more the better, and going out, will punch a hole in the ground with a finger, drop in a seed, give it a pat downwards, and go away exultant, and return in a week or two to dig up a fine healthy plant.

Others will push the seed down into boxes and water them carefully every day and rot them, while others will not water them at all, but leave the sun to shine upon their covering of soil and dry it to a powder.

And then they wonder and scold—these three types of amus-

ing people—because “these seeds won’t come up, bad luck to ’em,” and so it was truly “bad luck” for the seeds when they fell into such hands.

But there is a right way of doing this simple thing and let us now see what it is.

In the first place, there are seeds, *and* seeds, and by no means are all fit to plant because they are called “seeds.”

A seed should never be planted except from large, ripe, well shaped and fine flavored fruit, no matter whether your ultimate object be a seedling grove or only stock to bud on.

And not every seed from these should be planted either, but only the plump, sleek and well-to-do looking seed, these alone will make thrifty growers, either for seedling or budded stock.

Never allow you seeds to dry off before planting, if you do, throw them away, as they will never germinate.

If it is not convenient to plant a few at a time as you collect them, either allow your choice oranges desired for seed to rot, the seeds remaining inside, or better still, get a small box, half fill it with sand, saturate the latter with water, put it in a shady place and mix in your seeds with your sand, being sure they are well covered, if you have no shade convenient, it will do to mulch with moss heavily or with trash.

But mark this; do not water the box again, or your seed will rot.

Thus treated, seeds may be kept in good condition for planting for ten days or two weeks, examine them every two or three days, and if they show signs of sprouting, hurry them into their permanent burying ground.

We would advise every settler to have a nursery of young trees, even if he is able to purchase all the trees he needs for his grove. The trees will never come amiss, and they require but little care once fairly started on their life’s journey.

For raising a limited number of seedlings, say two or three hundred—cast off boxes—such as may be had at any country store, are to be preferred to the open ground.

Even better than several small boxes, is one large one, such as can be made at home in a short time. Make a box ten inches

deep, two feet wide, and as long as your boards will allow, twelve, sixteen or twenty feet, a bottom is unnecessary ; nail on braces to keep the boards from spreading, fill the box with sand mixed with well rotted stable manure, or with a small portion of commercial fertilizer mixed through it ; pack it down firmly. Pour on water until the ground is thoroughly saturated, then with a pointed stick make a number of parallel grooves about one inch deep and about six inches apart.

Drop your seeds three inches apart in the little trenches, thus drawing the soil on top and with a small piece of board press it down as firmly as possible.

Now, mulch your box with grass or moss (and when we speak of moss, now, and hereafter, we mean the gray "Florida moss") the moss is the best, as it does not pack, and while it retains moisture, allows a ray of sunshine to penetrate, now and then to the soil, to coax into being the little embryo which is buried that it may live.

Let the sun reach the seed box during a greater part of the day—all day, even, would do no harm—if the mulch is heavy ; do not water the seeds more than once a week, and not then unless the soil is dry.

More seeds are lost by being rotted by a superabundance of water, than from any other cause ; the soil in which they lie *perdu* ; should be moist but not wet.

This is true, not only of seeds of the citrus family, but of all seeds which is the inevitable fate of those that are not.

This mulching of seeds is not, we believe the usual practice, but our own experience has proved, again and again, that seeds thus kept uniformly moist, will germinate in one half the time required by the same seeds, when subjected to the usual alternations of dry and wet, thus protected.

But if young plants are desired by the thousands, and tens of thousands, then the seeds must be sowed in the open ground.

Here too, there is a right and a wrong way ; a careless, or a systematic method of doing the work, and the latter always comes out ahead.

In laying out the seed beds, it must be borne in mind that

you will hereafter want to hoe and weed your young plants ; therefore leave a space two feet wide between them, the beds themselves being three feet in width. This will allow you to reach the centre from each side.

See that the seed beds are well cleared of trash, grass, sticks, etc., and make them level and smooth ; then make your trenches six inches apart, and drop your seed as in the boxes, or sow broadcast if you prefer it, being careful not to sow too thickly ; press the soil down firmly, then cover your beds with a mulch of pine straw, grass, well rotted sawdust, or moss, it matters little what is used so that it keeps in the moisture, and shields from the hot sun.

A barrel of oranges will furnish from four to eight thousand plants ; to separate the seed from the pulp, when such large quantities are to be sorted, one needs a seive with a quarter-inch mesh, a good stiff brush, and an abundance of water.

The ground should be moist when the seeds are planted, either by rain or profuse artificial watering, and should be kept so, until the seed are up, which will be in from ten days to two weeks ; without mulching they are often four or five weeks in making an appearance.

As soon as the first plants are fairly up, remove a part of the mulch, so that they will meet with no resistance in pushing their way upward, and after a few days remove it entirely.

Keep the seed bed watered until the plants are about three or four inches high, and then after a drenching rain, replace the mulch around the slender stems.

It is an excellent plan to soak the mulching material in liquid stable manure (twenty pounds to a barrel of water) for a few hours before applying it to the nursery bed.

Orange, or any other plants, in fact, thus raised and cared for, will make such a thrifty growth as will astonish their owner, and amply repay all the time and trouble lavished upon them.

There is another way of protecting the young trees from the direct rays of the sun ; a method that is extensively practised in many large nurseries ; it is more trouble and expense than the process just described, but as it has the endorsement of practical

horticulturalists, we give it for the benefit of those who may prefer it to mulching.

Drive stakes four feet long into the ground, to the depth of one foot; along the borders of the bed, six feet apart. Nail narrow strips to the top of the stakes, or rope, or wire may be used, if more convenient, then stretch over the frame-work thus prepared, some thin guaze like material, coarse bagging, or the slazy muslin called cheese cloth, for instance.

If the beds are more than three feet wide, it will be well to place stakes four and a half feet long at each end of the bed, in the center, with a strip running from one to the other; this will raise the awning in the centre, like a double pitched roof.

Sheltered from the fierce heat of the sun, yet receiving plenty of light, air and moisture, the young plants will grow very rapidly, but more weeding will be required than when the mulching is used.

By the time the plants have attained the height of twelve or eighteen inches they are ready to be removed from the seed bed to the nursery, and further shelter may be dispensed with.

The same canopy protection may be used over the seed beds as well as over the plants already up.

In raising plants of the citrus family, especially in the open ground, there is an active little enemy to combat against, an enemy whose name is legion, and who, if allowed to follow out their own plans, will nip off the embryo leaves of the plants the moment they appear above the ground. We refer to those very industrious creatures whom the primers hold up to us as an example to emulate, but it could be wished that their proverbial industry was more tempered with judgment in consideration for struggling humanity.

We mean ants of course. They evidently regard citrus leaves as especial dainties, and must be taught to keep their distance.

An application of air slacked lime, or hard wood ashes, will dampen their ardor, or better than anything else in our experience, is a liberal watering of the ground, or mulch with an application of "Gould's Fertilizer and Insect Exterminator," one

pound to two gallons of water.

This is not only effectual in keeping all insects at a distance, but is an excellent fertilizer as well, thus "killing two birds with one stone."

This is a "homemade" fertilizer as it were, being manufactured in Jacksonville, and very easily procured.

And now, having got our trees ready for the nursery, let us see what is the proper location for the latter, and how best to remove the embryo "gold mine" to its nourishing care.

It is an important thing to make a good selection for a nursery; because the plants are small, is no reason why they should not have the best possible care, unless you want them to remain small indefinitely.

Hammock land, with the roots thoroughly cleared out, and mellowed by frequent workings, is good, but pine land is better, trees reared from their earliest infancy in rich hammock soil, and then transplanted at three or more years of age, to pine land, will be apt to droop and pine, and either die outright, or else linger along for years only half alive, just as a child tenderly reared and cared for, will droop if suddenly transplanted to a life of exposure with coarse and insufficient food, for every nursery tree that is set out in a hammock grove, one hundred at least are set out on pine land; therefore, let them start out in life, on the kind of food they are to have in after years; then when they set forth on their life work, in our great groves, there is no violent change in their nurture, and thrift and vigor are assured.

The site for a nursery should be on a slight rise to insure proper drainage without ditching; hard pan or clay should be not nearer the surface than three feet; the exposure should be southerly, and the site protected as far as possible from high winds.

If water cannot be easily procured from a neighboring lake or pond, dig a well in the center of the nursery; it will repay its cost by the number of young trees it will save, for water they must have, and a plenty of it, during their first summer in the nursery; after that they are old enough to take care of their own water supply.

Here again, mulching is of great advantage in preserving

the requisite moisture, and although it may, as some demur, bring the roots to the surface, that is just what you want in a nursery, as it facilitates the final digging up of the trees, and fewer roots are broken in the process than would be the case if they were more deeply rooted.

Lay out the ground for the nursery carefully; a little extra care now will save a great deal of work and annoyance in the future. Run the rows north and south four feet apart, so that the sun may reach the whole surface of the ground; let the latter be as level as possible, and free from trash; and if you work in a light dressing of well rotted manure, and muck, or commercial fertilizer (we believe that already mentioned to be superior to any other) so much the better.

The length of the nursery rows should never exceed three hundred feet, as at this distance apart, running at right angles, with the rows, there should be roadways, for horse and cart, not less than eighteen feet, this allows for turning without trampling on the beds.

With regard to laying out the nursery in the manner described, we cannot do better than to transcribe here a method taken from a valuable work by Thos. M. Garey, termed, "Orange Culture in California."

"Provide a strong rope, cord or wire, a few feet longer than you wish the rows to be; a four feet measure at each end of the section, with which to mark off the distances between the rows, two good hard wood stakes, or iron pins, which are better, and tools with which to drive them firmly into the ground.

Fasten one end of the rope, cord or wire, to a stake driven at one end of the proposed row, straighten it if necessary.

For marking the spaces in the row, use a tool made similar to a hand roller with triangular pieces a few inches long fastened lengthwise to the roller, a foot apart. Four feet in circumference or a small fraction more than fifteen and one-fourth inches in diameter, is a convenient size for the roller.

To use this tool, take hold of the handle, place the roller on the tightly stretched line, and push it forward or draw it after you along the line; the pieces on the roller will mark crosswise of

the line at regular distances of a foot. If any other distance be desired, it can be regulated by the diameter of the roller, and the distance between the strips. Remove the line to the next proposed row. This leaves a mark lengthwise, crossed at regular distances, ready to receive the plants; a roller of greater diameter would require less power to use it."

Now these directions may seem uselessly complicated and troublesome, but try it once, and you will try it again. It saves a great deal of time and trouble, and lays out the rows more accurately than is possible in any other way, and the after ease with which the trees can be cultivated, will amply repay for the extra care at the start; it is much easier to plough a straight row than a crooked one.

The four feet space between the rows permits the cultivator, harrow, or plow to be used, and the one foot space between the young trees allows of thorough hoeing.

The ground should be thoroughly moist, both in the seed bed and in the nursery; when the plants are to be moved, never under any circumstances attempt to transplant when the soil is dry; either wait for a soaking rain or water the ground artificially.

Loosen the plants carefully, thrusting the spade down perpendicularly, and work it back and forth until the soil is detached from the roots.

The moment the plants is out of the ground put them in the shade; more harm is done to trees, old and young, by allowing the sun to touch their tender roots, even for a few minutes, than many people realize.

Never take up more than a thousand at a time, unless there be a large working force, for it is of the utmost importance to keep them out of the ground as short a time as possible.

Sort the plants, and throw away all the stunted, inferior ones, for they will make only stunted trees; the Spartan plan, of putting to death all the weakly, sickly infants, is a good one to practice here.

Prune back the tops, and make them as uniform in size in each row as possible.

It is a good plan to place the trees in small boxes and throw

wet soil on the roots, withdrawing them one by one, as they are set in the rows, or else place the roots in pails of water.

In planting, press down, and back and forth a nurseryman's dibble at the intersection of the rows and crosslines, put the roots in the hole thus made, pack the soil down firmly around them, being sure to leave no vacant spaces anywhere.

Then mulch the plants, keep down the weeds, give them a sprinkling now and then of some kind of fertilizer, not too much, however, for it is not wise to accustom them to too "rich living."

For the first year after setting out, let them grow as bushy as they please; the foliage will shade the tender bark of the stem, and encourage the formation of a mass of fibrous rootlets; but after the first year, it is well to prune surplus branches, leaving one leader to form the stock of the future tree; do not let the little shoots that put out along the stem do any more than show themselves before you pinch them off; keep a foot or two of the stem clear of branches.

From the second year on, you can bud your young seedlings with some choice varieties, and then in from one year from the bud, each little tree will be worth thirty cents, and in another year forty or fifty cents, according to variety and growth.

Or as seedling, two year old trees sell at twenty cents, three years at thirty, four years forty, each year adding \$10 per hundred to their value.

There is now, and will be for years to come, a brisk demand for young trees, both budded and seedlings, and the thrifty far-seeing settler may readily clear several hundred dollars annually with the investment of no capital, save that of a little care in planting seeds, and raising a nursery.

CHAPTER IV.

HOW TO BUD AND GRAFT. *

In transferring a scion of some choice variety to a new and independent life on a strange stock, there are two modes of procedure—either to bud or graft the one upon the other.

Grafting and budding are almost identical, save in the mode of approach of scion to seek ; in the former whole twigs, or even large branches are used as scions ; in the latter, only the little dormant buds that lie *perdu* in the axil of every leaf ; in grafting, the top of the tree is cut off, usually close to the ground ; in the latter, only the tips of the growing branches are pinched off,—and right there lies the secret of the universally preference for budding over grafting, for if the bud refuses, as we may say to suckle—its foster mother the tree is not injured in the least, and, if the season permits, another trail may be made at once ; while, if the graft fails, the stock has at best been put back a year or two in its growth, and indeed, may never recover from the shock at all.

The operation of propagation varieties by budding is full of mystery and wonder ; we take a tiny bud, not even developed so as to be visible to the eye, but given a growing leaf, we know that it conceals this embryo bud at its base ; we cut a slit in the bark of a tree, and cutting off this tiny bud, slip it into the aperture—and from this invisible germ a great tree in time springs forth, bearing fruit like unto its parent ! How is it done ? We know that it *is*, just as we know that our hearts beat, our lungs inflate, we can see the outward result, and watch its progress, but as to what mysterious inner force is at work to accomplish the marvelous result, who can say ?

We know that it is the cambium, or proper juice of vegetables, that serves as the means of junction between the scion and

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the stock—this is why they must be of similar nature, just exactly as in ourselves, the two lips of a wound is drawn together by the coagulable lymph which the blood deposits between them ; but we do not know how, or by what inner force this result is attained.

Examine carefully the wound of a bud when it has “taken,” about two weeks after the operation, and you will observe a thin layer of small, green granulations, in the midst of a viscid fluid, and joining the two parts that have thus been successfully brought together. These granulations are the rudiments of vegetable organization, and are deposited by the cambium, soon becoming fully solidified and complete ; and wherever there is a wound on a tree, you will find this knitting going on, just like the mending of a bone in a human being, provided that the air has been carefully excluded from the wound.

Before entering upon the practical details of the usual methods of budding, let us fully understand the several requirements necessary for its successful operation.

First of all, both scion and stock should be in active growth, both should be strong and healthy, as otherwise the value of the future tree would be seriously impaired ; the scion should be taken from fully matured shoots of the current year’s growth of a bearing tree, and always from the lateral branches, as they, for some unexplained reason, will produce fruit much sooner than a scion from the uppermost branches ; also, where it is practicable to place a bud with fruit already growing on it, in the stock fruit will be obtained much sooner than by the simple bud alone, we have just shield budded a Sicily lemon, with fruit as large as a walnut on its upper end, and we expect to see that lemon come to perfection in the bosom of its foster mother and to have brothers and sisters a year hence.

In two weeks after the operation of budding, its success or failure will be apparent. During this interval, and longer, if the bud “takes” the scion should be partially shaded from the too fierce rays of the sun, by a light wrapping of moss, or better still, as it avoids the risk of too much moisture, from heavy rains, by a board inclined against the trunk, in front of the scion.

Another point, and one not generally known, (we have only learned it ourselves by personal experience) is this: Always insert your bud on the north or northeast side of the stock; glance at the shadows cast by our hot summer sun during three-fourths of the day, and you will see the reason why—the southern and western portions of the stock being all that time exposed to its scorching rays, and insuring the broiling or frying to a brown cinder of your tender scion.

Still another thing to be attended to, before beginning the actual operation of budding, is the mode of wrapping after the insertion of the scion.

Some people give no protection to the bud at all, and these slovenly folks lose three-fourths of their work, as they deserve to do; others put a little daub of grafting wax over the edges of the cut, and these scarcely less lazy people lose at least one-half of their time and labor, and those scions that do “take” do not grow with half the vigor that they would, if properly treated at the outset.

But there are still other persons, wise in their generation, who put faith in those grand old sayings that

“Whatever’s worth the doing,
Is worth the doing well,”

and “a little trouble in the present saves much trouble in the future,” and these sensible individuals before proceeding to bud their trees, prepare a quantity of strips of strong muslin or calico, about a quarter of an inch wide; dip them into melting grafting wax, and take them out with little sticks, hang them up to dry. They will keep good for years if it need be. They are then ready to wrap lightly around the scion after its insertion in the stock, and if the end and edges are rubbed down firmly with the finger, they will not even require tying. By this simple method the scion and stock are held securely in close contact, and air and water are excluded while the process of junction is going on; a necessity, as we have already seen, to its success.

To illustrate the difference, smearing with wax and binding with waxed strips, we quote from a writer in a New York *Rural* publication; he bound a part of his scions with strips and on others used only wax.

“Those rapped with strips all grew ; of the others about one half grew ; also many of the former grew eight feet in one season, the waxed ones, without the strips, not making over half that growth. I claim that there are absolutely many chances in favor of the strips, over the other way.”

Even in the old method of regular grafting, where the whole top of the tree is cut off, these waxed strips are just as much to be preferred over the wax daubs as is budding. Try it and see, and our word for it you will never again set about this kind of work without plenty of waxed strips at your side.

There is a regular recipe for making the grafting wax most commonly used ; it is this : “ One part beeswax, one part tallow, two parts rosin ; melt together till thoroughly incorporated.”

Now, it may be presumptuous in us to meddle with this time-honored recipe, but still we will venture to insinuate, with all due respect, that in our own experience, the rosin may, with advantage, either be omitted entirely, or else be only half as much added to the beeswax and tallow, instead of double as much. We find that the strips dipped in the latter only, are fully as effective, and far more agreeable to handle ; neither do they, as some claim, become rancid without the rosin.

Lastly, a very sharp pointed, thin-bladed knife is necessary, and now we are ready to select our scions, which, as we have elsewhere stated, must be taken from, as well as inserted in, a growing plant.

Considerable judgment must be exercised in this selection, as a “ stick ” of buds may be either too old or too young. It is too old if the shoot taken be of more than a year’s growth ; too young if it be not fully matured—the woody parts hardened and the embryo bud developed beneath the axile of the leaf. It is always best to use the growth of the current season, just as soon as this stage of maturity has been reached, and a short experience will enable you to judge accurately, when this point has been attained.

These remarks apply to all scions, whether orange, lemon, peach, plum, apple, or any other of the great vegetable tribe.

And now, at last, we come to the practical details of the actual art, for it is an art, of budding.

There are several modes of introducing the scion to the stock ; of these there is one largely practiced, we are sorry to say, that cannot be reprehended too severely. A man cuts off a short stick containing two or three buds, shapes one end to a flat point, like a pen, then make a little cut crosswise in the stock, thrusts the "pen-bud" down into the slit, and passes on to scar another tree and waste another bud, boasting of how many he can do in an hour. True, it is a quick way of playing at budding—in one sense—but when, by and by, he comes back again and again to replace dead buds and search for fresh spots on the poor devoted stock, where its once smooth bark is not at all roughened and scared by old wounds ; if then, we repeat he will only keep count of the time thus occupied after the work should have been completed, and the time lost in the growth of the buds while the season is passing relentlessly on, he will come to the conclusion that a little more time and care in the first place, would have been time and trouble saved, and loss of buds, and of the growing season saved also. And therefore we would banish the "pen-buds," as the resource of lazy, ne'er-do-wells who will reap as they sow.

The one kind of budding that is pre-eminent over all others for its invariable success, if properly done, is called "shield-budding." See that your stock is cleared of all twigs that may interfere with the wrappings and then make a perpendicular slit about an inch and a half long, about four to six inches above the ground, then make another cut across at the base, the two cuts presenting the appearance of the letter T reversed thus ; the cross-cut is often made at the top, but it is not the best way. Now pass the point of your knife, or the flat handles if it is a regular budding knife, carefully along the upright cut, slightly raising the edges, giving the knife a certain little twist, easily learned, at the base, so as to leave the corners a little turned back, like the "dog ears" of a book. Now take your knife, and carefully cut off a bud from your "stick," take as little of the wood as possible, and let the back extend about half an inch below and above the bud ; now take this little strip in you hand, and,

with the woody side upward, bend the end slightly, till the thin layer of wood remaining, separates at the end from the delicate bark, then thrust your thumb nail between the two, and now holding the bud uppermost so as to keep it straight and unbroken gently pass you nail along bending the woody layer downward until it is entirely detached, leaving in your hand a nice, clean strip of bark with the bud intact; if, however, the wood has not parted readily, but has torn the bud or left a little hole in it, be sure that it was not in a fit condition for budding, and throw it away.

This may seem a difficult and delicate operation, at the first glance, but difficult? no, not after a little practice; delicate? yes; but one cannot expect to treat a tender bud roughly and have it live. If you prefer you can omit to remove the woody layer, provided you cut it as thin as possible, but it does not make either so sure a junction or so sightly in the years to come, for as the alburnum or wood will never unite with the stock, neither be absorbed, there will always be an ugly knot or ridge marking the point of junction between stock and scion, whereas the strip of bark only, unites completely in every part, leaving in after years a smooth, straight trunk, with no unsightly prominence.

And now you are ready to insert the bud, which is to be done upside down, for the same reason that you made the cross cut at the base of the perpendicular, instead of the top, namely, because in this position, as you will see, it sheds rain, and allows no water to lodge and soak in between the bandage and the bud; it is always better to leave the leaf attached to the bud, as this avoids leaving open any channel for air or moisture to penetrate, and moreover, the sap in the leaf nourishes the bud; but with or without the leaves, insert your bud upside down; push it gently up from below, till the upper end of the cut is reached, be sure that the bud-bark lies smoothly and that the lower end does not project below the cross cut; this accomplished, start the wrapping just above the upper end of the cut, holding the end firmly while you wrap, pulling tightly all the while.

Some employ two wrappings, one above and one below the bud, as it is all important to leave the bud itself—and only the

bud—exposed to light and air ; but a skillful worker will use only one strip, giving a certain downward slant to the last turn above, that will carry it below the bud in front, and then continuing the wrapping until the base is well covered ; tying the strips, as we have said, is needless. In two weeks you will know whether your work has been “for better or for worse ;” the former certainly, if all has been done “decently and in order ;” the junction always takes place at the top first, therefore, as the edges swell and unite, the top wrapping should be first loosened, say in ten days after the sprout has started, and the lower wraps a week later ; it is better to loosen at first, than to remove them entirely, as the newly formed bark needs some protection for a month or two.

Having thus investigated the mysteries of the more popular art of budding, let us next “interview” that which may well be termed its “elder brother.”

Far, far back in the olden times, the theory and practice of grafting or multiplying and perpetuating remarkable varieties or monstrosities, by the union of a young shoot from one kind of plant with the stem of another, was almost as well understood as at the present day ; it is not an art which admits of much progress or alteration ; there is but one means of securing success, and therefore, as we graft now-a-days, so did the ancient Greeks and Jews and Chinese before us. The New Testament refers to the art as practiced by the Jews ; Pliny and Virgil tell us that it was familiar to the Greeks, but no where can we trace the first discovery of what, though so common, is one of the most wonderful phenomena of nature. As to the Chinese, the first Roman Catholic missionaries who ventured to penetrate the then mysterious fastnesses of heathenism, taught them the art, and so readily did they take up the new idea thus presented to them, that very soon they excelled their teachers, just as, at the present day, they surpass all other nations in the practice of curious and unique modes of grafting shoot upon shoot, stem upon stem, until oftentimes, six or eight, ten or twelve kinds of fruit (of the same natural family of course) may be seen borne upon the same tree, all flourishing, all strong and healthful.

There is no one function of the horticulturist more impor-

tant than this ; it accomplishes the propagation of particular varieties more surely and more speedily than is possible by seed or cutting or layers, and besides this, is invaluable in hastening and increasing the fruitfulness of fruit trees. Another thing, too, when a root is still vigorous and healthy, but its stems and branches old and weak, a graft or bud near, or upon the thrifty root, will in a very short time replace the worn out branches with a new, strong, healthy growth, into which all the strength of the large root is thrown at once. The stock should always have strong roots ; about the graft or scion, it does not matter so much, though of course it is desirable that it also should be of vigorous habit, but, if it is not a healthy stock, will impart to a weak, but not diseased scion, a large portion of its own thrift and vigor. Grafting should always be performed early in the spring, when the sap is just beginning to circulate ; the grafts may be either shoots or the current year's growth, or those of several years back, and herein is one of the most marked differences between grafting and budding, for with the latter the scion must invariably be of the current season's growth, containing an embryo bud.

The stock does not change the species of the scion, but it does very much affect the quality of the fruit. A weakly stock will make small and insipid ; a vigorous one, large and fine flavored fruit.

The great art in grafting, and it requires no small degree of skill and care and patience, is to unite exactly the inner bark of the scion with the inner bark of the stock, and thus to keep them in close contact until the union is complete ; it is a more troublesome and more uncertain operation than that of budding, besides being more injurious to the stock, in case of failure, but it has the one advantage of giving a quicker and larger start to the new tree, in the event of success, for while the budded tree has but one tiny bud to start from, the grafted tree may have one or a dozen whole branches, sometimes even the entire top of a tree.

There are several methods of grafting, and to the details of these we will now proceed.

The most simple and therefore most commonly successful is that called "grafting by approach," or "inarching." For large

plants it is impracticable, but for smaller plants, one of which at least is in a box or pot, it is invaluable. The two plants, stock and scion, being brought close together; wounds are made upon each part to be grafted exactly corresponding to each other, in other words, plates of bark of equal size are removed, and the new parts thus laid bare, are bound together in close contact, with a prepared wrapping which keeps out the air. In one month (not in two weeks as in budding) if the work has been properly done union between the two will have taken place, and then all that is necessary is to cut loose the scion from its original parent and bring down its foster mother to the level of the "child of its adoption," when a new plant of the desired kind will be the result, without injury to that from which it was taken.

By this method stems, roots and branches may be united, and fruit or even flowers, be grafted upon leaves; in short "grafting by approach," is grafting *par excellence*, and affords scope for curious experiments, such as we have just indicated; experiments that any skillful and ingenious gardener may vary and multiply indefinitely.

In some cases while the junction between scion and stock is in progress, by this method, the plants are placed in moist hot-houses (not beds) or under bell glasses, and if an accumulation of too much moisture is carefully guarded against, this plan is a good one, as the union takes place more surely and expeditiously. This is the favorite method of grafting in cases where the plants in question, either stock or scion, are too rare and valuable to risk their destruction by ordinary methods in the event of failure to knit.

And next we come to "whip" or "tongue" grafting, usually practiced on small nursery trees. To perform this operation in the most perfect manner, the top of the stock, and end of the scion, should be of equal diameter, and therefore this kind of grafting unlike the others, may be done on smaller stocks. Both scion and stock must be cut obliquely as nearly at corresponding angles as is possible to get them. The best way to secure the accuracy in this respect is first to cut off the stock and then place the extremity of the scion along side and a little below the oblique

cut, to scratch the line of the latter on the scion, and then make a clean, smooth cut along the slope indicated.

Next, the tip of the stock must be cut off horizontally, and a narrow slit made, nearly in the center of the sloped face of the stock, downwards, and another corresponding one in the slope of the scion, upwards.

The tongue or wedge-like strip, which now passes the upper part of the sloped face of the scion, is not to be slipped downwards in the cleft of the stock, the inner bark of both being brought closely together on one side, so as to prevent all change of slipping out of place in tying—and this tying must be done at once tightly and neatly.

The last named operation, in grafting as in budding, is a most important item in the work, and while strips of bast matting are most commonly used, we cannot too highly recommend the employment of strong muslin, dipped in equal parts of melted tallow and beeswax.

Where these waxed strips are not used however, (and sometimes in large stocks even where they are,) grafting clay must be employed. There are several ways of preparing it: one is to beat up well together three parts of stiff yellow or blue clay, or clayey loam, with one part of horse dung, and a little chopped hay; another, that chiefly used by the French and Dutch, is to mix one half fresh cow dung with one half fresh loam.

But whether waxed strips, bast matting or grafting clay are used, every part of the wounds of stock and scion must be well and thoroughly covered, as the whole end and purpose of both clay and strips is to prevent air, rain and light from penetrating to the wounded parts.

The French method of grafting differs from ours, which is copied from the English, inasmuch as, no matter how large the stock may be, they never cut off more than the width of the scion; and as their nation excels the English as gardeners, it would, we think, be well to take the hint thus thrown out. A true born Johnny Bull scorns to accept a lesson from the despised and hated Johnny Crapaud, but not so his old time friend and ally, Uncle Sam; so, let us, Uncle Sam's children, take heed and profit.

And, in point of fact, it would seem useless as well as hurtful to inflict a larger wound than necessary upon the stock, thus giving it more work to do to heal over its cuts, just at the time when its full energies are needed, in the proper sustenance of its foster child; and therefore we would advise the adoption of the French method, and the cutting away of the major part of the stock after the graft has taken firm hold, not before.

“Cleft” grafting is next in order.

Here the head of the branch or stock is cut off obliquely and then the sloped part cut horizontally to its middle; then, with a sharp knife or chisel, which latter is best, a cleft two inches deep is made in the crown, downward, at right angles to the sloped part. Be very careful here not to injure the pith, or yours is “love’s labor lost.”

Leave the knife or chisel placed horizontally in the base of the cleft to keep it open, and take up your scion; now with a sharp knife shape its extremity for an inch and a half in the shape of a wedge, leaving it about an eighth of an inch thicker on the outer or bark side, and bringing it to a finer edge on the inner side; and now you are all ready to slip your scion down into the cleft as deep as the wedge you have cut—one and a half inches—this done, with the thicker or bark edge placed very carefully even with the inner bark of the stock, draw out your knife from the cleft below it, and you will be surprised to see how closely and firmly the scion is held. Two or three scions may be inserted in this way into the same stock, in separate clefts, the whole being tightly wrapped and closed up.

“Crown” grafting is employed chiefly on thick stocks, long branches shortened, or headed down trees, and as many as a dozen scions may be used if desired.

First, you saw off the head of stock or branch as level as may be, and pare the surface smooth; then cut one side of your scions flat and sloping, one and a half inches long, making a little horizontal cut or shoulder at the top, to rest on the crown of the stock.

Your scions ready, slip a thin blade or the ivory handle of a budding knife about two inches downward, between the bark and

wood at the top of the stock, pass it gently around the latter, withdraw it, and thrust in its place your scions, one after the other, their number being limited, if you like, only by the size of the stock, till they stand up like a crown around the top of the stake, their little shoulders resting on the level surface for support.

And now the inevitable wrapping, and the operation is completed, "for better or for worse," as a month will tell.

Yet another method of grafting is there, termed "side grafting." This is often also called "tongue grafting," and differs only from "whip" or "tongue grafting" proper, in being performed on the side of a tree instead of on the top of a cut down stock. Where a valuable tree has lost a branch from any cause, as often happens, and an ugly, lopsided appearance is the result, "side grafting" is resorted to to supply the deficiency.

Having selected the spot where you wish a new branch, you pare off the bark and a little of the wood, cut the scions to fit as nearly as possible, and wrap them closely together.

In all these various modes of grafting, while their success or failure will be evident within a month by the aspect of the buds on the scion, yet it is not safe, if good fortune has attended your efforts, to remove the wrapping or clay for at least three months, until the graft be completely healed over, and even then the removal should be gradual.

In some cases, to be determined by the judgment of the operator, a ligature around the graft, or a stake to which the young shoots of the scion should be tied, may be advisable for a year or more, and often a bandage of moss wrapped lightly around the point of junction will be of great advantage in retaining moisture, and warding off the hot rays of the sun, until the wounds are completely healed over.

There is still one more mode of grafting, which may aptly be termed a "cross" between it and budding.

This is called "flute grafting," and consists in taking a ring of bark, with several buds on it, cutting away a corresponding ring from the stock and putting in its place the scion ring, so that the edges of the bark equally join. This must be done in the spring, when the bark parts most readily, and is the surest of all

modes of grafting because it so nearly approaches budding, pure and simple.

In grafting it is always better to take the scion from the lateral branches, because more fruitful, and also to remove them from the tree several days before using, that the sap may partly dry out, leaving place for the sap from the stock to enter more freely.

CHAPTER V.

WHERE TO PLANT.

And now, having brought up our young trees to a point where they are ready for setting out, let us consider the best location for their permanent home, where their life work may be most perfectly accomplished.

At the very outset, it becomes a mooted question whether to locate the grove in pine land or hammock.

Some growers advocate the one, some the other, but the fact is, that as time rolls on and brings further experience in this new calling of orange culture, the friends of the pine land groves are becoming more and more numerous.

Until very recently, there was one point on which both cliques were in accord, and this was, that the orange tree would not flourish on low lands, but that a high, dry location was imperative.

But now, several well known reliable growers have come to the front, to prove that orange trees will do, have done, and are doing well on low hammock, and on low flat woods; that they grow as thrifty, bear as profusely, and their fruit stands shipping as well as though the trees were set on the high lands.

One of these growers, Mr. E. H. Hart, of Federal Point, Florida, gives it as his opinion, based on the experience of years, that "the crusade against low lands for the orange, is an arrant humbug that ought to have been exploded long ago. It has been kept up chiefly by those having high lands to sell, and by persons, who living upon land of a different character knew no better."

The gentleman referred to has for twelve years successfully raised and cultivated a large grove on just such land as has been condemned heretofore as absolutely worthless for orange culture; flat pine woods, with clay and hard-pan only eighteen inches from the surface.

In very rainy weather the soil becomes so saturated with

water, that it fills up and runs over into the furrows and ditches prepared to carry off the surplus moisture; yet in defiance of this and of the "croakers" who declared the trees would die as soon as their tap roots reached the hard-pan; Mr. Hart's grove is to-day one of the finest in the State, although, as he says, "on several occasions the river (St. John's) rose to an unusual height, and stood for several weeks a foot or more deep, in the lower parts of my grove, the higher ground being also completely soaked, by reason of no drainage. So far from suffering injury, the trees appeared rather benefited by the irrigation."

Also this same orange grower, having ditched his grove afterwards, decided that a simple, shallow furrow was all that was needful.

In Sardinia there is a famous grove, a square mile in extent, where a stream of water running through the center, is employed to lay the whole grove under water every two weeks, all through the summer.

Now, here are well authenticated instances going to prove that the orange is more "given to drink" than used to be believed, and that they will grow on low lands if properly looked after; and by "properly" we mean that in planting, the trees should be set a little higher than the surrounding land, and that shallow ditches or furrows, a hundred feet apart, should be run through the grove.

Therefore, we would not advise the settler to select "flat-woods" for a grove, other things being equal, yet if such lands offer decided advantages, as to price, location as to transit lines, society and health, over other lands offered in the desired vicinity, we would say, "take them, set you trees high, furrow your grove, to lead off superfluous waters; put out a few *Eucalyptus Globulus* trees here and there, and have no fears of the result."

The orange tree is a good deal of a cosmopolitan, and will flourish in a variety of soils, in clay, sand, shell or loamy soils; in low or high hammocks; in pine land, or black-jack lands; very much depends on the treatment they receive; but when it is as easy to obtain pine land or high hammock, they are to be pre-

ferred, as given equal, or even better results than the others, with less labor.

Given two tracts of land, one hammock, the other good pine, at equal cost, and equal advantages in all other respects, many would doubtless select the former.

But we, with the experience gained by some years residence in Florida, would select the pine land for a permanently satisfactory grove.

Undoubtedly, the hammocks are the richest lands at the start, but their fertility is deceptive; that is, it is not lasting; trees and vegetables grow finely for several years, but the fertility given to the soil by the once falling leaves of the deciduous undergrowth (cut away to make room for cultivation) is soon exhausted, and after that every year increases the need of fertilizers in the hammock groves.

But with pine lands it is just the reverse, they are poorer at the outset, but improve steadily with each year's cultivation.

Pine land, with clay subsoil, is rapidly coming more and more into favor; as the best possible basis to work upon, it has "bottom" on which one can depend to retain all surplus fertilizers, until the trees can utilize them.

When you can find clay subsoil anywhere from one to four feet from the surface, there be not afraid to locate you grove.

It is not always safe to depend on surface indications, or the reports of others; the most trustworthy plan is to take a spade yourself, and dig here and there on the land you propose to use for your grove; and thus avoid the possible application of the fable of "The Lark and her young ones."

We have never yet met an orange grower whose trees were located on good pine, with clay a few feet below the surface, who was not thoroughly satisfied with the progress of his grove.

Then the hammock land is much more expensive than the pine; when the latter can be had of the best quality from ten to twenty dollars an acre, the former is held from fifty to seventy-five, or even one hundred dollars.

The expense of clearing the land preparatory to cultivation must also be taken into account. The hammock land is full of

under-brush, young trees, roots, vines and palmetto ; all these must not only be cut down, and either be burned, or piled up to decay, and furnish by and by nourishing food for the future grove, but the numberless roots must also be grubbed up at no light expenditure of time and money, time, if the settler is a strong man, able and willing to work ; money, if he has to hire the clearing done for him.

It does not cost less than forty or fifty dollars to clear an acre of hammock land, as it should be cleared, and for a year or two afterward the fight against the upspringing roots must be waged unceasingly, or the cleaning will go back to its original state, and all the time and money already expended be thrown away.

In clearing a piece of hammock for a grove, it is only the undergrowth that should be got rid of entirely, nearly, if not all of the grand old live-oak trees should be left standing to flourish as of old, before civilization had dreamed of intruding upon their time-honored domains.

This is a very important point, in the well being of the grove, especially in one formed by budding a former "wild grove."

It should be remembered that these trees have grown up from earliest infancy to maturity beneath the protecting shelter of these giant oaks, whose wide stretching arms, heavily draped with moss, ward off the high winds, frosts, and the fierce heat of the mid-day sun; alter these conditions by cutting down all the protecting oaks, the "Orange Guard" they may well be called ; and you at once give the trees, it is your interest to care for, such a shock as they will never recover from, and expose them to hardships, such as they never encountered before.

The thriftiest young groves in the State have been grown under just such shelter as the great oaks delight to bestow upon them.

The value of these "Orange Guards" was thoroughly demonstrated two years ago, when groves supposed to be too far South, or too well shielded by water protection to be imperiled by frost, were severely damaged, and some of the trees killed to the ground by a sudden nocturnal visit from erratic "Jack Frost."

These groves were not sheltered by overhanging trees, but further north by many miles was a far-famed grove on Orange Lake, that was thus guarded ; and adjoining it another, wherein all the trees had been cut down.

When that disastrous frost came, the latter grove looked as if a fire had swept through it, the trees being stripped of their leaves, and thousands of dollars worth of fruit lying under them; while the former was totally uninjured, its leaves as green as in midsummer, its fruit untouched.

The owner of the unsheltered grove now declares that he would gladly give twenty thousand dollars for a few of the stately forest trees, that once sheltered his domesticated wild grove.

We have said enough to demonstrate the importance of this point, so will pass on to the consideration of pine land suitable for orange culture.

The growth of timber on these lands is, as its name denotes, chiefly pine, with here and there, small oaks, shrubs, wild persimmons, hickory, and a few other trees, sometimes solitary, but more frequently in groups : and where the latter occurs, it is called "scrub hammock."

The rule is, that where tall, straight pine trees are found, large in size, and about seventy to the acre, and no undergrowth, except the wire-grass, may be so termed, the land is of the first-class; where the small oak trees are scattered thinly about, it is second-class, and where the oaks surpass the pines in number, it is less desirable, being inferior to the others.

There is something to be said however, even for this; it is very poor at first, it is true, but it responds very quickly to fertilizers, and even the poorest of it can be brought to a high degree of cultivation, and thereafter continually improves year by year.

There is only one way of clearing hammock land, and that we have mentioned ; there are, however several ways of preparing pine land for a grove.

One way is to girdle the trees, which deadens them, and puts an immediate stop to the great drain of their wide spreading roots upon the plant food lying latent in the ground.

The trees thus girdled are left standing, and then the land is ready for fencing and ploughing; in a few months the dead limbs begin to fall, and so continue for several years, and the branches must either be carried away from time to time, or else allowed to remain where they fall to be an eye-sore and a constant annoyance in cultivation.

The first cost of this method of clearing is very little, only about two dollars per acre or less, but it is a very unsatisfactory way, and likely to cost more in the end than it saved in the beginning.

After a few years time, when the orange grove is fully under way, the deadened trees will begin to fall during a heavy rain or a high wind, or often without these provocations; down they crash, now here, now there, and as they are not remarkable for good judgment, they are just as likely as not to come down on an orange tree, and put it beyond the pale of recognition.

And then the fallen giant must be chopped up and either hauled away or burned; the expense and trouble of doing which now are just as great as they would have been at first, plus the loss of some of your best orange trees.

The claim made that the dropping branches, bark and sap of the pine trees left to decay on the ground, furnish a valuable fertilizer, is a specious one, and even if one is willing to have his grove strewn over with branches that trip up his horse and interfere with the plow, the amount of gain to the soil is so small that a few cart-loads of rotten sap and grass hauled from outside and spread around the orange trees would far surpass it.

Altogether we cannot recommend this method, for we do not think the gain, even considering the small first cost at all commensurate with the "after-claps" of falling pines, smashed orange trees and the inevitable final clearing up of trash.

Another, and better way, is to hew down the trees, have rails split from all that are suitable for the purpose, then pile and burn the remnants; this method costs for the clearing, from twelve to eighteen dollars an acre, according to the number of trees to be disposed of and the amount of "small deer" in the shape of small bushes, and young oaks to be grubbed up by the roots.

But then the stumps of the pine trees remain in the ground, and it is a sad mistake to leave them there, as so many do ; they are not only a constant eye-sore (that is the least of the objections) but no matter how often and how carefully the land is cultivated, these stumps scattered all over it, will harbor ants and weeds, especially that curse of a cultivated field in the South called "maiden cane" grass, which it is almost impossible to eradicate, once it is established, its roots run down to a depth of several feet, and every joint makes a new plant ; for this enemy the pine stumps afford first-class rallying points ; it is simply impossible to destroy it in a field where they are.

And even if the maiden-cane can be kept at bay, as the orange trees grow larger, the pine stumps encroach upon the space they require, and by this time, when it is at least deemed advisable to get rid of them, fully one-half will have to be chopped out laboriously, because the orange trees near them would be injured if they were burned out.

Better, by far burn them out in the first place, and have your land smooth and clean, and no broken or crooked lines among your orange rows, because of stumps interfering with setting them out in their proper places.

It will cost you fifteen or twenty cents apiece to do this, but it is cheaper in the end.

A still better method, because cheaper and just as effective, is one that is more rarely practiced than the other two, only because it is newer, and not generally known as yet in Florida.

This is to dig a hole quite deep against one side of the pine tree, cutting off the large roots there and laying bare the tap root, and then build a fire in the hole beneath, and against the tree ; by keeping the fire constantly smouldering, and in contact with the tap roop, the latter is burned off, and the tree, having thus lost its balance, topples over and comes crashing to the ground all at one time, and it only remains to burn the tree, fill up the hole, and the land is clear and smooth, ready for the plow for all time to come ; no falling branches or trees, no weed-gathering stumps.

This method of clearing costs from twenty to thirty dollars

an acre, not so much indeed, as just cutting and burning the trees, and then having the stumps burned out.

The land cleared, plowing is next in order ; this can be done at an expense of three dollars an acre, not a high charge for breaking new land, as it is no easy, or quick work, even in our light Florida soil.

Rails for fencing are split from the pine trees at a cost of a dollar a hundred, and it is well to have them split before the trees are burned, as among those cut down would be many suitable for the purpose.

Hauling the rails and building the fence (Virginia worm fence is the rule) will cost fifty cents a hundred; the total cost of inclosing one acre, eleven hundred rails, will amount to sixteen dollars and fifty cents: of five acres, between forty and fifty dollars.

But however much or little the land may be cleared for a grove, or whether pine or hammock be selected, it should invariably be located near some assured and permanent transportation facilities, either in the present or the near future, when the grove will have "come into profit."

When groves are twenty or more miles from an outlet, and some very fine groves are thus situated, the hauling by wagon is expensive and tedious, and the cause of great loss by bruising the fruit, so as to render it unfit for market.

Also do not go too far north in the State, thinking that all places are equally favored for orange culture; it is best not to venture beyond the twenty-ninth degree.

A good deal has been said and written about water protection, and there is no doubt that a location near to, and south of west of one of our large lakes is desirable.

But the vicinity of the water does not always ward off frost: it all depends upon how the frost approaches.

A warm vapor always hangs over a large body of water, and if a cold north or north-west wind comes rushing across the placid bosom of the lake, it has force sufficient to carry this warm vapor on with it, and by the time the south shore is reached

the captive air has raised the temperature of its captor by several degrees, so that its frosty quality is lost.

But if the cold wave comes quietly and by stealth, as it were, and creeps slowly over the water, it chills the warm vapor and so reaches the south as cold as when it left the north shore.

Besides this, it has been clearly proved that frost, like wind storms, travels in streaks, often with clearly defined margins, so that a grove that may escape one frost may be touched by another less severe, apparently "without rhyme or reason."

And so, after all the best protection a grove can have is from a belt of timber land, either inclosing it entirely, or else guarding it on the north or west, since these are the quarters whence come the highest and coldest winds.

This is a shield that can happily be obtained in almost any locality in Florida, for nearly every settler takes his land at first or second hand, and forest land still predominates throughout the State; nowhere do we find immense contiguous tracts of land all cleared and under tillage as in the older settled States.

CHAPTER VI.

BUDDED TREES OR SEEDLINGS?

The former, most emphatically.

Time was, and that only a few years ago too, when the majority of growers favored the seedling tree, because it was said to grow larger, fruit more prolifically, and bear longer than the budded tree.

But the tide of opinion has decidedly veered around now-a-days, as a greater degree of experience is gained and fuller scientific investigation brought to bear on the mooted question.

Thomas Meehan, editor of the *Gardner's Monthly and Horticulturist*, of Philadelphia, who is one of the recognized authorities on horticultural matters in the United States, tells us most decidedly, that budding orange trees does not dwarf them in the least, unless a dwarf scion is used, and this opinion, coming from such a source, should carry conviction with it, even if there were no other available testimony, of which, however, there is plenty. It is impossible to understand the foundation upon which the theory has been based, that by budding we sacrifice size of tree and quality of fruit, for certainly experience does not demonstrate either of these charges. In the first place budding orange trees is comparatively a new thing with us all, while seedling trees date back for many years. Where a fair comparison between the trees is attainable, it is proved that the budded trees are fully as large as the seedlings of the same age.

There is one thing that has probably misled many superficial observers in this connection, and that is, that trees that bear early and continuously, as budded trees do bear, do not increase so rapidly in wood, year for year, as the tree's whole energy is devoted to making wood, but until the budded tree has become as large as a seedling bearing tree, and it will be seen that the after growth of the budded tree surpasses that of the seedling.

Captain Burnham, of Indian River, tells us that his trees are nearly all budded, except a few seedlings scattered here and

there in his grove, and these latter are decidedly smaller and less thrifty trees, though of the same age.

In fact, the further one goes into the subject, the more majestically does the once maligned budded tree loom up and the seedling retire into the back-ground to be brought forward again simply as stock, in which character we have no word to say against them.

Seedlings versus budded trees? Why, the seedlings have no case at all. It has been proven that it does not grow larger or bear more fruit than the budded tree, and when we look at the question financially its case is more hopeless than ever.

Why is it that we dig and delve and toil to make an orange grove? Truly, that it may return our labor in good solid coin, and that as soon as may be.

Did any one ever hear of a tree budded from a bearing one that did not fruit until it was eight, ten, twenty years from the bud? Yet the two first dates named are those the seedlings usually attain before they bear at all, while it is not uncommon for them to reach the age of fifteen and twenty years before bearing a single orange, and sometimes they are forever barren. Very few settlers there are, even with very limited means, who could not struggle along somehow, if their trees could be made to yield a small return in four or five years, but who, if compelled to wait a return for ten or twelve years, would fall down worsted in the fight and suffer a financial shipwreck. In short, as a well-known orange grower emphatically asserts:

"It is universally recognized that budding shortens the period before fruiting. Is not this, then, a strong reason financially, why we should adopt the budded system? My own experience teaches me the necessity of budding. I can see no dwarfing tendency or results; on the contrary, my budded trees are larger than seedlings of the same age, and the fruit is certainly as good. I have not been able to see that the production is fewer in numbers. I therefore give my unqualified opinion that it will not only pay to bud the orange tree, but that as intelligent men we cannot afford to do otherwise.

There is also another strong argument in favor of budded

trees that we have not yet touched on. Years of experience have taught every horticulturist that the attempt to produce certain varieties of fruit from seed almost invariably results in failure. The seed either produces an inferior fruit, or an entirely new variety, which once in a great while is a better article obtained than that which produced the seed, and before the result can be attained years of care and waiting must elapse. Every grower who has carefully observed the fruit produced by the various trees in a seedling grove cannot have failed to notice a great difference therein. Let the seeds that produced these trees have been ever so carefully selected, some of the trees will produce better oranges than others with the same care and treatment.

Now, this is not the case with budded trees.

From the moment the first tiny little leaf starts out the germ of the future tree, its destined work is marked out and known. If a bud from a bearing Mediterranean Sweet, Navel, Homosassa, or Mandarin, is used, then we know what the budded tree will bear, and thus we not only secure beyond doubt a fine variety of fruit, but the identical variety we have selected as preferable. Surely this one advantage alone should be sufficient to tip the scale in favor of the budded tree. It is no slight thing to know for a certainty that, after several years' expenditure of care, money and patience, we have secured the most desirable varieties of fruit.

Not many years since the sour orange was the favorite for budding stock; of late, however, the scarcity of this tree has led to experiments which tend to prove that there are several kinds of stock to be preferred to the sour orange. There are several strong objections to this wild stock from the hammocks. First—and this is a very important matter—it is almost impossible to secure a sufficient quantity of roots in comparison to the size of the trunk; again, they have grown up from seed to maturity in rich land, protected from sun and wind by the dense foliage around them, and when they are transplanted to a grove they suffer from change of habit. If they live at all, their growth is feeble and sickly. They will put out, perhaps, a few sprouts,

and then stand still for months, or even years, the vitality of the trunk being exhausted and the roots not having sufficient life to supply further nutriment.

As an example, we give an instance of our own personal experience: Five years ago we set out a grove of sour stocks, taken from the hammock—to be budded in due time—on pine land, at an expense of one dollar each. A few of the transplanted stumps died almost immediately. The others lingered on, just alive, most of them too feeble to take a bud. After two years of lost time and patience, the majority were pulled up and thrown away, to be replaced by thrifty budded trees from the nursery. This year still more have been dug out in disgrace, while the few stumps that nourished their foster children, the sweet buds, are only now, after four years, beginning to make a respectable growth.

Had these sour stumps been stock of the proper kind, they would have grown right along and accepted the bud in due time. The grove then set out would now have been a bearing one, beginning to pay back the money, care and time expended on it. As it is, four years are totally lost. So much for setting out the wrong kind of stock.

The stock that is now coming into competition with the once universal sour orange, are lemon, lime, grape-fruit, and the sweet seedling.

The three former are stronger growing trees than the latter, but this also is as thrifty as need be, and is becoming a great favorite with many growers.

One of Florida's foremost nurserymen, Mr. A. G. Beach, of Palatka, takes a decided stand in favor of the sweet seedling for stocks; especially, because in the event of a repetition of the frost of 1835, that killed orange trees to the ground, the sweet seedling sprouting from the ground would still bear a sweet orange without requiring to be again budded; supposing, of course, that its roots had attained a bearing age.

But what then? The fruit would still be only a seedling orange, of no special variety, and more likely poor than good; so that

budding would be just as desirable, for the same reasons, as it was at first.

Consequently, while we acknowledge the sweet seedling to be good stock, we cannot admit that it would not require rebudding, the same as any other, in the event of its being killed to the ground.

In consequence, the sweet seedling is preferred to any other stock, it having been shown by various experiments that it is the safest for the orange and lemon buds. Its roots are large, strong and healthy, and intended by nature to minister to the needs of a large, majestic tree.

It is rarely affected by the gum or any other root disease, and both orange and lemon buds have a close and strong affinity for this stock. The lemon also does well as stock for the orange, although some claim that here, as well as with the lime and citron, the stock exercises an influence upon the fruit, and it is apt to be coarse, flavored with a pungent acid flavor. These same growers admit, however, that the sweet orange, raised on lime, citron and lemon stock, is of larger size and in greater quantity than that raised from the orange stock.

Of all the stocks named, the citron enjoys the least favor, and we think, deservedly so.

The lemon seedling is a good thrifty grower, but will not thrive in so great a diversity of soil and situation as the others. The lime makes a strong, rapid stock, and will flourish with less care and in poorer soil than any of the others. Owing to its rather dwarfish habit, it would be better to bud it with one of the half dwarf varieties of the orange—such as the St. Michael or Mandarin—thus avoiding the danger of the top out-growing the trunk.

The size and quantity of fruit borne on lime and lemon stock is largely increased over the original, but it is claimed by some that the quality is rather deteriorated.

As, however, it has been proven by our most eminent botanists, that the stock does not in any way influence the character of the fruit borne by the scion, except in so far as a thrifty stock makes a thrifty tree, and *vice versa*, we cannot but believe the

asserted effect of the lime and lemon on the orange as fanciful and not sustained by fact.

The grape fruit germinates as readily from the seed as the sour orange and grows off as vigorously from the very first. It is as hardy as the sweet orange, is less subject to disease, and makes an excellent stock for the latter.

In budding one's own nursery-raised seedlings, no matter what the stock may be, it is best to bud them in the nursery when the stock is one year old ; then, as soon as the bud shows it has taken, take up the trees carefully and set them out in the grove, where they are to remain, for when you have your trees at hand it is better to get them out as young as possible while the roots are so small that it is easy to take them up without losing any, and thereby giving the tree a set-back.

Do not cut back entirely until the transplanted tree has had time to grow. If all the trees in the nursery are not needed for budding at the same time, it is a good plan to bud alternate trees.

Those that remain will have a space of two feet in which to grow another year, or the space thus left vacant may be filled in again with fresh stock from the seed bed.

In buying from the nurseries, and this we would advise all to do who have not their own nursery, it is best to purchase stock three years old and one year bud. These trees are of a size that renders them easy to handle and set out and they grow off finely, being neither too old to lose many rootlets in the process of transfer, nor too young to bear a temporary cessation of growth.

Trees such as these, of the best varieties grown, are to be had at fifty dollars per hundred ; trees of two years' bud, with stock of four or five years' growth, at seventy-five dollars ; and a still larger size at one dollar each. When the sweet seedling is purchased for setting out in a grove, it should be not under three nor over five years for the best result to be obtained.

Setting them out from your home nursery, it is better to put them out just as soon as they are a year old, putting stakes to protect them from the plow and cultivator until they are large enough to take care of themselves. This precaution is, of course, necessary with the young budded trees as well.

CHAPTER VII.

HOW TO PLANT.

The last thing before you are ready to set out your grove, is to have the ground thoroughly ploughed (this should not be the first time, however), for it is not well to plant trees in freshly ploughed land, as the soil is always more or less sour, and needs sun and air to sweeten it.

If it is practicable to break up the land for the future grove several months before setting out the trees, and to plant and turn under a crop of cow-peas, with, or even without a light sprinkling of lime, so much the better, although this is not absolutely necessary.

The ground thus prepared, the next thing in order is to lay it out in grove form.

Supposing that your fences lay at right angles with each other, as they should do, this will not be a very difficult matter; measuring the distance you wish the first row to be from a parallel fence, first at one end and then at the other of the proposed line, stretch a rope (or wire preferred) from a stake driven down at the point of measurement at one end, and to its corresponding stake at the other.

Before this is done, however, tags at the desired distance apart should have been tied to rope, or wire, in such manner as to preclude their slipping out of place.

Now, keeping your measuring cord tight, close down to a stake at each of these tags; these mark the position of the tap root of the tree. Now, whatever space you have chosen for your trees to set apart, as just staked out, whether twenty, twenty-five or thirty feet, measure this distance at a right angle for your first row, at each end; remove your measuring line to these new points of departure, and drive down your stakes to mark the tags as before; this gives the second row of trees. By adopting

this simple and easy mode of measurement, crooked and irregular rows are avoided, and the grove thus laid out will present a regular and pleasing effect to the eye, and be much more easily cultivated than one whose trees are set here and there, irregular in distance and in line.

The plow or cultivator can run much closer to trees that are set in a straight line, and very little work is left to be done by the hoe.

There is great diversity of opinion as to the proper distance to set apart orange trees, and yet it is a question of vital importance. We do not set out our groves for ourselves alone, but for our posterity also for generations to come. We should, therefore, bring our best judgment to bear upon a permanent arrangement for the position of the trees. He who successfully brings to maturity a grove of orange or lemon trees is preparing a noble heritage for his heirs, and his work should be well and carefully done.

The trees look small and puny when first set out, but do not forget that they are put there to stay, and that for years to come they will continue to increase constantly in size, until by-and-by the day will come when each of those trees will be forty or fifty feet high, with a trunk which two men with outstretched arms cannot entirely encircle, and with a fruitage of from five to ten thousand oranges.

It seems incredible, does it not, that these little trees, many of them no thicker than your finger, should ever attain such a size? Yet others have done it, and these will do it in time; not in ours, perhaps, but in that of our children and our children's children.

If the trees are planted too close, the grove will be dwarfed and almost wrecked, as the years roll on, until some day it will become imperative to remove a part of the trees, and unless this is done with regularity and the alternate trees taken out, the effect will not be satisfactory, and the whole symmetry of the grove destroyed, to say nothing of the loss of half the fruit for many years.

There are two budded groves not a mile from the writer at this present moment, where ten or twelve years ago little

trees were set out fifteen feet apart. To-day, many large bearing trees have had to be removed, and their profit lost for years to come, while in the other the sun never reaches the ground, and rain, only as it drops from and through the branches that closely interlock and dwarf each other. Until the alternate trees in this grove are removed it will never do half as well as if the trees had at first been placed at a proper distance apart. It will not be long before the owner of that grove will be compelled to thin out his trees.

Another grove, too, we know of, where the wild trees, budded where they stood, twelve years ago, are now crowding each other to such an extent, that the owners are about to remove a large number, although doing so will entail a loss of several hundred boxes for several years to come.

Now, these are things that "try men's souls," yet they have to be done, sooner or later, when the grove is originally set too close; hence the importance of judicious spacing when first planting. There are still a few growers who recommend planting in squares of fifteen or eighteen feet, but many have gone to the other extreme, and advocate squares of thirty feet, or even forty feet.

The great majority, however, have paused half way, and consider from twenty to twenty-five feet the best spacing for the orange or lemon grove, and undoubtedly they are in the right. Such a distance apart gives the trees ample room to spread and yet wastes neither land nor labor. When there is, or likely to be, superabundant moisture, plant the trees twenty-five feet, to give the sun a better chance to reach the ground. On high lands, set your trees at twenty feet. And now, the ground prepared and spaced off, you are ready to dig your holes. The depth and diameter of these will depend on the size of your trees. Give plenty of room, and do not crowd the roots, or curl them up. Throw the top soil to one side, the sub-soil to another; if you have well-rotted stable manure, compost, muck, or commercial fertilizer ready, mix it sparingly, half with the sub-soil, half with the top.

The removal of the tree from the nursery to the grove is not the simple thing many conceive it to be—that is, if it be properly

done. Let your trees be improperly handled whilst being dug and set out, and if they grow at all, it will be a sickly, stunted growth, that will be a perpetual reminder to their owners of the old and truthful adage, "whatever is worth doing, is worth doing well."

The work of taking up and transplanting trees whose roots are chiefly fibrous, like those of the citric family, is one requiring time, care and patience. Don't try to do too much at one time, or you will repent it.

In digging trees, preserve every root and rootlet that is possible, if they are to be carried to any distance, or kept for several days out of the ground. It will pay well to puddle the roots—in other words, dip them in a paste made of clay and sand, made just thin enough to let the finest rootlets be plunged in it without breaking, and yet thick enough to cling to them like a close fitting garment. Roots thus protected, put away in a shady place, and watered so that they do not get dry, will keep in good order for two or three days.

Under no circumstances must the tender rootlets of the citrus family be permitted to dry off during the interval between digging and planting, for being evergreens, they dry off very quickly, and nothing can ever revive them again. Never let the sun touch them.

In packing for shipment the roots should be thoroughly enveloped in damp moss, straw, or grass, and in conveying in wagons, even a short distance, damp Florida moss should be thrown over them. Take them from under this shelter one by one, as you are ready to plant them; never drop them ahead of the workmen.

The soil should be damp, both when the trees are taken from the nursery and when they are set out. If, in ordering them from a distance, they arrive in a dry time, place the roots in water for twelve hours before planting, and use water freely when setting them out.

In planting, the hole should be slightly raised in the center, sloping downward toward the sides; then, with a small spade or

a pointed stick, make a hole in the middle of the mound for the tap-root, and just here is an important item.

The tap-root—it does no harm if it is cut partially away—should rest in the hole thus prepared for it, to such a depth as will bring the top lateral roots of the tree about an inch above the ground after the soil is all filled in around the tree.

Too much caution cannot be exercised about this, for if the tree is set too deep, it will be a long while, perhaps years, before it will flourish, for it will be compelled to send out fresh surface roots to take the place of those so carelessly smothered from the air and warmth by too deep planting.

Remember that freshly plowed land is always raised several inches above its general level, and also that trees always settle after being planted from one to two inches, according to their weight. Therefore, let the upper roots, where they stand out from the stem, be in full view after your work is done, then you are assured it is well done.

Before the tree is placed in the hole, trim off with a sharp knife all the bruised or broken roots and cut back the tree severely, then push the tap-root down into the hole prepared for it, pack the top earth you have thrown out around it, spread out the lower layer of lateral and fibrous roots, holding out of the way the upper roots, pack down the soil firmly on them with your hands, spread out the upper layers and pack the earth firmly on them with your feet, pour on a half pail of water, when that has had time to settle, spread the sub-soil around the tree and level off the ground, and that completes the operation.

A day or two after the trees are set out, examine them and see if any of them need straightening, also if any of the holes need more filling. Trees should be pruned a week or two before removal from the nursery to enable them to recover from the shock that is always attendant upon severe pruning. For at least several months after planting the trees should be mulched, in order to prevent the possibility of the upper rootlets becoming dry before they have had time to establish themselves in their new quarters.

We may have seemed tedious and unnecessarily minute in

treating of this matter of "how to plant," but the experience of all orange growers teaches that the most critical period in the life of the tree is that in which it is moved from the nursery to the grove, and in the manner in which that is done depends its after career for better or worse.

The following table will be found convenient for reference in laying out a grove and in ordering trees :

NUMBER OF TREES IN SQUARES PER ACRE.

20x20 feet.....	108 trees.
25x25 "	70 "
30x30 "	48 "
33x35 "	35 "

CHAPTER VIII.

HOW TO CULTIVATE.

Under this heading we come to the most vexed question among the many that perplex the orange grower. Doubtless twenty years ago, before orange culture became an established industry, the few men who counted a small number of thick trees among their possessions, deemed that they knew all about their culture.

But now-a-days the orange grower is fain to confess that there is much yet to learn in his business, and that time and experience are still required before the best results can be certainly obtained.

One lesson, at least, has been brought home to every orange grower, and it is one that all new-comers should heed, since second-hand experience is cheaper than that paid for out of one's own pocket, and this is, that when an orange grove is the Alpha and Omega, the sinew and back-bone, of a Florida home, it must be treated as such.

Who would think of embarking in any commercial business, stocking one's store, for instance, and then going off here and there, leaving the business to take care of itself and the stock at the mercy of thieves?

Yet such a course would be quite as sensible as that pursued by those who set out an orange grove, and then leave it uncared for, save, perhaps, by a semi-occasional plowing; which is given more in the interest of corn, cow-peas, or some such crop planted among the trees, than in that of the latter themselves.

Those who have bought their experience personally have waked up by-and-by to the fact that all the time spent in waiting for the trees to take a start while being treated in this shabby manner, is just so much time lost.

The orange will bear a great deal of harsh treatment and neglect, without actually dying, but it will not thrive, nor come quickly into profit, unless it is carefully tended and nurtured, just as one would look after any other business that he expected to be profitable, or to become his future support.

But as we have just said, how best to accomplish this desirable result, is a much vexed question, for the calling, being a comparatively new one, there are almost as many systems put forward as there are orange growers; and between them all, the newcomer cannot but become bewildered and confused.

A great deal may be learned by comparing methods and results in one's own neighborhood, finding out who has failed and who has succeeded, and the cause which led to each result, and then guiding one's own course accordingly.

The advocates of scant cultivation, once a numerous body, are becoming fewer and fewer, as time proves that there is no tree or plant that will respond more generously than the orange to thorough cultivation.

"Let the weeds and grass grow in the grove and plow them under two or three times in the course of the season," used to be the text preached to the novice and practiced by the old system grower.

This is the plan still followed by some, but the majority have come to the belief that the plow should not be allowed at all in a grove that is bearing or nearly approaching it, for by this time the ground will be closely matted with roots thrown out by the trees, and as the majority of these are surface roots, the plow will tear and loose them, and thus by the old method, "two or three times in a season," the trees were rudely deprived of a portion of their food caterers, and their growth checked, while Dame Nature paused to replace the fibrous roots thus torn away.

So the turn-plow should be banished from the bearing grove, and in fact, from every grove, after the trees are half-grown, and a single thirty-two inch sweep used in its place.

Many use the cultivator and harrow, but the sweep is better than either. It is more uniform in its depth of cutting than

either the plow, cultivator or harrow. It cuts off weeds under ground better than the two latter, and taken altogether, it does better and cheaper work in a grove free from stumps, and better than any other implement we know of.

The ground throughout the grove should be kept level, and the surface stirred with sweep or cultivator every two weeks, to a depth of no more than three inches, as far out as the roots have extended. Each time the cultivator or harrow passes through the grove it should be followed by the hoe, not only to cut down all grass and weeds, but to draw any soil that may have been thrown against the trunks of the trees, or piled up on top of the crown of the lateral surface roots.

We have in a previous chapter referred to the importance of allowing the crown of these roots to be level with, or slightly above the surface of the ground, and now refer to it again because it is a point, the why and wherefore of which is but little understood or heeded, even by those growers who are esteemed most intelligent and wide awake to the best methods of culture.

If the crown of these laterals is left a little above the soil when the young tree is set out, as nature intended it to be, they will develop very rapidly, and as these are the main channels for conveying food and drink to the inner parts of the tree, the importance of this point is readily seen.

It is exactly on the same principle that we draw away the earth from around an onion to hasten the growth of the bulb, and everywhere among the forest trees we see Dame Nature employing this method to brace and strengthen their growth.

As a general rule, clean culture gives the best results, where the ground is dry and rolling. When it is low and damp, allowing it to grow, cutting in once or twice in the season, and leaving it to decay on the surface, is the better plan.

The former is the best for new pine lands, the latter for wild hammock groves, although circumstances may, in individual cases, modify these rules, but, generally, they hold good.

We know of a pine land grove, where for several years grass was allowed to grow, and three or four times in a season

plowed under, the trees did not grow well, or bear well. They became sickly, insected, and the oranges rusted. Then clean culture was tried, and a cultivator passed through the grove every two weeks, from January to October. It was curious to see how those trees brightened up under what was evidently congenial treatment.

Before one season was over they started to grow vigorously, throwing out thrifty shoots from top to bottom, the insects disappeared, the trees lost their sickly yellow look, and joyously donned their wonted dark green livery, and the fruit was large and fine and bright.

Another instance we know: a wild hammock grove, where clean culture was practiced for several seasons, the trees, hitherto healthy and in vigorous growth, drooped, turned yellow, became the prey of insects, dropped their oranges, and seemed likely to die. Then the owner stopped plowing and cultivating, allowed the luxuriant grass to grow at will, and when it became too rampant, had it cut and left it where it fell. Almost immediately the drooping trees lifted up their heads, the insects fled, and to-day, when the ground has not been stirred for more than two years, this erewhile sickly grove is one of the finest and most beautiful sights to be seen in Florida.

And just here we see why it is so difficult to lay down a given rule as a safe guide in all circumstances for the would-be orange grower to follow.

It is emphatically true in orange culture, as in many other things, "that circumstances alter cases."

While the trees are young, and their roots extend over but a small portion of the ground, it is a good plan to cultivate the grove as a vegetable garden, in this manner: The fertilizers used for the latter do double duty, as any surplus left by the vegetables goes towards enriching the land that by-and-by will be invaded by the hungry army of orange rootlets, the green stuff also that remains after the crops are gathered, supply a very necessary element to the successful grove, namely, vegetable humus.

During the first two seasons, when the trees are only four or five years old, the vegetable rows may approach the trees within

four feet, but every year afterwards the distance should be increased one foot, until the cultivation of vegetables finally ceases, and the orange rootlets run riot over the whole grove, revelling in the rich soil that has thus been prepared for their coming.

It behooves every orange grower to keep his eyes open, to read, to watch, to observe not only his neighbor's methods and experiences, but also to note the results of his own work, and alter his course if it seems likely to wreck his particular barque.

CHAPTER IX.

MULCHING AND PRUNING.

In the question of "Mulch or not to Mulch," we come on another disputed point. Some advocate mulching orange trees, both old and young, advocate it most emphatically; others oppose mulching at all, just as vehemently, while others again say, "Mulch young trees, and those just set out, for a year or two, but never mulch otherwise."

Who is right, and who is wrong? No doubt, in this as in other questions where opinions differ, there is some right, and some wrong on all sides.

Taking it altogether, however, there is much more to be said in favor of mulching than against it. Its opponents are in the minority now, and likely to become still more so as time rolls on and brings greater experience in orange culture.

In one of our most reliable agricultural works we find the following concise declaration as to what mulching does: "Mulching holds moisture in the soil and retains the atmospheric ammonia, breaks the force of the rains, and thus prevents the ground from being baked; prevents also the soil from freezing so easily as when exposed; prevents rapid thawing during the heated season, and cools the earth: these are the principal advantages to be derived from mulching, and yet they are sufficient to make any farmer think favorably of it."

And we will add, not only farmers, but especially orange growers, mulching their trees, has been practiced by our oldest growers, and the fact that they still continue the practice, speaks volumes as to the result of their years of experience.

The objections made to its use by some are, that it tends to increase the surface roots, and increase the liability of them to injury from frosts.

The first of these statements is true—mulching does produce more roots at the surface; but what then?

It is to these very surface roots that the citrus family is indebted for its chief supply of food; these are the main purveyors of the tree, the large roots serve as anchors and canals through which nourishment is conveyed, but the tiny, fibrous roots that creep here, there, and everywhere, are ever on the look-out for food supplies, and where they find it most abundantly, there they go.

They seek shelter and warmth, beneath the shelter of the mulch they always find it ready for them. The warmth they might have had without the mulch, but not the moisture. The more of these surface roots there are the better; as the orange is a surface-feeding tree, and as the mulch rots away, a rich vegetable mould accumulates around the tree, which is of immense benefit.

A grove where the trees are well mulched does not need half so frequent cultivation as one where the ground is left entirely bare. Whatever portion is kept covered by the mulch is kept free from weeds and grass, the ground is rendered porous and friable, and the roots which would be near the surface, even without the mulch, are protected from their greatest enemy, drought, very effectually.

Some advocates of mulching go so far as to recommend shading the entire surface of the grove. Now this is profitable under some circumstances, where the trees are large, and shade a good portion of the ground by their foliage, so that the mulch need only cover the intermediate spaces, but when the trees are young, it would require so great an expenditure of time, labor and money, as to be almost impracticable. It is all-sufficient that the ground be covered to a depth of several inches, leaving a bare space of about a foot around the tree. The mulch should extend about two feet beyond the outer roots. This is very important. Never allow the mulch to touch the trunk; it will soften and rot the bark, and encourage insects to settle around it.

We have not yet touched on the second objection of the anti-mulchers—that “of increased liability to frost.”

In reply to this, we give an extract from the report of one of our well-known Florida growers, and another from a prominent planter engaged in orange culture at Pass Christian, Mississippi.

The Florida man says: "It has been urged that mulching makes the orange tree tender, and more liable to freeze. Believing a statement of this kind, I was kept from mulching for three years, and then I only began by the trial of a few trees at first. I am satisfied, by careful experiments and observation, that no harm can come to trees on that account if properly applied, Old trees and young trees—trees just set out, and trees bearing five hundred oranges each—have been alike benefited. Trees that were mulched during the freeze of last winter, came out of it much better than those that were without mulching; and now, during the present dry weather, while other trees are becoming yellow and curling the leaf at mid-day, the mulched trees retain a dark green, healthy color, and are growing right along."

So much for our Florida witness; now for the voice from Pass Christian. "My grove of five thousand trees escaped very serious damage during the severe cold of two seasons ago. I attribute this exemption to a thorough mulching of the soil, which protects them from the intense heat of summer as well as the cold of winter." Surely the experience of these two men should count for something, especially when in almost every paper we glance at we see notes, here and there, showing that others have made the same discovery.

Altogether, mulching bids fair to play no unimportant part in the future of orange culture.

The least expensive way of mulching is to spread dried or partly decayed vegetation (no woody fibres) around the trees in the way we have already mentioned, several inches deep, a foot from the trunk and two feet beyond the outer roots—grass, weeds, leaves, straw, pine needles, well-rotted sawdust, bagasse; all these are good, and always to be had in quantity, merely for the labor of gathering them. When the mulching becomes thin, as it will in time, when the lower portions decay and work down to feed the little rootlets, replace it, and at the same time enlarge its

area, remembering that the trees are growing all the time, and their roots reaching out farther and farther.

A top dressing of lime, ashes, or potash will hasten the decay of the mulch. It is, at the same time, of great benefit.

It is wonderful how a tree thus treated will flourish, even when it has been in poor condition up to the time of applying the mulch. An instance in point is that of a bearing grove when the oranges were dropping off, the leaves yellow, and the trees sickly. At this juncture the owner caused two cart loads of mulch to a tree to be spread on the ground, so that the entire space between the trees was covered, at a cost of twenty-five cents per load. In two weeks the oranges ceased to drop, the leaves went back to their healthy green color, and the trees bristled with new growth. It was two years before the mulch had to be renewed, and in all that time neither the expense of hoeing or cultivating the grove had to be met, the mulch keeping the ground moist and friable, and choking out all weeds.

There is a mode of mulching that we have not referred to, that is well worth general adoption, combining as it does the double benefit of mulching and green manuring.

This is, to remove carefully the loose earth from the roots of the trees to as great a depth as is practicable without injuring them, then to fill in level with the ground the mulching material, which in this case should be grass, weeds, cow peas, or other green stuff; sprinkle with lime or ashes if handy—it will do without, however—then tramp it down, and throw on top the soil taken out. This retains the moisture, hastens decay, and absorbs gases that would otherwise escape. It is mulch and manure at the same time.

The question of pruning is one about which there is little controversy—less so, perhaps, than any other one point in orange culture, though even here there are some who differ from the great majority.

Of all domesticated fruit trees, the citrus family requires the least pruning; some say none at all, but experience teaches otherwise.

Pruning is one of nature's great laws in the vegetable kingdom. Look at our forest trees. In their youth their branches

are low on the trunk, they are needed then to shelter the tender stem from sun and rain. As the tree grows older these first branches drop off, leaving the stem clean and graceful. Dame Nature has pruned them. When a branch dies by-and-by it decays and falls to the ground; it is useless, so that too is pruned away. Look at the young pine-trees, their branches are low and sweep the ground, but the matured trunk rises eighty feet in the air without a single branch.

Never use a dull knife, saw, or shears in pruning a tree; the sharper the tool the better.

It is always best to use shears on the smaller branches rather than the knife, the latter being apt to slip and tear the bark. When the knife must be used, however, let the cut be upward rather than downward, as this lessens the danger of damage to the limb. Bear in mind that a rough haggled cut does not readily heal, and very often never heals, thus injuring the tree permanently, and for this reason when large limbs have been sawed off, the cut should be pared smooth with a knife, and then covered with thick shellac varnish, or grafting wax to exclude sun and rain until healed, otherwise disease may be communicated to the whole tree.

All water-sprouts—that is, sprouts starting near the ground—should be pinched off as soon as they appear. They are robbers of the legitimate branches above them. Watch carefully for dead limbs, and cut them away as quickly as possible, taking a portion of the live wood with them, to be sure that none of it remains. “Once upon a time” it was thought that though a dead limb was unsightly and useless, it did no actual harm, but it has recently been proven otherwise. A dead limb not only evaporates the sap that should go to the nutriment of the tree, drawing it up by capillary attraction, like a sponge, but the elements of decay it contains flows back into the tree and so promotes disease; therefore, never let a dead limb remain to counteract all your good works.

Some branches there will be, not dead, but diseased, so that they either develop no leaves, or else sickly ones. Let these be pruned away also for the same reason.

Do not trim the branches up high on the trunk ; encourage low growth, especially while the trees are young. This is Nature's plan for protecting the tender bark from the sun, and should not be interfered with. As the tree grows taller, cut away the branches gradually, until when the tree is in bearing, you can just get under it by slightly stooping, but can stand upright against the trunk.

The most successful groves and the healthiest trees are those where the lower branches, when laden with fruit, barely escape or even touch the ground.

Keep an open head to the tree, so that the sun and air can reach freely to all parts, leaving the most vigorous lateral branches, and cutting away the weaker ones.

Never allow your young trees to become matted with branches inside, so that the trunk cannot be seen. Sooner or later they will crowd each other so much that you will be compelled to cut them out, and then all their vigor of growth will be just so much vitality thrown away. Better keep the head open from the start, and allow no such wastage of time and thrift.

By pursuing this course systematically, by the time the tree is ready to bear, it will be in fine shape—"a thing of beauty and a joy forever." It will then need very little after-pruning, except to clear out dead branches.

If you have set your trees twenty-five or thirty feet apart keep the tops low to facilitate gathering the fruit ; if, however, they are set only twenty feet apart, higher tops will be desirable, since the ground must not be too densely shaded by the foliage. The orange is emphatically a child of the sun, and will not thrive unless sun and air can circulate freely about and above its roots.

Prune in the spring, in January, February, or March. Fall or winter pruning is apt to be injurious, as promoting new growth at a season when growth should be checked.

Whenever possible, cut away the large thorns, that not only makes gathering the fruit a slow and delicate operation, attended with torn flesh and clothes, but punctures the oranges when swaying in the breeze, and thus renders them unsalable.

CHAPTER X.

HOW TO FERTILIZE.

This is a subject of great importance, and one that it behooves every farmer and fruit grower to study closely. It is the corner-stone of his prosperity, the back-bone of his wealth.

There are many commercial fertilizers in the market of approved value, and it is well to use them in conjunction with home-made manures, when one has the means to do so.

But scarcely one in ten of the embryo Florida orange growers is able to procure these, and so his chief dependence is on the home-made compost heap.

This is by no means a despicable resource, as we shall presently see; in fact, there is no excuse for any man in Florida who owns a horse and cart, for not having an abundance of valuable fertilizer for his trees, at merely the expenditure of time, the light labor of collecting trash, and hauling it home.

The man who has not the means to purchase the needed food for his trees, and yet has no great heaps constantly preparing for such, is simply a lazy man, and not such as will ever work his way to better times, even in Florida.

We do not need to discuss the question of applying commercial fertilizers, as each manufacturer publishes his particular directions, and these should be followed in each case.

For ourself, among many good fertilizers (Mapes & Stockbridges, for instance), we regard that already referred to in a previous chapter, "Gould's Fertilizer and Insect Exterminator," as pre-eminent for the orange grower, inasmuch as it is manufactured in Jacksonville, and thus can be, and is sold cheaper, because there is no freight to pay from the north; but also because it does drive away and kill the insect enemies of the tree, while also ministering to the appetite of its hungry little rootlets.

In forming a compost heap, the farmer should bear in mind the particular purpose to which it is to be applied, since neither all trees nor all crops take kindly to the same sort of food. There is as much difference, comparatively, in the food of the different members of the vegetable kingdom, as there is in that of the animal. A horse will not eat flesh, nor a dog hay; neither will all trees flourish on the same nutriment.

Every intelligent horticulturist is aware of this fact, and acts accordingly, being guided in the application of manures by the analysis of the ash of such plants and trees as they cultivate. It is on this principle and on this basis that the "special manures" are manufactured, each containing the particular ingredients needed by the particular plants to which it is intended to be applied; one may need a larger amount of ammonia than the soil naturally furnishes, another more phosphates, another more nitrogen. When these special fertilizers are made by honest manufacturers, they are very valuable aids to the farmers and fruit growers, either used alone, or mixed with the compost heap.

Analysis shows that the ash of the orange tree and fruit contains a larger percentage of potash, lime, and phosphoric acid, besides smaller quantities of other mineral ingredients; hence these are substances, conjoined with sufficient vegetable matter to retain moisture, that the orange grower must feed to his trees.

And now, how are these to be obtained? Easily, and by every man who chooses, for they are all about him in profusion, needing only to be vitalized by a provident, thrifty hand.

Pine land, on which the bulk of the orange fruit is raised, is deficient in vegetable humus, which is as necessary to the proper growth and nourishment of the tree as any other ingredient; perhaps, more so, since this humus has proven to be the most important vehicle of assimilation of the other foods; for instance, the analysis of a soil may show lime to be needed, and lime is forthwith applied, and without effect; but, powerless to work alone, combine it with humus, which, as every one knows, is simply decayed vegetable matter, and then its effect will be quickly visible.

Here is one of the many proofs that there are two distinct classes of manures—one serving as the actual food of plants, the other assisting in preparing that food by combining with the substance in the soil and bringing into a form that the plants can assimilate, or by changing such as would be inimical to the vegetable life and for its mediation.

Thus, for instance, when we apply lime to a newly broken piece of land which is mucky, we say that the lime has “sweetened it,” because its action on the carbonic acid contained in the muck is such as to change by combination that which would otherwise be hurtful to vegetation, and to transform it to a valuable manure.

Every orange grower should prepare a compost heap as one of the very first steps to successful cultivation.

Make a pen of any desired size with posts for the corners, boarded sides, and a tight board floor for convenience in filling: it is well to have one side made so that the boards can be added or broken away at will; two perpendicular strips at each end, with space between to allow the boards to move up and down, will be found very handy.

The tight board bottom is very important, as it saves all the liquid manure that would otherwise wash down in the ground and be lost; but even more so is a roof to cover the compost from the destroying effect of the sun, and also to shed heavy rains, at least partially.

No thrifty or intelligent man will allow his compost or stable manure to be exposed to the sun and rain, knowing as he does, if he have any ordinary knowledge of his business, that fully two-thirds of its value is thus wasted. A pile of stable manure or compost leached by sun and rain is a pitiable spectacle of slovenly farming, and the man who pursues this method may be sure he will never prosper, no more than the man who leaves his store open for thieves to enter and carry off his most valued stock-in-trade.

The compost pit prepared, the first thing to do is to put on a layer of muck about six inches thick, or if muck is not to be had, grass, weeds, sawdust, pine needles, pine burrs, rotten sap-

wood, and dead leaves will answer almost, if not quite, as well.

This supplies the humus element of plant growth, next a layer of cotton seed, costing ten cents per bushel at the gin-mill, or fourteen cents delivered within three miles. This is a valuable fertilizer, especially so when thus composted, and contains four per cent. of nitrogen, three per cent. of potash, and three per cent. of phosphoric acid—a ton of the seed being worth seventy-two dollars as manure—another layer of muck, then one of stable manure, another of green trash with muck again; these thoroughly wetted at the time of piling, and worked over once or twice, will in three months' time furnish the thrifty orange growers with as fine a fertilizer for his trees as any money could purchase, especially if some days before applying to the trees his means permit him to whiten the land with lime or ground plaster.

The capabilities of a compost heap are, in fact, almost unlimited; it is a take-all, and hold-all receptacle, of which, one may truly say, all is fish that comes to its net.

Nothing that is subject to decay comes amiss—rags, old clothes, old shoes, old newspapers, trash of all sorts, kept moist with liquid manure, or house slops, etc., will in a few months become useful and available plant food.

Every animal that dies on the farm should be dismembered and buried deep in the compost to join a valuable element thereof—lime, land plaster, ashes, poultry guano—all these add vastly to the supply of plant food furnished by the compost; but be it known and heeded that ashes and poultry guano should never be mixed, as the ammonia of the former will thereby be liberated; neither should lime and stable manure be composted together, for the same reason.

Land plaster may, however, be freely used with great benefit, especially when applied directly above a layer of either guano or stable manure, as it prevents their ammonia from escaping.

Where one can afford to purchase bone-meal, making sure that it is genuine, it will pay liberally to apply light layers of it to the compost heap.

A few years ago the relative value of bone-meal and stable manure was tested with the following results:

1st. One bushel of crushed bone is more than equal to twenty-five bushels of good farm-yard manure.

2nd. That bone-meal is more permanent in its effects than any putrescent manure usually produced on a farm.

3rd. That its effects on good land is more manifest than on inferior.

4th. That when combined with putrescent manure, or composted, the effect, both instant and remote, far exceeds that of any manure known.

About twenty years ago a Mr. Bonner, of the State of New York, patented a process of quickly rotting manure, which was tested with great success, the manure being ready for use in fifteen days. The patent expired long ago, but the process has only lately been made public, and is now open to all, and should be generally adopted, as the expense is very trifling, and the labor of handling no greater than any other compost.

At the foot of the pen should be a vat, or hogshead, partly sunk in the ground for convenience sake, of a capacity of six or seven barrels.

Into this vat all the soap-suds, house slop, drainage from the barn-yard, etc., are to be poured. If it takes too long to half fill the vat in this manner, fill in with water, or, better still, with liquid manure, two pails full of stable manure to one barrel of water; let it stand twenty-four hours before using. When the vat is from one-half to two-thirds full, add the following mixture:

Unslacked Lime.....	two bushels.
Soot.....	two bushels.
Salt.....	four pounds.
Saltpetre	two pounds.
Unleached Ashes.....	two bushels.
Land Plaster	five bushels.
Condensed Manure, such as Hen Guano,	
Privy Manure, or Bought Fertilizers.....	three barrels.

These amounts are sufficient to decompose one ton of dry wash, or ten tons of green stuff, and of course can be easily reduced in quantity when desired.

Mix these ingredients with the water, adding the lime, ashes, and land plaster last of all.

Place in the pen a layer of muck, dirt, or sawdust, about three inches thick; then add the materials to be rotted, straw, grass, leaves, sawdust, etc.; wet them thoroughly with the liquor from the vat, well stirred before using; then add another layer of muck and wet that, and so keep on, alternating muck and trash until the pen is full, wetting each layer as you proceed.

Your pen should have a roof, as stated elsewhere; and this is a very important matter, and one especially insisted on by Mr. Bonner in his patented formula given above.

Repeat this wetting every four or five days, first making holes with a crow-bar worked back and forth, and then pouring the liquid from the vat freely over the whole pile.

In fifteen days the manure will be in perfect condition, well rotted and fine; heat will be generated in one week, and should it seem too great, may be moderated by the use of water. Do not be sparing of the liquor at the time of first piling the heap.

In this formula, it may be noted that substances known to be antagonistic are brought together—ashes and hen guano, lime and stable manure—yet here their mutual destroying propensities are conquered, and in achieving this desirable result lay Mr. Bonner's patent.

Let us look into the chemical action that takes place among these various materials, and see how he explains it.

The fermented liquor starts the heat, assisted by the lime. The lime being a hydrate is caustic, and a re-arrangement of the particles takes place, owing to the eagerness of the lime for carbonic acid, which is generated immediately the heat begins. Ammonia is formed from the ingredients of the heap, but first from the liquor in the vat. The formation is also hastened by the lime and potash; the saltpetre also liberates nitric acid. Ammonia, though gaseous, exerts a mysterious effect of its own in the heap, and greatly assists decomposition.

But it may be asked why the lime and potash do not set the ammonia from the heap. Such would be the case in an ordinary

barn-yard heap ; but here the process of decay progresses under different conditions.

First, the heap is kept wet with the liquor, as the wetting occurs every few days ; second, the muck, sawdust, and other absorbents are a protection. Water absorbs and retains ammonia, and the rotting of the heap is so rapid, and the chemical changes are so numerous, that it is finished before an escape can be made.

At the end of fifteen days, as we have said, fermentation ceases, and then the mass should be overhauled, well mixed with dry earth, muck, or sand, and put away under shelter, which will prevent its heating again, and preserve the volatile matters until ready for use. So thorough is the fermentation that it would be a difficult matter to create heat again, even if desired.

The utility and economy of this process consists in the converting of leaves, corn-stalks, cotton-seed, rotten sap, etc., into ready-made manure. All seeds are destroyed by the process, so that any noxious weed may be fearlessly cast into the heap ; bones broken into small pieces will be dissolved at once, and become valuable plant food.

A compost made by this formula is not only ready for use in so short a time, but its value is double that of ordinary stable manure, and contains all the elements of plant food.

And all this valuable fertilizer can thus be made at home by Bonner's process, at a mere nominal cost of five dollars per ton. This is the *ne plus ultra* of compost heaps.

If the soot called for in the formula cannot be obtained, use more saltpetre ; if ashes, turn up missing, substitute ten pounds of caustic potash ; and remember, never to leave the pile uncovered. Nor, we may add once more (for this cannot be too strongly impressed on the fruit grower), any other manure heap if its full value is desired to be preserved.

A word or two about the best manner of preserving stable manure while collecting : nine out of ten of the Southern farmers stable their horses in stalls with the ground as the only flooring. This is a great mistake, and occasions a waste of the most valuable portions of the manure, the liquid, or urine.

In a valuable little book, called "Talks on Manure," by Joseph Harris. He tells us that one ton of stable manure contains only twelve pounds of nitrogen, six pounds of phosphoric acid, and thirteen pounds of potash, and these are its only elements of practical value. Think of it, out of two thousand pounds of matter, only thirty-one pounds of manure—all the rest waste; and here is the plan Mr. Harris proposes (and has proven for years to be all that he claims) for increasing the properties of the proportions of nitrogen, phosphoric acid, and potash, and reducing the amount of waste to be handled.

Instead of throwing the manure out of the stables, and putting it in piles to be leached and sun-dried, keep it when it drops; keep the stable well littered with straw, grass, pine-needles, and sawdust, which answer the double purpose of making good beds for the animals to lie on, and of absorbing the liquid manures and the gases of the other fermenting excrements. The urine of domestic animals is worth much more than the dung, and this I have found the best and cheapest way of preserving it. Keep a good supply of "trash" on hand, and every two or three days, as the stalls become foul, cover them with a fresh layer.

Let it stand during the whole season, and in the spring have it out and distribute it. The whole mass will be decomposed and comparatively dry.

One load of such manure is worth half a dozen that has been made in the usual way, and all the labor of repeated handling will have been avoided.

We have now said quite enough to prove one assertion a while ago, that there is no excuse for any man in Florida, who can procure the services of a horse and cart, for not having a sufficiency of fertilizer for his grove.

If he has no horse of his own, it would be an easy matter to go out in the piney woods or hammock, rake up a number of piles of trash, and then hire a horse and cart for a day to haul them to his compost pen.

In applying fertilizers to trees, the latter should be treated rationally. A surfeit of rich food will derange the animal system, and so it will the vegetable. Too large quantities of ma-

nures—rich in nitrogen, for instance—will cause die-back and fungoid diseases.

While the trees are young, and in rapid growth, they will bear heavy manuring, just as a growing child will eat more in proportion than an adult ; but if the system of high manuring is continued after they have arrived at the bearing age, eight or ten years, it will almost invariably retard their fruiting, as too rich a soil gives a tendency to make wood rather than fruit.

Therefore, after the seventh year, the quantity of manures applied should be gradually lessened, and only enough used to keep the tree in a healthy slow growth condition.

In manures for young trees, nitrogen should be present in larger quantities than for bearing trees, the latter requiring more potash, phosphoric acid, lime, and other kindred manures.

Yellowish leaves indicate a deficiency of nitrogen in the soil ; dark green leaves show that there is plenty of it.

An ex-nitrogen attracts the rust insect. Slack lime is a good remedy, scattered on the ground and sifted through the leaves. It is better to use this before the trees comence to bloom and when the leaves are dry.

When the clay is five or six feet, or more, below the surface, so that manures are liable to be washed down below the roots, three or four light manurings—one in January, another in March, another in June, and last in August, are better than one or two heavy manurings. The first should be heavier than the rest, however, as tending directly to help the latest buds and young fruit. Liberal manuring early in the spring as possible—and by this we mean the Florida spring, which begins in January—conduces to a larger and finer fruit crop than can be attained when this is neglected. Frequent experience has proven this as an invariable rule, other things being equal. When clay is within three or four feet of the surface, two heavy applications of manure—one in January and the other in July—are all that is necessary, the clay serving as a base to retain it until the roots can assimilate it.

CHAPTER XI.

ENEMIES, AND HOW TO FIGHT THEM.

So much has been said and written about the diseases of the orange tree, that one might think it one of the most delicate and cruelly afflicted trees in the vegetable kingdom.

For instance, there are no less than sixty insects that prey on the apple tree, twelve on the pear, sixteen on the peach, seventeen on the plum, thirty-five on the cherry, and thirty-one the grape.

And yet we have heard orange growers grumbling over the constant fight against the insects that attack their trees. To such we commend a glance at the above host of enemies upon which the northern fruit growers are waging constant and not always successful war. Many of these are borers, and their work is done in secret, and in an almost impregnable fortress; whereas, an orange tree has no borers, all its foes being open and above board, and hence easily detected and conquered.

The renowned scale insects are the most injurious, and before the best means of fighting them was discovered, did much damage to the trees and threatened a wide spread destruction to the orange interest in Florida, when it first appeared in the State, which was at Mandarin, about twenty years ago, being carried there on orange trees brought direct from China.

It may seem surprising that from a few trees, and from one grove, this minute enemy of the orange tree should have spread all over the State, and that, too, in a very short time; but when one comes to consider the matter, it is not so wonderful after all.

For one thing, there are several small beetles, and some large ones, found in all our groves, that feed on the scale, or coccids, and as the latter are very minute and are often seen to mount on the backs of their unconscious enemies, they are thus carried by the beetles from tree to tree, and also from grove to grove.

Again, the shrike, or butcher-bird, dearly loves to select the long, sharp thorns of the orange tree, on which to impale his victims, insect, lizard, or small snake, as the case may be.

He prefers trees that have long branches, and these are the very ones, as a rule, that are most thickly infested by the scale insects, especially the long scale.

In impaling his prey on the thorns, the bird moves his little claws freely over the branch, and some of the insects clinging to it are sure to adhere to them, when he flies off to another tree or grove, and the scale is rubbed off and finds a new field for its work. The butcher-bird also frequently transfers his impaled victims from one tree to another, and if the first has been infested with the scale and the second has not, the latter cannot much longer boast of its freedom; and even when the bird eats his prey from the thorn on which it was first impaled, some of the scale insects, that are certain to adhere to it, will cling to his beak, and more likely than not, be rubbed off on some other tree.

We have a friendly feeling for the butcher-bird; he is such a neat, Quakerish-looking, fat, chubby little fellow, and so familiarly saucy withal; and we are sorry we cannot acquit him of helping to spread the enemies of our groves, albeit he does it without *malice prepense*.

High winds are also important and wide-spread factors in the distribution of scale insects, all of which are small and light; nursery stock and matured fruit itself are also active agents in the matter.

What is this much talked of, much fought against, scale insect, you ask?

For full and detailed information on this point, as on that of all the insect enemies and friends of the orange, we would refer our readers to the valuable work on "orange insects," written and published by William H. Ashmead, of Jacksonville, Florida; and also to those of Prof. Comstock and Dr. C. J. Kenworthy. This book, being devoted exclusively to the one subject, deals more extensively with the enemies of the orange, than the limits and object of our present work permit us to do.

Briefly, therefore, we will note the most injurious of them only, that they may be recognized when seen, and the proper weapons used in the battle against the invaders.

The long, or mussel-shell scale insect, is a very tiny fellow, rarely to be seen, unless revealed by a powerful microscope; then it appears like a very lively louse, quick and active in its movements, and when alarmed, instantly seeking concealment under the scale it has created as its dwelling, which has first served as a home for its eggs, which are purple and laid in two parallel rows, and then for its young.

The latter, the moment they emerge from the eggs, begin to suck the sap from the bark or leaf to which they may be attached. One would hardly think that such a tiny thing could do so much damage to a noble tree; but the trouble is in their number, which is legion. At length, from under the scale-dwelling, emerges a little fly that may be seen, sometimes, if one stands so that the branch on which they are is between him and the sun, when the latter is low on the horizon, and then jars the tree. They will then scurry around and become visible through their movements for three or four days around over the tree, then insert their beaks in a suitable spot and come to an anchor forever. In a few days the waxy substance of which their scale-house is composed begins to arch over their backs; their legs, useless now, drop off, and the fly, reversing completely the order of things, returns to a larval shape, lays its eggs and dies; soon the eggs hatch and the round of reproduction begins again.

There are several kinds of scale, but all are to be plainly seen on the leaves, twigs, and even on the fruit. All are enemies to the tree, and all may be killed by the application of the remedies given at the conclusion of the present chapter.

The white scale is the most noticeable, its color and the large size of its scale-house, in comparison with that of the mussel-shell scale, just described, making it very conspicuous.

The scale is highly arched, and of a pinkish-white at maturity, with seven well defined dots, three on each side, and one at the posterior. Just before the eggs hatch, the scale

becomes more globular in form and the top takes on a brown tint.

The insect, which is pale yellow, and looks under the microscope like a wood-louse, crawls about for a few days, then strikes its beak into the bark, and the waxy scale begins to form. This completed, the eggs are laid, over one hundred in number.

Mr. Ashmead, in his work already referred to, makes a calculation of the progeny of one of these scale insects, for one season, and it amounts to the frightful total of one million.

If it were not for that Providence which is ever watching and planning for man's welfare, his fight against the spread of these destructive insects would be an almost hopeless one; but he is not left to battle single-handed. Even the most minute insects have their relentless "war of races," and thus the scale insects have enemies, who, had they happily been imported into our country at the same time, would never have allowed them to spread far and wide and create the panic they did among orange growers.

Chief among these staunch friends of the orange tree, are the orange scale aphelinus, the twice-stabbed lady-bug, minute scymnus, red mite and orange chrysopa.

The first-named, the orange scale *Apelinus*, is a four-winged fly, about 0.2 of an inch long; it lays one egg under each scale among the eggs of its foe, and as soon as the larva, which is a white footless grub, is hatched, it begins to feed on the latter, changing into its pupa state only when the last egg is gone; a few days later it punctures the top of the scale, and emerges in its perfect fly-shape.

The next of our good friends, being more noticeable, is often, alas! ruthlessly slaughtered for an enemy by those who, if they knew its true character, would carefully protect it. From February to November in this State one often sees a little round, dark bug with two red spots on its wings, and also a dark slate-colored larva, crawling among the orange trees. They are one and the same insect, the twice-stabbed lady bug, and it is so valuable a friend to the orange grower, as to be worthy of importation to any grove where they have not voluntarily settled.

They breed throughout the year, and in the fall lay their eggs where the scale insect is most abundant; then, when their eggs hatch, the dark spine-like larva at once commence feeding on the scales around them; soon they crawl off to a retired spot, affix themselves to a leaf or branch, and become pupæ, which, in a few days again, change to a soft pale-colored beetle, without a sign of the spots and dark wings shortly to appear.

If there is any Spanish moss on the tree, the larva will be found there in greater numbers than elsewhere.

The minute scymnus, large scymnus, and red orange mite, are so small as to be rarely observed by the naked eye, and hence need no description here, as they are exposed to the same danger of destruction by those they serve as are those heretofore mentioned.

The two former are beetles, whose larva, hatching in the spring at the same time with the scale insects, wage relentless war upon them.

They come in April and disappear in June, to reappear when the great fall broods are hatched.

The orange *Chrysopa* is another most helpful friend; it is a small, lace-winged, yellowish green fly, much resembling a tiny dragon fly; its eggs are suspended on a delicate thread to the orange leaf, the larva covers itself with minute pieces of dried leaves or bark, feeding on the scale inside until the time comes for it to form an oval mass-like cocoon on the upper part of the leaf, whence in a few days the perfect fly emerges.

The blood-red lady bug is also an exceedingly active helper to the orange grower, devouring the scale insects by the million; the pupa emerges from a gummy substance attached to a leaf, and becomes a perfect beetle (red) without spots or markings. We have been thus particular in describing the appearance of these little friends of ours that they be recognized as such, and their lives spared; other friends the orange tree has besides, but we have not space to enumerate them.

The mealy bug is one of the most serious enemies, not only of the orange, but of the pine-apple, and if not relentlessly fought, threatens to become a worse enemy than the scale.

It makes no scale shelter, is even moving about, and places its eggs beneath a cotton-like substance. In twelve days they hatch, and the young begin their career of destruction, sucking the juices from the tender leaves and twigs, the odd mealy substance from which they take their name, forming meanwhile all over them. They increase very rapidly, breeding all the year, and seem to defy any wash that does not contain kerosene; this, however, is fatal to them.

The leaf-footed plant bug is another destructive foe to the orange, and also to the plum, rice, and many other vegetable productions.

The young are a bright yellowish red, without the leaf-like extension to their legs that afterwards appears. The adult is a curious shaped reddish brown bug, having a long sharp beak, and a transverse yellowish white band across its wings; when the latter are raised, its back is seen to be flat and hollow, red in color, with black spots; its hind-legs are oddly shaped like narrow leaves. It sucks the sap from tender shoots and terminal branches, thus killing them outright.

Mr. Ashmead gives the only remedy known, of catching them in a butterfly net and scalding them.

Grasshoppers and katydids are also destructive foes to orange trees, devouring leaf after leaf in an incredibly short time; their quick, active movements make them hard to deal with, and the best-known weapons with which to fight them are the birds and a flock of chickens, and guinea fowls in the grove.

There is a large, beautiful butterfly that may be seen everywhere in Florida, from early spring to winter; it is black, with two yellow bands across its wings, formed by a series of yellow spots.

Under the rule of "Handsome is as handsome does," the orange grower has reason to consider this beautiful insect as hideous, since it and the orange dog, or puppy, are identical.

Whenever you see a little round egg sticking to an orange leaf, crush it at once; the orange butterfly has laid it there, and directly it will become a peculiarly marked worm, with a large

head, from which it projects red filaments, and opens its large mouth like a snarling dog when disturbed.

Until within the last year or two there were various opinions about the cause of the rusty appearance of so many Florida oranges; now, however, no doubt remains on the subject. It is caused by a minute insect, called the rust mite, that would never have been discovered but for the microscope being applied to the orange while still on the trees, for within half an hour after the fruit is taken from its parent stem every insect has disappeared. The mite punctures the oil cells, the oil exudes and becomes oxidized, and hence the dark appearance and hard, rusty skin of the fruit.

This appearance damages the sale of the orange, but does not impair its quality; in fact, it appears rather to develop its saccharine qualities. Place before a Florida child two oranges, one bright, one rusty, and it will seize the rusty one first. The rusty orange, protected from the air by its hard dry skin, ships much better than the bright; and, so, if it were not for the damage done to the looks, and hence to the sale of the fruit, there would be little fault found with the mite.

This one consideration, however, is enough to cause war to be declared against it; but, fortunately, remedies have been found, to which we shall presently refer.

One other insect we shall mention, because it is very easily seen, and its destructive operations openly conducted right under one's eyes—he is a bold, fearless marauder. Professor Riley, of the Agricultural Department, calls him *Euthoetha galeator*.

He resembles greatly the well-known squash bug, and delights to insert his strong proboscis in the tenderest shoots to be found, causing them to wilt and droop to their death, even while he robs them of the food on which they live.

The insect is one of the chief causes, if not the chief, of the so-called disease of *die-back*.

We have now described, so far as the limits of our present work will permit, the chief enemies and friends of the orange tree, and will now proceed to give the most effective weapons with which the former may be conquered.

It is not enough to know the formulas of washes to be applied to the trees, but also at what time the application should be made to be effective.

Let us take the long or mussel scale insect at first: the first brood hatches from the middle of April to the first week in May; the second, from the last of July to the middle of August; and the third and last, from the last of September to the middle of October.

The white scale has also three broods: the first, in April and May; the second, from the middle of July to the 1st of August; and the third, from the last of August to the second week in September.

He who waits until this protecting shield has been reached may as well spare his labor, for his most powerful washes will fail to penetrate it, or to disturb the insect. Applied at the right time, however, as given above, just after the eggs are hatched and the fly has left the scale-house, it is easily exterminated.

When trees are very badly infested, it is well to cut off and immediately burn the smaller limbs; then, with a fountain spray pump, drench the tree thoroughly with one of the preparations given below.

FOR SCALE INSECTS.

No. 1.

Sal Soda.....	10 pounds.
Hard Soap.....	5 "
Water.....	40 gallons.

Dissolve the soap in a little boiling water, place it in a tight barrel, break up the soda in small pieces, add it, fill up barrel with soft water, and stir the mixture till well mixed. Keeps good indefinitely. Apply to trunk and large branches with a brush, rubbing in well; drench top and leaves with a rose syringe. Apply twice a year, spring and fall; oftener if the grove is seriously infested.

No. 2.

Tobacco Stems.....	5 pounds.
Copperas.....	5 "
Water.....	40 gallons.

Boil tobacco in sufficient water to extract the full strength, strain and measure liquid; put in a barrel, and add enough water to make up the forty gallons; then add the copperas, and stir till dissolved. Apply as before stated.

No. 3.

Whale-oil Soap.....	10 pounds.
Kerosene Oil.....	5 gallons.
Water.....	5 “

Common soap will do just as well, if the other is not to be had.

Dissolve the whale-oil soap in hot water, then add the kerosene, churn them together until well mixed. For use: add one quart of the emulsion to two gallons of water. Apply as before.

This preparation is destined to supersede the lately discovered “kerosene butter,” made by combining condensed milk and kerosene, as being much cheaper, quite as effectual, and much less labor to prepare. It does not injure the most tender shoots, and kills the scale at once; is also a valuable fertilizer, and as it falls back from the leaves and sinks into the ground, drives away the ants and other insects that may be in hiding around the tree.

No. 4.

Cotton seed hull meal or ash; syringe the tree with water, then throw up the ash into the tree.

This is effectual for small trees, but not so good on large, because the upper limbs are apt to escape.

FOR THE MEALY BUG.

The formula given as No. 3 is the safest to apply to the bug, as the other washes seem to injure it very little, if any; kerosene will destroy it.

FOR THE RUST MITE.

Any of the above, but especially No. 2, will check their work if applied early, as soon as the first signs of them are detected; but the best and the most permanently effective treatment is slaked lime, dusted into the tree as thoroughly as may be, and scattered on the ground as far out as the roots extend.

Whether this application kills the insects, or whether the

additional amount of carbon thus furnished to the tree takes from the essential oil of the orange that quality which attracts the rust mite to it, is not yet determined, but it suffices that the effect is undoubted. It has been proven both in the West Indies and in Florida.

LICHENS, SMUT, HONEY DEW.

For ridding tree trunks of lichens and old half-loose bark, for removing smut and that sticky substance, the excrement of insects, called honey-dew, formula No. 1 is very effectual, used with a scrubbing brush on the tree trunk, for lichens and old bark, and with the hand-pump for smut and honey-dew.

ORANGE PUPPY.

As a rule, this worm, to which we have already alluded as identical with the large butterfly, is not seriously aggressive, and can be kept down by hand picking, because its numbers are not great in any one grove, except in some few cases; the mocking-birds, woodpeckers, and butcher-birds proving excellent remedies against its alarming increase, where, however, it becomes so troublesome as to really injure the trees by robbing them of their foliage; drenching the tree with lime-water will prevent the mother butterfly from depositing her eggs among them, as no butterfly will light on a plant syringed with lime-water.

DIE-BACK

Is, as we have noticed elsewhere, caused by the attack of insects that kill the terminal branches and young shoots as fast as they appear. Now, with every new shoot its corresponding roots die also; and so, ere long, the whole tree feels the loss of its needful nutrition, and twig after twig, branch after branch dies back, often puzzling the owner to determine the trouble.

Chief among the insects that have been proved at last to be cause of the trouble, are the leaf-footed plant bug, and the *Euthoetha galeator*, which, not being stationary, are hard to rout, but may be driven away by several drenchings of No. 3; but the tree must be carefully pruned of every dead or sickly limb, or even, if necessary, its whole top cut away to give the few roots left alive a chance to recover their vigor

CHAPTER XII.

GATHERING AND PACKING.

It is a proud and happy day to the orange grower when he gathers in the first golden herald of the good time coming, and thus receives the glad assurance that the reward of his years of toil and patience are close at hand—that the night is past, and the dawn of prosperity is near.

It is not every one who knows how to gather and pack his crop so that it will reach its distant market in good order, and yet this point is so important, that if not properly understood, it matters not how full a crop the tree may yield, since the fruit will yield no profit, but rather loss, since freight must be paid, whether the fruit will sell for enough to cover it or not.

This matter of proper shipping is a rock on which many a goodly barque, sailing out into the world with fair hopes and prospects, becomes an utter wreck.

And the worst of it is, that such shipwreck as this, at the last moment, is caused almost invariably by culpable carelessness on the part of the owner of the fruit, whether he does the work of picking and packing with his own hands, or trusts it to hired help, who have no interest in the well being of the crop or its ultimate fate.

As soon as the oranges begin to show by their yellow tinge here and there that ripening has commenced, the trees should be examined every two or three days, and all speckled or defective fruit taken off, the ripest first. This serves two purposes: first, such fruit is always the earliest to ripen, and if carefully handled and shipped, it will pay well to send it forward while the market is comparatively empty; second, the removal of such defective fruit, which will only get worse if left on the tree, will benefit the fruit remaining.

Step-ladders are usually employed in gathering such oranges

as cannot be reached from the ground, as it is almost impossible to find a secure resting place for an ordinary ladder, and besides, it is constantly catching of side limbs.

Better, however, as well as cheaper than either, is another sort of ladder, which may easily be made by any one, out of materials nearly always to be found "lying around loose" on the farm. The steps are made of strips three inches wide about fourteen long, nailed at proper distances apart, on a plank two inches thick and from six to eight inches wide.

This simple ladder is easily handled and rests securely on a limb, where the ordinary ladders would shake back and forth, while the projecting side-pieces, or steps, serve a useful purpose, when it is desired, to hang the bag or sack of the picker on them.

This bag, its mouth held open by an oval piece of wire, should not be too deep, nor too large; if the former, the first oranges picked are apt to be bruised in dropping; if the latter, the bag will interfere with the picker's movements, and will become too heavily weighted to be carried with ease, no matter how broad the band that secures it around his shoulders.

The orange should never, as is too often done, be pulled from the stem, as this rude severing almost invariably tears the skin and "plugs" the fruit, which is then unfit to be shipped, since it will surely rot on the way and damage the whole box.

A sharp knife, or small shears, are the proper things to use, and the stem should be so clipped that from one-eighth to one quarter of an inch remains on the orange.

If the oranges are of different varieties each kind should be carefully kept by itself.

As soon as a cart load has been picked they should be hauled away to the packing-house, and if this is any distance from the grove, or if the road, though short, is rough, moss should be placed at the top and sides of the cart to avoid bruising the fruit, for the orange, when just "under ripe," as it usually is, and should be when picked, is plump and solid; the skin is composed largely of water, and if its tiny cells are bruised and broken, decay at once sets in.

Every shipper should have a house or room set apart for curing and packing the fruit.

There are two methods of preparing it for shipment, of which the old method, which is termed sweating, would seem the very worst treatment to which it could be subjected, and we believe it to be so, and to have caused the loss of thousands of dollars to Florida orange growers.

As we have said, the skin of the newly-plucked orange contains a great deal of water, and before packing it for shipment, we want to get rid of this surplus element of decay.

In order to accomplish this desirable result, it used to be the universal custom, and one that is still too much in vogue, to put the oranges in a large heap and cover them with blankets, leaving them thus for several days, until they had undergone a sweat, a number being rotted and crushed by the process, and the inevitable germs of decay generated in many others.

Those that appear sound after this ordeal are spread out for a day to dry, and then shipped, almost invariably to be reported, "arrived in bad condition."

Who can wonder? They have been coaxed and encouraged to decay before their journey was commenced, by having their tender skins heated, steeped in moisture, and their cells crushed by pressure.

A far more sensible plan of curing oranges and lemons is that adopted by the more progressive growers.

Around on the walls of the well ventilated room or house, shelves should be made as deep as one's arms can conveniently reach across, the first shelf about two feet from the floor, and the others about one foot apart.

These shelves should be composed of narrow slats, two inches apart, their edges carefully rounded off, to avoid bruising the fruit, and one of the slats placed on edge at the front to prevent the fruit from rolling off.

When different varieties are to be gathered, separate shelves should be set apart for each kind, the name being placed in a conspicuous position, that there may be no mistakes made.

The oranges should be gathered on a clear, dry day, after

the dew has dried off of them, and arranged carefully on the shelves, one tier deep only, and not pressing against each other.

Here they remain from four to six days, or longer, if desired; when the skin feels dry and firm they are ready for sorting and packing.

No one who has tried the drying process, as above, will any longer feel a doubt as to its infinite superiority over the old method of sweating. The last method toughens the skin by evaporating in a quiet, natural way, the watery fluid. The sweating causes a heating, fermenting action, totally opposed to nature, that expands the cells of the skin, and at once starts a decay, which very often does not appear outwardly until the orange is many miles on its way to market, and thus the fruit arrives in bad condition, very likely does not even pay expenses, and then the grower tears his hair, and more than half the time blames the transportation companies (who have sins enough of their own to carry), for what is entirely due to his own ill-advised treatment of his luscious fruit.

A plump orange, in good order, as when picked from the tree, may be laid away in a dry, well-ventilated place, and will keep good for months in perfect condition, its skin finally shriveling and hardening, yet the fruit remaining juicy and sweet; but place alongside of it one that has passed through the sweating process, and very soon it will soften and become a decomposed mass of pulp. We have tried both processes, and "know whereof we speak," as do hundreds of others. In the light of this new process of curing oranges the old method of sweating will quickly become obsolete, and when all our growers awake to this truth, and also to the fact that our golden fruit can be kept for months in perfect order for shipment, if only proper care is taken in the gathering and handling, so that no bruise shall start decay before the aqueous fluids have evaporated. When they awake to these things then will thousands of dollars be saved to them annually.

Impress on all who are employed in gathering the fruit that now, when it is plump and full of moisture, the least fall or blow will be the signal of decay. An orange will bear five

times as hard usage after drying as when fresh from the tree.

The operations of sorting and packing are, as we have intimated elsewhere, of so vital an importance to the grower, as affecting his profit or loss on his entire crop, that if he is unable to perform them with his own hands, he should at least attend them personally, and keep his eyes wide open.

Oranges of one kind and one size should go in one box; not all sizes mixed together, as we have often seen.

After being assorted, not only with regard to size, but also as to bright or rusty, or half rusty, each orange should be wrapped in a square of the manilla paper that comes prepared for the purpose, already cut in graded sizes for wrapping the various grades of oranges.

This paper can usually be obtained from the nearest store, but always at Jacksonville, as can also the boxes for packing. These last contain two cubic feet, inside measurement, with a middle division. They are delivered to the purchaser unmade, the various pieces being put up in bundles, ready for nailing together.

In making these up, one side, rather than the top, should be left off for greater convenience in packing the fruit, which should be in layers, close together, so they will not shake about. The top layer should project from a half inch to an inch above the box, that when the side is nailed on it will press down firmly, and so tighten the whole box, and prevent jarring, even after the fruit has shrunk, as it will, inevitably, before reaching a distant market.

Be extremely careful to throw aside every specked or defective orange; two or three in a box will ruin the whole lot.

Let the oranges in every box be, as nearly as possible, of uniform size, color and texture.

The boxes containing large, fair, smooth-skinned fruit, should be marked No. 1, large; coarse fruit, No. 2, large; next size, with smooth, bright skins, No. 2, small. Rusty oranges, or half rusty, should be marked No. 2, large, or No. 2, small, as the case may be, with the word rusty or half rusty, affixed.

The number of oranges should always be plainly marked on the box, and each shipper should have his own stencil brand by which his fruit may be known at a glance.

When he has made a reputation among the dealers for good packing and a uniform quality of fruit, as marked on the boxes, he will then find no difficulty in obtaining the best prices for his crop, as his brand will be sought for and picked out by those who are willing to pay for honest fruit.

CHAPTER XIII.

ABOUT VARIETIES.

In selecting the best varieties of orange trees for a grove there is more need for the exercise of sound judgment. Some oranges ripen early; others, late in the season. The fruit of some trees is large; of others, small; of some, rough-skinned; of others, smooth.

The point is to select such as will come into market at the best time, and such as will present the most attractive appearance.

The first object may be obtained by planting a number of the earliest and latest ripening varieties, that may be placed on the market just at the time other oranges are scarce, and therefore bringing the highest prices. The second point is met by having the fruit of medium size, or rather over medium size, and the skin smooth.

A grove of trees one-third earliest, one-third medium, and one-third of the latest maturing sorts, will bring in its owner much larger profits than one where the trees have been selected hap-hazard, without any regard to the two important points just mentioned.

The first among early oranges is

BEACH'S NO. 1.

This is a very sweet fruit, of a rich high flavor, is nearly round, and has a very dark orange color skin; it stands shipping finely, and has no equal as an early orange. Time of ripening, from September 15th to October 1st.

BEACH'S NO. 2.

Is above medium size, rather pear-shaped; eating qualities same as above; is a fine shipper. Ripens November 1st.

CHARLEY BROWN,

Is of excellent quality; a strong rapid grower; nearly thornless; greatly flattened at stem and blossom ends; circumference very large. Ripens in October and November.

ST. MICHAEL.

A fine, delicate-flavored fruit, pear-shaped, of a pale yellow color, thin skin, and medium size; one of the earliest to fruit for budding; is very prolific, so much so, as in many cases to dwarf the tree. Ripens in October and November.

BEACH'S NO. 3,

Has a peculiar tender pulp; pleasant acid when ripe; a favorite sort; size, medium; color, light orange; shape, flat from stem to blossom end; a fine shipper. Ripens in December.

Extract from the report of the Pomological Committee of the Florida Fruit-Growers' Association for 1878: "After comparing and testing, in the most thorough and impartial manner, a large number of varieties, your committee feel warranted in recommending for general cultivation the following: Homosassa, Magnum Bonum, and Nonpariel.

"HOMOSSASSA.

"Size, medium, somewhat flattened, very heavy; color bright, skin remarkably tough and dense, but one of the thinnest; pulp fine, sweet, vinous flavor.

"MAGNUM BONUM.

"Size, large to very large, flattened; color, light orange; skin smooth and glossy; pulp, tender and melting, sweet and vinous; fruit, very juicy and heavy.

"NONPARIEL.

"Size above medium, rather flattened; color, true orange; pulp, tender and juicy; flavor, sub-acid and vinous."

NAVEL ORANGE.

This peculiar orange is also known in Florida as the umbilical, Bahia, embiguo, and seedless orange.

It is well to know that there are two distinct varieties of the navel orange: one was imported into California from Australia, the other was brought from Bahia by the Department of Agriculture at Washington.

The latter is in every respect the superior, and in California is known as the Riverside navel; the former is called the Australian navel.

The navel, Bahia, etc., of Florida, is identical with the Riverside navel.

The tree is not very thorny, and is a good grower and early bearer, frequently bearing fruit the second year after budding even on small stocks. Size, large to very large; color, dark orange; has a protuberance on the blossom end; hence its name and trade-mark; stem inserted in a shallow-ribbed cavity with deep lines; skin smooth and glossy; pulp, melting and tender; juice sweet, sprightly, and aromatic; first quality. Ripens in January.

TANGIERINE.

This is the general name of a peculiar type of orange, which is well known as the kid-glove species. Some botanists regard it as a distinct species, while others contend that it is merely a marked variety of the sweet orange.

MANDARIN.

This is a very beautiful tree, distinguished by its small lancolate leaves and slender flexible branches, which cause it to resemble the weeping willow in appearance; is rather dwarfish, and of a formal habit of growth; the flowers are volute, and smaller than those of the sweet orange.

The first fruit is small, flattened; skin of a deep saffron color, and so loosely adhered to the rind that it may be pulled away, and the pulp, which is very aromatic and pleasant, may be eaten without soiling one's gloves; hence the popular name of this type of orange.

CHINA ;

Or, as it is sometimes called, the *Willow-leaved orange*, or St. Michael's Tangierine. Tree, dwarf, with willow-like foliage, remarkably hardy. A very ornamental and desirable species ; the fruit is small, flattened ; skin thin, and of a deep yellow ; loosely adhered ; pulp, dark orange color, spicy and aromatic.

MORAGNE'S TANGIERINE.

Tree largest of its family ; size and foliage more nearly resembling the sweet orange ; fruit large, flattened, of a deep crimson color ; skin adhering lightly to pulp ; juice sweet and aromatic, and superior in quality to the rest of this type, except Satsuma.

BIJOU ;

Or, as it is often called, Dancy's Tangierine. This is a seedling of the Moragne Tangierine, and resembles it closely, except that the fruit is of superior quality. The tree is a strong upright grower.

SATSUMA.

This is another of the kid-glove oranges only recently introduced, and it is destined to take high rank as a table and dessert fruit. It was brought to Florida from the Island of Kimbin, Japan, in 1874 and in 1878, and takes its name from one of the chief cities of that island. The tree is thornless, the leaves peculiarly thick, lanciolate, medium size, petiole linear.

The fruit is medium size, flattened ; skin, deep orange color, smooth and thin, easily detached ; pulp, dark orange ; segments part freely, fine grain, tender, sweet, and delicious ; best in quality of the kid-glove family.

This tree has one quality which will render it a valuable acquisition to our list of oranges—it is remarkably hardy. During the cold winter of 1880, the cold wave of December 25th, which injured so many trees in the northern and central portions of Florida, the Satsuma stood unharmed. On Fort George Island, near the mouth of the St. John's River, where the Satsuma was first planted on Florida soil, lemons, limes, and shad-

docks suffered in fruit and limb ; sweet oranges lost their leaves and young tender growth, while the Satsumas, close by their side, did not suffer in the least, either in fruit, leaf, or branch, the leaf not even turning yellow or dropping ; and in January, 1881, the same experience was repeated.

This closes the list of kid glove or Tangierine varieties, which are all favorite market varieties, and figure largest at balls and public banquets.

And now we come to the latest ripening varieties :

BEACH'S NO. 5,

Is the largest orange grown in the State ; pear-shaped ; skin, smooth ; dark orange color ; pulp, tender and sweet ; fine shipper ; tree very prolific ; is the only orange that makes a full crop every year. Ripens in February, when it blooms again for next crop.

ACIS.

One of the finest late varieties ; of large size and very fine quality. Tree, a very strong grower.

HART'S TARDIFF ;

Or, *Hart's late*, as it is sometimes called ; skin smooth, with deep pits ; color, pale yellow ; sometimes seedless, at others has from one to five seeds ; pulp, sweet, juicy, with a brisk, racy flavor. Ripens late in January, and will keep in perfect order on the tree till July or August. A good fruit for market.

PHILLIPS' BITTER SWEET.

Fruit, large ; skin thin ; pulp tender, juicy, and sub-acid ; slightly bitter and aromatic ; an excellent summer fruit ; the tree is thornless ; is a hybrid between the sweet and sour orange. Every grove should have a few trees.

MALTESE BLOOD.

Fruit, large, sweet, juicy, and seedless ; takes its name from the peculiar color of the pulp, which is blood-red in flakes when

half ripe, but entirely so when ripe. A favorite fruit ; the tree is thornless.

There are many other varieties of the orange cultivated in Florida, but these are the most widely known and highly esteemed, and a wise selection from those we have named will be all-sufficient to secure an ample reward of the golden fruit.

CHAPTER XIV.

MISCELLANEOUS.

In closing our remarks upon the culture of that golden fruit, the orange, we should leave it incomplete did we not gather in a few "odds and ends" of ideas and experiments that are floating about, here and there, in connection with this interesting subject.

One of these is the question of "overproduction," which seems to be disturbing the mind of many superficial observers. We say superficial observers, advisedly, for those who take a second glance into the matter know such a thing to be impossible.

Orange culture can never be overdone in this country; the markets can never be so glutted as to make the prices obtained unremunerative.

And why? Because the extent of country where oranges (and lemons) can be successfully grown is very small compared to the extent of country ready and willing to purchase them.

In the Mediterranean countries you see all the people eating this Queen of Fruits; they have been educated to consider it as a necessity, as a part of their daily food, to be bought in preference to other food, if there is not money enough to purchase everything desired; a beggar will buy oranges and go without meat.

The people of the United States do not appreciate the full value and health-giving properties of the orange as an article of food; it is eaten now rather as a luxury than a necessity; but they are just coming to a truer appreciation of its real value, and before long the voice of one of our most eminent physicians, who has said that "if each of his patients would eat an orange before breakfast his practice would soon be gone," will be re-echoed all over the land.

There are thousands of persons in the United States who have never seen an orange, and other thousands who never obtain one, except at almost prohibitory prices.

Some day, as the number of the oranges placed on the market increases, these people will be reached, and oranges placed in their hands at the prices for which the more fortunate citizens of our Eastern cities obtain them at present.

It is quite true, as often stated, that thousands upon thousands of orange trees are being planted all over Florida; but it is safe to add that fully one-third of those planted will never come to bearing maturity; many will fail from wrong treatment; many will be abandoned by non-persevering owners, and many more will die because they have been planted too far north, and their strength will be exhausted by too frequent frosts.

But even supposing that every tree planted came to maturity and bore its load of golden fruit, and that every foot of ground on that one-twentieth part of Florida, which is all that can be utilized for orange culture, should bear its dozen oranges, what would all that amount to when divided among the fifty-three millions of inhabitants of the United States, such being the population of the past year, 1882—a population immense now, and doubling every thirty years? The population will increase almost indefinitely; the year 1940 will witness a population in the United States of more than two hundred millions. But nature has fixed the limit of the orange-bearing belt in the United States, and nature's laws are irrevocable.

The vast markets of the West and the North-west have never yet received an adequate supply of oranges, and it will be many years before the supply will meet the demand.

Florida oranges are admitted to be superior to any other in the world. and for this reason, although their numbers are yet comparatively few, they occupy the foremost place, and are eagerly sought for at the highest prices.

The genial climate of Florida, and a soil peculiarly adapted to the growth of the orange, coupled with the long period of warmth and sunshine, perfect and concentrate the juices without destroying the aromatic flavor.

These advantages, joined with a proximity to the great markets, which allows the fruit to remain on the tree until ripe,

gives, and always will give, the first rank to Florida oranges in the United States.

If the orange growers of Europe find it to their advantage to ship their inferior fruit to America, the expenses of freight, commissions, and a tariff (secured by General Sanford, of this State, for the protection of home growers)—if, we say, the European growers still reap a good profit, in spite of their drawbacks, what should not the home grower reap, with better fruit, lighter freights, and no tariff?

Those who only see the tempting-looking Mediterranean fruit, as set forth for the inspection of the retail consumer, have a very feeble conception of the real extent of the business, or the frequent losses to the shippers. To those who do know, the wonder is that the foreign growers still persevere in sending their fruit so far to meet with such frequent losses.

Quite often the loss from decay on cargoes from the Mediterranean and the West Indies amounts to fifty, seventy-five, or ninety per cent. In many cases not enough is realized from the cargo to pay the freight.

When, however, the cargo arrives in good order, its sale often gives the owners a good profit, and so they keep on after each reverse, hoping for better luck next time.

Nor would these profits accrue to the foreign orange as often as they do were it not for a trick of the trade adopted by some dishonest dealers.

Knowing the eagerness with which Florida oranges are sought, they select the best-looking foreign oranges, usually those from Valentia, in Spain, mark them Florida, and sell them as such to unsuspecting or ignorant customers.

In New York alone, during the Christmas holidays, over fifty millions of oranges are sold, and nearly all of them are labeled, "Florida oranges." One of the largest dealers in New York, who largely supplies the Washington and Fulton markets, tells us frankly that all of the best imported fruit is labeled "Florida" to meet the popular demand.

The day is coming, however, when the superior orange of Florida will drive the inferior imported fruits out of the markets,

and there will no longer be a temptation to deceive the consumer.

It is quite likely that the prices of Florida oranges, as ruling at present, will fall somewhat in years to come, but they will probably never fall so low as not to be remunerative.

Even supposing that the impossible should become possible, and the United States should find more oranges raised on her soil than she could consume, with profit to the grower, there is England ready, as has been proven by actual experiment, to buy our oranges at a higher price than she gives for the sour Mediterranean fruit—a price that yields a handsome profit to the producer; but we shall never, in all probability, have need to seek a foreign market for our oranges.

To further show how preposterous the cry of overproduction is, we will ask how it is that, with the immense area of country devoted all the time in the United States to raising apples, peaches, plums, cherries, there has not long since been overproduction?

So far is this from being the case, and so profitable have these orchards been to their owners, that instead of any overproduction, the people, like *Oliver Twist*, call for “more, more;” and the demand for nursery stock to set out new orchards is considerably on the increase, although in these fruits nearly all the States are competing with each other, and are able to raise their own temperate-climate fruits on their own soil.

Overproduction of oranges! when there are just as many people waiting to consume the Queen of Fruits, as there are to consume all the apples, pears and peaches raised on ten thousand times the area.

The question that faces the orange grower is, how to supply the future increasing demand.

Superior varieties of fruit will always bring superior prices; a fruit with a known name and reputation will rank higher than one unnamed.

An experienced orange grower said: “Seedling trees are generally eight to ten years coming into bearing, and no two

trees in a grove are sure to produce alike, or of as good a quality. While we only get twenty dollars a thousand for seedling and unnamed varieties, we get from forty to fifty dollars per thousand for our select varieties. The sooner orange growers understand this the better it will be for them."

Even supposing that the price of oranges should drop to ten dollars per thousand, which it is not likely to do for the best qualities, the grower would still realize as follows: Given seventy trees to the acre, and each tree bearing only five hundred oranges, that would be five dollars a tree, or three hundred and fifty dollars per acre; so that a ten-acre grove at these moderate estimates would give an annual income of thirty-five hundred dollars.

Can you find ten acres North that will give so good a return to the farmer? except, perhaps, a specialty like cranberry raising, for which but little land, comparatively, is available.

Having, as we trust, laid the ghost of overproduction to rest, the next point for consideration is a method of inducing barren trees to bear. That has only lately come into vogue among our more progressive orange growers, and is still undreamed of by those who prefer the old time-worn groves.

It is not a new method, having been practiced for years past in many places, and upon many kinds of fruit trees, with uniform success.

In all groves or orchards, of whatsoever kind, will be found here and there trees that flourish and grow thriftily, yet bear little or no fruit. These are termed barren trees; and the method we have referred to is designed to produce fruitfulness in these lazy, ne'er-do-well of the vegetable kingdom.

There are a good many orange trees at the present time, scattered about, which are old enough, and thrifty enough, but never bear a crop.

Girdling a non-productive tree in order to retard the flow of sap, and encourage the formation of fruit buds rather than wood, is the method we have mentioned, and though only now coming into extensive use, has been known and practiced by pomologists for the last hundred years.

It is rather curious that we girdle a tree to kill it, and girdle it to make it live and be useful.

But in the one case we cut deep through outer and inner bark; in the other, we carefully remove a ring of the outer bark only, from one to three-eighths of an inch wide, cutting entirely around the tree, or branch, if we only desire to try the experiment on the latter.

A knife or small saw, with the teeth set wide, will do the work effectually.

There is an apple orchard out West where alternate rows of young, unbearing trees were girdled, and two years after they were loaded to the ground with the finest fruit, while the rows between them, of the same age, not girdled, had not a single apple on them.

This practice of girdling is both rational and effective, and is destined to give the intelligent fruit grower considerable command over his trees.

When early bearing is desired the ring of bark should be removed, while the tree is growing, during the previous year. For early ripening and increased size of fruit, girdle just after the fruit has set.

Another way of girdling, which we prefer, consists in winding wire two or three times tightly around the tree, so that the return flow of sap will be retarded.

Still another way of inducing barren trees to bear, is to drive into the trunk a circle of nails, close together; this has the double effect of girdling the bark sufficiently to retard the sap (which always leads to the formation of fruit), and of introducing into the body of the tree an element which is as needful to vegetable health as it is to human—namely, iron.

Yet another method of inducing fruit was discovered in rather an amusing way some years ago: A high-tempered man became angered at two of his neighbors, and as they would, in all probability, have objected to his relieving his feelings by beating them, he went into his garden, where stood two thrifty old plum or pear trees that had never borne fruit. These trees he named as his obnoxious neighbors, and taking up a club,

soothed his feelings by giving their tree-namesakes a tremendous drubbing. This was in the summer; the trees did not grow quite as fast as usual, and the next season, for the first time, they bore large crops of fine fruit. Investigation proved that the whipping they had received had bruised the bark so as to retard the flow of sap, just as if they had been girdled.

Girdling orange trees by any of these methods should be done from June to September, when fruit is wanted for the next year; and to make large and early fruit, late in March or early in April.

The China berry tree is said to be a great fertilizer, when planted in the "diamonds," between the orange trees. It profusely drops its foliage, adding a rich humus to the soil. It will abundantly fertilize the soil for a space of thirty or forty feet around it.

From Australia comes a voice that is echoed from many parts of Florida, saying, "We have found, not the remedy, but better still, the preventive for the scale insect." What is it? A tree that has been making considerable stir in the world of late, because of its anti-malarial and draining properties, the Eucalyptus.

It is a well known fact that insects dislike the smell and taste of this remarkable tree, and it has never been known to be attacked by any of their mischievous race.

Who does not know the peculiar aromatic odor of the Eucalyptus; and from afar the winds waft its perfume? Place some of these trees among your orange trees—the more the better—if your land is inclined to be too moist, and whatever orange trees are near enough to get the benefit of their odor, will be free from insects, even though others around them may be infested with them. This is especially true as regards the scale insect, which appears to have a very great dislike to the Eucalyptus tree.

It is also claimed that strips of the bark of this tree, tied around the trunks of other trees, will keep insects at bay, just as a few of its leaves scattered about the floor will drive fleas away.

These assertions being true, we should judge that a wash made of a strong effusion of Eucalyptus leaves, or bark, would be a very effectual weapon wherewith to fight our insect enemies.

CHAPTER XV.

LEMON CULTURE.

All that has been said in these pages regarding orange culture will apply equally well to lemons, with a few slight modifications.

One of these differences relates to pruning; as we have seen, the orange tree will admit of considerable lapping off of its branches, and with benefit. The lemon, on the contrary, resents any such meddling with its branches, unless they are dead; then, of course, they must be removed.

One single cutting away, especially of the lower branches, that nature intended to shield its trunk from the sun and wind, will put back the tree from one to two years in growth, and seriously affects its vigor and health.

We remember a case in point: A gentleman had one especial lemon tree near his house, and wishing to make it an ornament to his grounds, determined to curb its straggling propensities, and "train it in the way it should go." With knife, saw and shears, he pruned and lapped, until the tree had assumed the desired symmetrical proportions—tall and rounded, its trunk smooth and bare, instead of being well nigh hidden by sheltering foliage.

The tree was expected to bear fruit the next season, but it did not; it devoted its energies to replacing its lowermost branches. Carefully they were pinched and pruned away; not a very arduous task was this, either, for the growth was weak and slow; then the leaves turned yellow, new shoots were scarce, and the whole tree assumed a sickly appearance.

Still the true cause of the trouble was not even surmised, and once more the limbs were cut back; another year, two years, and though the tree still lived, that was all it did do; a few weakly blossoms came straggling out, gave a weary, hopeless sigh, and sank to the ground.

Then the owner of the tree resolved to cut it down, root and branch, but the gentle housewife pleaded for its existence; it was near the dwelling, and sickly as it was, it gave some needed shelter.

"Very well, then, let it stay; but I'll do nothing more with it. I'll let it alone entirely."

So it was "let alone," and that was the greatest boon that could have been granted that unhappy tree

Slowly and cautiously, as though fearful of attracting attention, and hearing more sharp, cutting remarks on its behavior, it put forth new branches low down on its trunk. They grew on until their drooping leaves shaded it once more; then the top took a start, and all through the season it grew, becoming more and more vigorous. In the spring it set a hundred or more fine lemons, and the next year bore a heavy crop—just because it was "let alone."

Again, while orange groves may be planted with profit on hammock lands, a lemon grove cannot. The trees will not flourish at all in the hammocks; we do not know why. No explanation of the cause has ever been given; but the fact remains, even with regard to high hammocks.

The lemon requires a dryer soil than the orange; hence some locations that suit the latter will not answer at all for the former. The quality of the soil, however, is not of so much importance for the lemon tree as it is for the orange, the latter being a grosser feeder. The lemon will grow well and thriftily, where its more epicurean sister would languish for want of food.

As a rule, the lemon tree is less hardy than the orange—a degree of cold that does no harm to the latter, wilts the young growth of the lemon, and causes its leaves to drop. There is an exception to this rule, however, as we shall see presently, when we come to note the different varieties.

The culture of the lemon in those of the United States adapted for its growth—Florida, Louisiana, and Southern California—has not yet received the attention due to its national importance; on the contrary, it has been greatly neglected.

This state of affairs is largely due to a prevailing opinion

that it is useless to try to compete with the foreign or Mediterranean lemon; and, certainly, the latter is far superior in quality to the orange from the same localities—a fact abundantly proved by recent statistics, which show an enormous increase in the importations during the last few years, and a corresponding decrease in the amount of oranges brought into this country.

Now, there is no reason whatever why the hundreds of thousands of dollars annually sent out by the United States in exchange for this popular and necessary fruit, should not be kept at home, and go to enrich our own citizens rather than foreigners.

The whole trouble has originated—first, in the inexperience of the growers in properly gathering and curing the lemon for market; second, in the general and erroneous impression that the lemon tree is more liable to become diseased than the orange; third, the fact that nearly all seedling lemon trees bear fruit with a rind so bitter and coarse as to be unfit for market; and fourth, in a totally mistaken idea on the part of the growers as to the kind of lemon most popular in the markets.

But, latterly, our people have waked up to the importance of the subject, and these old-time rocks in the sea of lemon culture are being at last blown to atoms before the “Hercules powder” of investigation and common-sense.

The first rock—that of the lemons reaching market in bad condition—has been removed. They used to be picked when quite ripe, packed at once, and sent off, to be found almost invariably heated and rotten at their journey’s end.

But now they may be kept perfectly good for six months or more by proper treatment, and they will improve rather than deteriorate by being so kept.

It is a very simple matter, this preparation of lemons for market, being exactly the same process we have already described as applied to oranges—namely, an avoidance of moisture while curing, by spreading the fruit on well-ventilated shelves, and afterward sorting in grades and wrapping in Manilla paper.

But at the outset there is one point of difference, and this it is which is of paramount importance, involving success or failure. The orange will keep well, even if picked when quite ripe; the

lemon will not. It must be picked when just commencing to turn yellow, and at least one-half of the rind is still green; picked in this condition, it should be kept on the drying shelves for at least six or eight weeks.

This is the secret of curing lemons successfully, as recommended by a special committee of California citrus fruit growers, appointed expressly for the purpose of investigating this important subject.

The second rock that has stood in the way of lemon culture in the United States—the idea that the tree is more subject to disease than the orange—doubtless arose from the pioneer trees having been planted on soil too moist for them, under the belief that wherever the orange would flourish, the lemon should do likewise.

As a matter of fact the latter, in suitable locations, outstrips the orange in the rapidity of its growth, even though on much poorer soil; it is even less liable to disease, and scale insects more rarely attack it. Where an orange tree will bear one thousand oranges, a lemon of the same age will bear from three to five thousand.

It is rather a notable oddity that the first two or three crops, even of the finest varieties, are apt to be coarse and spongy, and totally unlike its after-crops. One might almost imagine the tree to be following the example of the "lords of creation," and "sowing its wild oats" in its youth, before settling down as a staid, demure "dealer in first-class fruits only."

The third rock on which the lemon barque of the United States was erewhile threatened with shipwreck, was the "sporting" tendency of the seedling lemon.

But our growers have learned at last not to put their faith in trees of this class, for, after patiently waiting for years, the fruit, in nine cases out of ten, is worthless. The moral of this is, raise no seedling lemons for their fruit; they make good, thrifty stocks, and that is all they are good for.

Bud approved varieties of lemon, on lemon, citron, lime, or sweet orange stock; the last is best of all, as it renders the tree

more hardy. Never waste time waiting for a seedling lemon to bear, unless you wish to taste of the "Dead Sea Apple."

The mistaken idea as to the popular lemon called for by the public is well set forth (in all good faith, however), by the following extract from a work quite recently published about Florida :

"The tree grows more rapidly, produces fruit sooner, and has larger and better flavored lemons than are found anywhere else. I have seen and picked lemons of one-and-a-half to two pounds in weight, and at the State Fair saw lemons weighing two-and-a-half pounds."

Now, here is the very rock on which many a lemon-laden barque has gone down. Who wants lemons that weigh from one-and-a-half to two-and-a-half pounds?

Not the saloon-keepers; they will not, when sliced, go into their tumblers; not the confectioners, their rind is too coarse and bitter, and the juice too scarce; not the private family, they are too much for one, and not enough for two; in fact, no one wants these monsters, and erewhile our growers were striving to see who could produce the largest lemons that would sell the least. Very large lemons are not only rough-skinned, but their centres are hollow, and the pulp contains comparatively little juice.

This is why the common Florida lemon is good only for home use; it will not sell in the markets, but is valuable to the growers for family purposes, because it fruits early from the seed, is very prolific, bears constantly, blossoms, ripe and half-grown fruit, and buttons just set, all hanging on the tree together.

Growers are finding out their mistake, now, as to the right kind of lemons to put on the markets to compete with the foreign fruit. The latter meets the popular want; therefore, in size, aroma, color, texture of the skin, freedom from seeds, and the absence of bitterness in the rind after being a long time in water; in all these points we have our model ready at hand, and it must be followed if we, of America, would drive out the foreigner.

This same special committee to which we have referred has also pointed out the way to do this; it collected for investigation lemons from all quarters of the globe—Palermo, Messina, Malaga,

in Sicily and Spain; California, Mexico, South America, and Florida.

The appearance of the fruit, its size, quality of rind, percentage of acidity, bitterness, flavor, and quantity of juice, are the points that were made a basis of comparison.

And this was the result of long and patient examination, that a lemon weighing, when cured, about three ounces, with a soft, smooth, golden-colored rind, is the favorite in all the great markets, and will sell readily at the highest prices, where larger and rougher skinned fruit will scarcely sell at all, at any price.

And the directions given, so that this desired quality of fruit may be home-grown, are to discard all trees that after a fair trial continue to show bitterness; to raise no seedling lemons for fruit, and to exercise great care in selecting buds from trees of proved excellence, that are free from bitterness and rich in citric acid.

Some of the budded varieties already introduced in California and Florida were pointed out as well worthy of cultivation, and as already commanding as high a price in the great markets as the best imported lemons.

Of these, Gary's Eureka stands foremost. Of this lemon we are told that it originated from a chance California seedling, and that the original tree, now only seven years old, produced only two thousand lemons this past season, and that many other trees budded from it on orange stock, three years from the bud, are fruiting heavily; and that while the ordinary Sicily lemon brings only ten dollars per thousand in San Francisco, the Eureka brings thirty dollars per thousand. Mr. Gary tells us that he has for years been in search of a truly good lemon, and now he has at last found it, wherefore he cries, Eureka!

And now let us pass on to our notice of the different varieties that have been proven worthy of cultivation, and as we have seen, first and foremost, comes the

EUREKA.

The tree is thornless, a strong grower, and an early and prolific bearer. Fruit, medium; sizerind sweet, no bitterness; a strong, pleasant acid, and seedless.

LEMON OF GENOA.

Introduced from Genoa, Italy. Tree, thornless ; an early and heavy bearer ; fruit, medium size ; sweet rind ; strong, pleasant acid.

SICILY.

Tree a prolific bearer ; fruit, medium size ; very juicy ; skin very thin ; a good keeper and shipper.

FRENCH'S SEEDLING.

Tree a strong grower, almost thornless ; fruit small, rather flattened ; skin very thin, tough, and dense ; pulp fine, juicy, and highly flavored ; fully equal to the imported Sicily.

BIJOU.

This is a superior fruit that has suffered much injustice in this State, owing to the fact that, whether accidentally or otherwise, a lemon really worthless, the Bergamot, has been placed on the market under the name of *Bijou*, the two being very distinct varieties. The true Bijou is the hardiest among lemon trees, and will bear as much cold uninjured, as the orange ; leaf, broad and small ; fruit, small ; smooth, thin skin ; very juicy ; fine acid. Commences to ripen August 1st.

NAPOLEON.

Prolific bearer ; fruit, medium size ; thin rind ; very juicy ; shape, oblong ; excellent for shipping.

AUGUST.

Tree, a rapid, vigorous grower ; new growth, deep purple ; fruit, medium size ; smooth, thin skin ; fine acid ; shape, elongated ; a splendid shipper. Ripens August 1st.

VARIEGATED.

Strong grower ; leaves mottled with white ; pale straw color, and several shades of green ; very ornamental ; fruit, smooth, thin-skinned ; fine acid ; medium size ; very superior.

CHAPTER XVI.

CITRUS FRUITS.

LIMES.

Next after the orange and lemon, the lime ranks as the most important member of the celebrated citrus family, and the day is not far distant when the hitherto modest lime will step forward and assert itself as the full equal of the lemon.

The production of limes in quantity is one of the latent interests that will spring up in the near future of Florida.

The lime tree is an early and prolific bearer, and will bring its owner a revenue more quickly than any other of the citrus fruits.

The lime, which is found scattered over the State, and known as the "Florida lime," is in reality the Mexican lime, and is well worthy of extended culture. It never "sports" like the lemon, but is a quiet, steady-going tree, coming true to its seed always, growing rapidly, and producing abundantly good fruit in poor soil, when only three years old.

Wherever the lime is introduced it receives a warm welcome; its acid is more pleasant than that of the lemon; its juice far more abundant in proportion to its size, and being smaller than the lemon, is highly esteemed, and, in fact, preferred before the latter for hotel, saloon, and culinary uses.

Pickled and preserved limes are justly celebrated, and a jelly made of limes is also delicious.

With all these points in its favor, how is it that comparatively so few limes are planted?

There are two reasons, we are told. First, because the lime tree is the most delicate as regards cold, of the citrus family, and is often touched by frosts. Second, because the fruit does not ship well. And third, because the prices they bring in market are not as great as those for oranges or lemons.

Granted—the first reason; but the injury done by the cold in South and East Florida is, after all, infrequent, and rarely amounts to more than killing the tender new growth which the lime is ever putting on, regardless of season, drought, or poor soil, and this does not really hurt the tree. It is true that the area of successful growth of the lime is limited; all the better, then, for those who dwell within that area, there is no danger of their enterprise being overdone.

Here, in Sumter county, two or three winters ago, the thermometer several times sunk to 31°, and once or twice to 28°, but the limes survived; only the young growing shoots were killed, and it is rare, indeed, that the cold touches such low degrees in this locality.

Therefore, South and East Florida may pass by this first reason for non-cultivation of the lime, as of minor importance to them, at least.

Now, for the second—"the fruit will not ship well," and move an amendment: "It *has* not shipped well;" and, then, we grant this, too. But this is not the fault of the fruit, no more than that of the sweated orange, which, started on its downward journey by heedless or ignorant hands, reaches its destination in an unsaleable condition. This frequently happens, yet we never heard any one say that the "orange will not ship well," nor does any one refuse to set out groves of the same on this account.

The truth is, that limes will ship just as well as its kindred fruit, the lemons, if picked only when quarter or half ripe, cured on drying shelves, and packed just like oranges and lemons.

But we have never known a single instance where this ordinary care has been taken with the lemon. It has never had a fair chance given it to reach its market in good condition.

Nor is the absence of the curing process the only trouble, as a prominent grower plainly puts the case:

"Our producers have not selected their fruit. They have not sent to market only first-class fruit; but have sent instead a heterogeneous collection of large, small, ripe, green, and in some instances, from sheer carelessness, half rotten fruit. Of

course, the merchants returned account of sales "*nil.*" I will say, in this connection that I have just received account sales of my last shipment of limes, returning me net, seven dollars and forty-five cents per thousand, and written on the margin was, "Good, well-selected limes looking up."

This tells the whole story: Prepare and pack limes properly, that they may be fairly introduced into the great fruit marts, and the convenience of using them, as compared with the large lemons, will soon make them formidable rivals to the latter.

A citric acid manufactory, to take off the "culls" of our lime trees, would be a great boon to this State, and put thousands of dollars in the pockets of the people very speedily, for there is no tedious waiting for ten or twelve years for limes to come into profit. Commencing to bear at their third year from the seed, they rapidly increase in bearing capacity, until, when they are twelve years old, they bear from three to five thousand limes.

Now, suppose one hundred seedling orange trees and one hundred limes to be set out at the same time, at twelve years of age, the one hundred orange trees, carefully cultivated and fertilized, will yield little, if any, income. The one hundred lime trees, much neglected and unfertilized, will be each bearing, say, three thousand limes. Suppose they sell for only three dollars per thousand, net; well, here we have an income of nine hundred dollars for the hundred lime trees, occupying less than one acre of ground.

The lime tree is of low, bushy habit, and does not so deeply resent trimming up as does the lemon. Tall, upright trees, with smooth, bare trunks, have been shaped from the lime; but it is better to let nature take her own way, and she intended the lime to be a tall, pyramidal bush, rather than a tree. All that is desirable is to prevent the lower branches from lying on the ground, and to trim out the centre so that air and sunshine may reach every part.

In raising seedling limes, always select the seed from the largest and most perfect fruit, as the fruit from this is sure to be of the same quality as the parent. There are only two or three qualities of the lime, and these are the

FLORIDA.

Introduced from Mexico, and known in California as the Mexican. Fruit, medium size; skin, smooth and thin; juice, acid, rich and abundant; the best for general cultivation.

SWEET, OR DULCIS.

Large, thick-skinned, pulpy; valued only as a variety, and for preserving.

PERSIAN.

Lately introduced, a very superior sort. Fruit, large, and often exceeds the ordinary lemon in size; juice, a very pleasant acid; pulp, tender and seedless.

THE CITRON.

The citron, like the lemon and lime, is more susceptible to cold than the orange, and is the least esteemed of the citrus family, with the single exception of the shaddock. The tree is rather dwarfish, attaining the height of eight feet; is erect and irregular in growth, and has many drooping branches, with short thorns.

The fruit is quite large and heavy, and of several varieties and shapes. In Florida but two kinds are extensively known, but in Europe six varieties are cultivated: the common, the flat-fruited, the forbidden-fruited, the round-fruited, and the thick-leaved. In all these sorts there are two rinds—the outer one thin, with miliary glands, full of a very fragrant oil—the inner thick, white and fungous. It is for this thick rind only that the citron is valued, it being used extensively in confectionery, both in its candied and “preserved” forms. The United States has always received its supply of candied citron from abroad as it has been supposed that the fruit, as grown here, could not be as well cured as the foreign grown.

This idea has lately, however, been proved to be incorrect, and now, in San Francisco, we find a wide-awake firm advertising for all the citrons that can be raised in California, and that, too, at good paying rates to the grower.

In Florida some of our energetic house-keepers have been quietly experimenting, and the result has been a better and finer article than the imported candied citron, bringing the highest price whenever placed on the market.

The sooner our people realize that there is money in citron, the better it will be for them. The fruit is easily prepared for market and is very profitable. The tree is readily propagated from cuttings, which bear fruit in two or three years. It also grows readily from seed. The varieties grown in Florida are the

ORANGE,

Shape, round like an orange; size, large; skin, pale yellow, rough and glossy; inner skin, white, coarse and thick; a very desirable variety.

LEMON.

Shape, oblong like a lemon; size very large, weighing from two to eight pounds; skin, light yellow, rough and glossy; inner skin thick, spongy and aromatic. The best sort for general cultivation.

SHADDOCK.

The shaddock is a strong, thrifty grower; its general appearance closely resembles the orange; its leaves, however, are larger, and have a broad-winged petiole, and its habit of growth is more irregular and spreading; the fruit is very large, and not greatly esteemed, although the sub-acid juice is very refreshing. It ripens in the early winter, and continues on the tree in good condition until May and June. Varieties are:

Mammoth.—Fruit, very large; skin, smooth, glossy, pale-yellow; rind, thick, spongy, and bitter; pulp, green, watery, and sub-acid.

Blood.—Resembles the mammoth, in all respects, except that the pulp is red, and the flavor of juice is more delicate.

Grape Fruit or Pomolo.—This fruit is held by some to be a distinct species, but it is, no doubt, a variety of the shaddock, and the most esteemed. Fruit is pale yellow; small, compared to the other varieties of the shaddock; skin smooth, rather thin; pulp, sub-acid and very refreshing, with a decided grape flavor; hence, its most popular name.

CHAPTER XVII.

PINE-APPLES.

Next in importance to the culture of oranges and lemons in Florida, and destined to rival even these fruits in the future, comes the pine-apple, most fragrant of all fruits, and second to none in delicious flavor.

This industry, like those just mentioned, is still in its infancy here, and, consequently, there are many conflicting opinions as to the best soils and modes of culture.

From a mass of opinions on this subject we have endeavored to sift out facts, and to recommend a mode of culture which may be relied on as safe to follow, and reasonably certain to lead to success.

One writer on pine-apple culture tells us that "the best soil for them is new, rich land, closely underlaid with clay;" another says, "the soil should be very rich, and is better to be all clay;" while others recommend rich hammock land.

Now, all this may be true in certain places and latitudes, but it is not true in Florida.

Pine land gives the best result in every instance upon record, and it needs but little fertilizing either.

It is a mistake to suppose the pine-apple needs a very rich soil to do its best; it is a plant that wants only moderate food, and is easily surfeited, and its growth actually retarded by too much fertilizing; and in this fact lies the secret of the failure of nearly all who have not succeeded in raising this delicious fruit successfully.

Rarely, indeed, is the man who set out his pine-apple plantation on rich hammock land found extending it—at least not on the same soil—while, whenever a patch has been started on pine land, and moderately cared for, you will find the owner

preparing to plant more and more, in sheer delight at the "treasure trove" he has discovered at his feet.

Even the poorest pine land, with a yellow sub-soil close to the surface, has been proved to give better plants and larger fruits than rich hammock land adjoining.

Another mistake that is not made now so frequently as it used to be, was setting the plants on moist land. The pine-apple is closely allied to air plants, and therefore is not only a moderate feeder, but also a moderate drinker; its long narrow leaves draw no small share of its required nutriment and moisture from the air, leaving the roots little to do.

Pine-apples, unlike most other fruits, are not propagated from the seed, for it is a singular fact that not more than one fruit in a million of the cultivated varieties contains a single seed; hence, if compelled to depend on seeds for their increase, we should be badly off indeed. When seeds are found they are regarded as great treasures, and carefully planted; for, from this source only, can new varieties be obtained; sometimes they prove valuable, more times not.

The pine-apple plant, like the banana, bears fruit but once, and then dies down; if the old root is left in the ground, suckers rise up from the axes of the leaves near the ground.

As soon as these attain a sufficient size, the root should be lifted and cut, with one sucker to each piece, and these pieces set where they are to stay.

At the top of the fruit is a crest of leaves, called the crown, and surrounding this, at its base, are other tufts, called crowdllets; while at the base of the fruit itself, surmounting the stem upon which it grows, are still other off-sets, termed slips. Upon the stalk which bears the pine are "eyes," which, treated like grape cuttings, are also used to increase rare varieties.

From these sources suckers, crowns, crownlets, and slips and eyes, pine-apples are easily and abundantly propagated, and these are usually sought after in the order named, from the idea that suckers fruit first, crowns next, and so on.

This, too, however, has been shown to be an erroneous impression; the fact is, that the size of the plant alone governs its

fruiting. Give them a large sucker and a small slip, and keep them growing equally fast, then, of course, the sucker will fruit first, the slips last; but reverse these conditions—take a large slip and a small sucker, and the slip will be the first to yield up its luscious treasure.

It is of no advantage to send to a nursery or elsewhere for ready-rooted plants. Get as large-sized plants as you can to start with, but any roots that they may have before coming into your possession you may count as *nil*.

Pine-apple rootlets are of so tender and perishable a nature that even if they survive transplanting, they will be longer in reviving and going to work again, than new roots will be in forming and taking hold; consequently, rooted plants are no desideratum.

It is a very easy matter to root suckers, crowns, crownlets, or slips after you have them on the ground ready for planting, and it is better to start them on their rootward journey before setting them out in their permanent places.

As a preliminary, carefully pull off the overlapping leaves at the base for an inch or half inch, according to the size of the offsets: this will facilitate the rooting process; then make a bed of damp moss, keep it damp, and place them, base downward, in it, just as you would place them in the ground when planting; cover them with more moss, not damp, and place them in a shady spot.

After they have lain thus a week or two, examine them, and plant out those that have sent forth slender white rootlets a half inch or more in length; some will take several weeks longer than others to do this, but it is best to wait their time before setting them out, and they will grow off more surely and thrifty by this method than by any other.

Some planters recommend leaving the offsets exposed to the sun for weeks, or even months, to facilitate rooting; but while the plants will really root under this heroic treatment, it is at the expense of their ultimate thrift, and the rooting in the damp moss and in the shade is by far a better plan, and one that makes a certainty of the after well-being of every offset; not one will be lost by this method.

But no matter how the plants are rooted, it is necessary to see that after being set out they do not lack moisture until thoroughly established—a period that will be known by a wider opening of the offset in the centre, and new leaves appearing there; after that they may be mulched when the soil is moist, and left to take care of themselves, so far as moisture is concerned.

In preparing ground for a pine-apple plantation, parallel lines three feet apart should be laid off, and a compost of well-rotted stable manure and muck, or leaves, or muck and bone-meal, spread in along these lines for a width of about eighteen inches and a depth of one foot.

The trenches thus prepared should be settled by one or more heavy rains before setting out the plants. The latter should be placed two feet apart, not closer, to insure each plant plenty of room. Too close planting will, of a surety, stunt both plant and fruit.

In the West Indies and Bahamas, the growers plant close, to keep down the weeds, and they succeed admirably in keeping down the fruit also. They plant from 20,000 to 25,000 on an acre: this is why we see so much small and inferior fruit thrown on the American markets.

Planted as the experience of our leading Florida growers recommend, as given above, an acre will contain, say, 6,500 plants; these, at twenty-five cents for each fruit, will bring their owner the respectable sum of \$1,625—no mean showing as the earnings of one acre of ground; and in addition to this amount of hard cash, must be added its representative in the shape of the suckers, crownlets, and slips that remain after the fruit is ready for market, enough to set out two or three acres of land.

Sometimes fruit is obtained in twenty months, oftener in two years, and sometimes not for three or more, from the setting out of the offsets; it all depends on the care they receive, and, above all, on their proper protection from frost.

Pine-apples, once started, need little care; almost none if the ground about them is heavily mulched, but if not, they should be mulched to keep down weeds, this latter being the extent of their

requirements after being properly prepared at the outset. The question of frost protection is a most important one to the Florida grower, for the plant is essentially tropical, and the least frost injures it more or less; a light frost only kills the leaves, and if the plant is not near fruiting, this injury will only diminish its size, and retard the fruiting season.

But let the plant be large and well on towards the fruiting time, and then if the leaves are killed the fruit will be small and unmarketable, while if water should be standing in the little cup formed by the centre leaves, when a sharp frost sufficient to freeze the water chances this way, woe to the plant itself; its tender life currents will be so chilled and shocked as never more to grow onwards, and the plant will droop and die, to be replaced by feeble suckers.

But there is no need that such mishaps should occur with a careful planter; a slight protection will insure the safety of the pine-apple.

While the plants are small, a couple of sticks—split shingles are convenient for making them—stuck by them, so that their tops meet above the plant, with a handful of the long gray moss so abundant in the hammocks—which, by-the-way, is no moss at all, but belongs to the pine-apple family, and is an air plant—dropped over them, is all-sufficient.

When they become too large for this, two, ten, or twelve-inch boards, nailed together at a right angle, and then placed over the plants like an inverted trough, afford an excellent shelter. If the boards are not over ten feet long, one man can easily lift them into position on the approach of a threatening night, for it is at night that the Florida frosts nearly always occur.

Another method of protection is to drive down low stakes among the pine-apples, to lay small scantling or rails from stake to stake, and on these pile brush, cornstalks, anything that will serve as a shelter; cloths or bagging are also often stretched over the protecting frame-work, and these, though a little expensive at the outset, are really economical in the end, since the one expense serves for season after season, while brush must be collected and removed each year.

Yet, another way of protecting pine-apples, and in fact any plant from frost, is to make ready here and there, but especially to the north and west of the plantation, small piles of heavy timber, with light-wood knots ready for kindling on the approach of frost. Plenty of leaves and dampened brush should also be at hand to cast on the blaze when once fairly started, so as to make a "smudge fire"—that is, one that will give out a sufficient heat while not burning away freely or clearly. The cold winds that sweep Florida once or twice in ordinary winters invariably come from the north-west, and in arranging these protecting "smudge fires," this should be held in mind, and the cold winds made useful by wafting the warmest air just where it is wanted; although, as we have seen, new varieties can only be obtained from those very rare jewels, pine-apple seeds, and not more than one in a hundred of these is of any value, yet by long years of patience and perseverance a number of varieties have been secured.

Of these the following have been introduced and successfully cultivated in Florida, doubtless, others will follow:

SPANISH.

The pine-apple has a bewildering number of aliases, as follows: "The Red Spanish," "Red Pine," because of the reddish tint of its leaves and bloom; "Black Spanish" and "Black Jamaica," because in certain stages of its growth the fruit is very dark, almost black; and last, "Commercial Pine," because of its fine shipping qualities, which causes it to rank high in a commercial point of view.

This plant fruits sooner than the sugar-loaf, and bears a greater degree of cold without injury, and also grows more thrifty on poor land, but the quality of its fruit is not so good.

The latter drawback, however, is not considered of much importance in its commercial value, and the Spanish to-day is the favorite pine-apple with the "large" Florida planter.

SUGAR-LOAF.

This is a superior fruit, fragrant and delicious in flavor, but inferior in size to the Spanish, and for this reason not so gener-

ally cultivated for market. The Egyptian Queen and the smooth-leaved Cayenne are fine varieties, the fruit of the former being considered superior to the sugar-loaf, while the large fruit and the smooth leaves of the Cayenne makes it a very desirable sort to cultivate; one of the drawbacks to the pine-apple culture being the torn clothes and flesh that are apt to follow quick or careless movements among its prickly leaves.

In the Azores, where, as in Florida, cold winds sometimes sweep over the islands, pine-apple culture is one of the great staples, and vast conservatories are built on purpose to preserve the fruiting plants from the uncertainties of the climate.

Fruiting plants, we repeat—for there is a distinction made between plants too small and those large enough to bear fruit—the former are left in the open ground to take their chances, as best they may, until they are nearly ready to fruit, then they are carefully taken up and placed in the conservatory, where the whole energies of the gardener are devoted to the task of coaxing out of it the largest and finest pine-apple possible.

This plant, as we have seen, does not fruit at any given time of year, but according to its size; and it is a point with Azorians to place their best fruit in the London market during the Christmas festivities and the height of the “season.” They have found a method of making their plants fruit at the proper time by constant attention to hurry their growth, or none at all, to retard it. Sometimes they even resort to the heroic treatment of sacrificing the bloom, so as to induce the immediate starting of the suckers that always appear, at the blooming season, ready to grow off rapidly, and bear fruit on their own account at a more suitable season than that essayed by their parents, whose career was, as we have seen, “nipped in the bud.”

Great care is taken in handling and packing the fruit, so that it may reach its market in full perfection. Choice specimens, frequently weighing twelve to fifteen pounds, are cut with the stem several inches below the fruit; then an ordinary flower-pot, or even a tin can, is filled with mould, and the stalk inserted in the latter in such manner that it looks as though it were grown there; each pine thus prepared is placed in a wooden skel-

eton case, just large enough to hold it, the pin being first wrapped in paper; in this way it can be transported without risk of injury. Extra choice fruit, such as we have described, is frequently sold in London for from twelve to fifteen dollars each, but usually the best prices obtained are from four to five dollars each.

The Florida grower has not the incentive of such extraordinary prices for his pines, but still there is profit enough, even in the American markets, to induce careful culture and packing; and, therefore, he would do well to follow the example of the Azorian grower.

Pine-apples, growing as they do on a tall stem, must naturally, as they grow large and heavy, incline to one side or other, and finally, if not prevented, will lie prostrate among the leaves or on the ground, exposed on the one side to rot from undue moisture; on the other, to sun scorch from the direct rays of the sun falling on it while moist with dew or rain. The pine-apple stalk should, therefore, be secured to a stake to keep the fruit upright.

In its wild state, when the ripe fruit falls over in this manner, the several crownlets and slips at the base of crown and fruit send down tendrils and take root; and then, thus established in life on their own account, they become detached from the parent fruit. It is by this method that large tracts of country become run over with pine-apples in a very short time; in the wild state, moreover, they ripen but once a year.

When pine-apples are nearly ripe, and unusually wet weather sets in, it is well, if possible, to shelter the fruit from excess of moisture, as the latter at this stage of growth is likely to cause blackness and acidity at the centre.

It has also been noticed that when the long leaves of the plant are drawn up around the pine, it colors better, and ripens more evenly.

CHAPTER XVIII.

GUAVAS AND BANANAS.

The guava is one of those fruits, which, introduced and acclimated in Florida some years back, is not yet fully appreciated at its proper commercial value.

Year by year, however, the guava is winning its way to the front rank of Florida fruits, and it only needs the establishment of guava jelly factories to give an immense impetus to the planting of this valuable fruit, the chief drawback to its extended culture thus far having been its perishable nature, its skin and general texture being much like that of a pear, only that it is more juicy, and in transit this juice is apt to be pressed out.

But no energetic person, as we shall presently see, need wait for the establishment of neighboring factories for making jelly of the fruit he raises, for it can be made at home, and the large profit therefrom accruing be placed directly in his own pocket: Or, if he is so circumstanced as not to be able to do this, there has lately been opened a way to ship his fruit to the jelly manufacturer without danger of loss in transit, and that is simply by drying it, just as any other fruit is dried. There are small family fruit evaporators now in the market that can be procured at a cost of only a few dollars, but as it is not every one who can afford even these few dollars, or who can conveniently procure the evaporators, even when the money to do so is forthcoming, we give below the plan of a home-made evaporator, which is equally effective, and can be made by any one of ordinary intelligence. This will be found useful, not only for guavas, but for all other fruits that one may wish to preserve by this method:

Three things are requisite—a hogshead; a long, narrow box, twenty inches deep and wide, and about six feet in length, such as is used for shipping tall nursery trees; and a small stove.

The hogshead is stood on end and a door sawed out of the side to admit the stove, a hole eighteen inches square is then made in the top of the hogshead to allow the heat from the stove to pass up into the box, which is stood upright over the hole, the lower end being knocked out, and is carefully fitted down on the hogshead, so that none of the ascending heat shall escape.

A hole, surrounded by tin, is made in the side of the hogshead opposite the stove, through which to pass the stove-pipe, so that none of the smoke can ascend into the box.

That which would be the lid of the box, if it were on the ground, is fitted on hinges, so as to open like a door, thus giving easy access to the interior, which is fitted with open sliding shelves, resting on cleats, about three inches apart, one above the other. These shelves should be of wood, with numerous small holes perforated in them; or, better still, of stout galvanized wire netting.

Place the fruit to be dried, cut in strips, on these shelves, close the door, which must fit as tightly as possible, keep up a gentle fire in the stove, and in ten or twelve hours you will have as sweet a dried fruit as you ever tasted, and the cheapest, too, by far.

Guavas preserved in this way can be preserved for home-use all through the non-bearing season, or shipped to jelly and marmalade factories without risk, and at a much less expense as regards freight, than if the ripe fruit were shipped in its natural state.

Guavas, if well cultivated and moderately fertilized, bear fruit in eighteen months from the seed; they are also easily sorted from layers or slips.

The guava is less a tree than a broad, straggling bush, although sometimes trimmed up into tree-shape, and in the more southern parts of Florida it grows so large that it becomes a veritable tree, with branches stout enough to support a person climbing among them.

Over considerably more than half the State, however, the "common guava" attains the height and shape of a large bush only, from twelve to fifteen feet high, because, unless carefully

protected, it is apt to be killed back by frosts, but even when this mishap does occur the roots are not injured. Very often the main branches are also unhurt, and the plant at once puts forth an amazing amount of energetic growth, and in a few months replaces all it has lost.

It is a common saying among growers that "if only one crop in three years is secured, it pays well to raise guavas;" but there is no reason why a crop should not be secured every year, the guava being naturally a constant and heavy bearer.

In setting out guavas, it is best to place them in rows, twelve feet apart each way; this gives them plenty of room, and yet is close enough to render it easy to protect them from frost, by driving down stakes here and there along the rows, as close as possible to the main body of the plants, on each side, and then nailing to these long, slender slats, in such a manner that the outlying branches will be pressed inwards in a compact mass. The stakes should be high enough to permit a covering of moss or pine boughs to be laid across the top, from side to side, supported by cross-slats here and there. This top cover is very important, as it is the heavy dew that falls on frosty nights that makes all the trouble. To prevent this cold dew from touching his tender plants is the one object of the Florida grower's winter protection.

Another method of cheating "Jack Frost" of his prey, is to have ready piles of wood, the bulk of it trash, that will make plenty of smoke to the north and west, since the hurtful winds always come from these directions. Then, when a frosty night is expected, the fires should be kindled and kept "smudged," so that they will burn slowly, yet sufficiently, until dawn. After the sun rises it is very rare indeed that any danger from frost remains.

If neither of these precautions can be taken, the next best way is to throw earth around their trunk, as high as possible, and let it remain thus until the end of January, and in unusually severe winters, even later; then, if the upper branches are "nipped," enough is saved for another vigorous starting point. But the guava, as we shall see, is well worth a great deal

more trouble and expense in affording it winter protection, than is required by any of the methods we have named.

One of the pioneers of Sumter county, whose experience with guavas dates back for many years, gives the following as his repeated experience of the actual profits received from making jelly of one's own fruit; he has done it, is doing it still, and has good reason to continue doing it:

One bushel guavas (regular price).....	\$ 2.00
Thirty pounds sugar ($12\frac{1}{2}$ cents per pound).....	3.75
Seven dozen jelly glasses.....	5.00
	<hr/>
Total.....	\$10.75

These seven dozen glasses of jelly, the product of one bushel of guavas, sell on the spot, to the merchants, who ship them North, at \$3.00 per dozen. This gives \$21.00 receipts. Deduct the expenses as given above, and for one bushel of fruit we have the handsome profit of \$10.25!

Now, when we consider that by planting guavas twelve feet apart, an acre will contain three hundred and two, and that after the third year each bush will average a full bushel, increasing as it grows older. If not allowed to suffer from frost the enormous and certain profits of the business may be seen at a glance.

Let us say that there are three hundred plants on an acre, each yielding but half a bushel (a very small crop), and that the profit per bushel is but \$10.00, even these reduced figures give \$1,500 as the profit of one acre for one season, to the man who manufactures his own jelly.

And these are not fanciful figures, either; but actual facts, to the truth of which people are at last waking up. There are more guavas being set out this year than ever before.

Those who do not care to make their fruit into jelly, can either dry it for shipping, as we have seen, or else sell it in neighboring towns, where there is always a demand for it, at \$2.00 a bushel, and even at the latter rate it is very easy to see how profitable a fruit the guava is.

Popularly there are supposed to be three distinct varieties of the common guava cultivated in Florida, all of them large, averaging five to six ounces, but some specimens reaching eight and nine, or more; rarely even ten ounces.

One of these varieties has a bright pink flesh, another yellow, and the third and favorite, white. The skin of all is green when unripe, yellow when matured, and all resemble pears in shape.

But these three apparent varieties are in reality the same; take the seeds of one sort, plant them, and the fruit will not come true only to the kind planted; some will have yellow flesh, some white, some pink; thus proving that the varieties are identical.

The guava scorns the longest drought, and responds generously to good culture and plenty of food. It needs no pruning, except an occasional pinching off of the end of a limb that has grown inordinately long without branching, and a cutting off or layering (for another plant) of such limbs as lie on the ground. The guava is a thrifty grower, not stopping to rest even during the cooler months, and this is why its young growth is so liable to be killed by frost.

Recently there have been introduced into Florida two varieties of guavas that are frost-proof, and hence are destined to be extensively planted as soon as known.

The fruit is similar in shape to the common guava, though much smaller, but the bush bears no resemblance at all to its commoner brethren.

The leaf of the latter is rather large, pea-green, lanceolate, and ribbed, the new growth being slightly tinged with pink.

The frost-proof guavas are more compact and slower in growth; their leaves are small, thick, shiny, and dark-green; more like those of a camelia or daphne than those of a guava.

One of these is the "Cattley guava," so named after Mr. Cattley, who was the first to introduce it into English hot-houses, from its native land, Brazil. The fruit, claret-colored, is not as large as an English walnut, but its lack of size is made up in quality and quantity, its flavor being far superior to that

of the ordinary guava, and making a more delicate jelly, while the bush is extremely prolific, an eighteen months old plant sometimes bearing nearly five hundred guavas.

The other frost-proof guava resembles the Cattley, except that the fruit is about twice as large, and is yellow. Both of these guavas have a decided strawberry flavor. The last mentioned is sometimes called the "strawberry guava," and the "yellow guava," but the true name is "guava of commerce."

These two varieties are scarce as yet, but this is a fault that will mend as time goes on. The grower who plants these need have no fear of frosts, and his yearly profits will be assured without the necessity of winter protection.

In selecting seed for planting guavas, and, indeed, any other fruit, sow only those from the best specimens to be obtained. This simple precaution will assure vigorous plants and superior fruit.

The guava, as a home fruit, is extremely valuable, taking the place of the peach in the north, to a great extent, and continuing to ripen from the middle or end of July until the beginning or middle of November, according to the season. The frost-proof guavas are not unfrequently found in bloom all the year round, and this is also the case with the common guava, in localities removed from the influence of cool weather. None of the guavas bear all their blooms at one time, and then are done for the year, as is the case with the peach, apple, and kindred fruits. The early spring bloom is, of course, that of the main crop, but ripe fruit and new scattering buds may be seen all through the season on the bush and stem.

The various modes of preparing this and other fruits for the table and commercial purposes will be fully treated of in our concluding chapter.

THE BANANA.

This favorite fruit is susceptible of cultivation only in a much more limited area than any of the other Florida fruits, for the reason that it, like the pine-apple, is a true child of the tropics, and cannot endure the least touch of frost uninjured; but unlike the pine-apple, it is not so readily sheltered, owing to

its tall stature. In the more southern portions of Florida, especially along the coasts, the raising of bananas for market has become quite an important industry, and even much further north in the State, where occasional frosts catch the plants and kill them to the roots. They are raised in no inconsiderable quantities, and when one remembers the amount of fruit they bear, in proportion to the ground they occupy and the care they receive, it is no wonder that they should be planted wherever there is the least chance of their perfecting their fruit.

One acre of bananas will produce as much actual food as forty acres of potatoes or two hundred acres of wheat; therefore, in eating one banana we obtain as much nutriment as if we had swallowed forty potatoes! Besides their food value, bananas are general favorites, simply as fruit, and we rarely meet with a person who is not fond of them; therefore, wherever they have any chance of reaching maturity. The Floridian sets out his banana plants, many or few, according to circumstances.

North of the twenty-ninth degree they are killed to the ground almost every winter; south of the twenty-seventh they are seldom touched by frost; while in the intermediate latitude they do well, rarely losing more than their leaves, and not always those.

The banana likes a rich, warm soil—sandy loam is the best; it does well on moderately moist land, but better on dry, if kept mulched.

In setting out a plantation of bananas, the young plants should be placed in rows eight feet apart, and nine feet apart in the rows, so set that each plant will be opposite the centre of the vacant space in the next row.

By pursuing this plan they will shelter each other, and yet will not ward off the rays of the sun, of which they cannot have too much; and moreover, a consideration not to be disputed, their broad leaves will furnish just the amount of shade required by garden vegetables during mid-summer, and the fertilizers and cultivation applied to the latter will also benefit the bananas.

In preparing for the plants, holes three feet wide and two feet deep should be dug, and a rich compost of rotted leaves,

muck and manure, or commercial fertilizers, placed in the bottom of the hole, and the rest mixed with the soil that is packed around the roots.

A mistake our Florida planters usually make is, in not setting the banana deep enough in the ground. The hole, as we have said, should be two feet deep, and if the plant to be set should not be large enough to permit this depth to be filled in around it at once, then the earth should be packed in as far as possible, and the rest filled in gradually, as the banana grows upward. In other words, the banana plant, to do its best, must be set at least two feet below the surface of the ground. When fifteen months old, the banana, if it has no drawbacks, will put forth, from the center of the stem, at the top, a curious-shaped bloom, that just appears, pointing upwards from amidst the broad leaves, and then droops outward and downward at the end of a stout stalk. The bloom looks much like a fat ear of corn with red husks. These latter lift slowly up, one after the other, as though hinged at the top, revealing the strange, odd-looking "fingers" of bananas, ranged symmetrically beneath them. Each leaf of the husk drops off after it has done its duty in protecting the young fruit from the sun for a day or two, and then the next in order of descent raises the lid from its row of fruit.

The same red husks, brighter inside than out, are just the shape of the popular, long, shell-shaped pickle dishes, and retain their stiffness for days, and holding a cup full of water, they make really beautiful bouquet-holders, that the eye cannot tell from the finest Japanese red lacquer ware.

The number of fingers in a cluster of bananas varies greatly, according to the variety of the plant and richness of the soil.

The Horse, or Orinsca banana, which is most commonly cultivated in Florida, bears from twenty to sixty bananas, in fingers or rows of eight to ten. They are usually large, and when suffered to remain on the plant till nearly ripe, are as fine in flavor as one need wish, but when cut green, are apt to be insipid.

Another banana, Hart's Choice, or the Golden Early, is superior to the Horse banana in every respect. Both of these varieties will stand a greater degree of cold than any others of

their race, and the fruit of each is yellow when ripe, but these are the only main points of resemblance.

Hart's Choice, or Golden Early, a native of the Bahamas, is stout of stem, and does not break down beneath the weight of its fruit in a gale, as the Horse banana frequently does. It blossoms early, and in warm weather the fruit may be cut in ninety days thereafter. The other variety is often from one hundred to one hundred and twenty days in ripening. Hart's Choice bears from fifty to one hundred bananas in a cluster. The fruit is four inches long and one and a half in diameter, with a clear, golden-yellow skin, slim as a kid glove; the flesh is firm, yet melting and buttery, sweet and highly aromatic, but not musky, like so many of the banana tribe.

There is no finer banana than this in the world, and Florida owes a debt of gratitude to Mr. C. H. Hart, of Federal Point, whose twelve years' patient efforts and experiments led at last to the discovery of the "Hart's Choice" banana, or as some of our nurserymen have chose to call it, "Golden Early."

Sooner or later, for it varies greatly as to time, the banana plant will send up suckers from its roots, which in due time are to take its place; for the banana, like the pine-apple, bears fruit but once, and then, if not cut down when the latter is removed, it will soon fall prone on the ground. The best plan is to chop it up (an easy matter) in small pieces, and bury them near the growing plant, as the decaying leaves and stems of a banana plantation furnish it with no small amount of fertilizing material.

The banana will often send up from five to ten suckers, and these should not all be allowed to remain; if they are, the result will be small, stunted plants and fruit. Two are enough to leave with the parent plant; the others should be transplanted when about three feet high.

It is a fact not generally known or noted that from transplanted suckers no great results in fruit will be obtained. The planter must look for the heaviest fruiting to those stalks that have come up from the parent root and have never been disturbed. Heavy mulching during the summer months will be found of great utility.

CHAPTER XIX.

GRAPES.

Many varieties of grapes have been tested, and tested satisfactorily, in Florida, but foremost among them all ranks the *Bullace*, or *Vitis vulpina* family, native grapes of Southern origin, which, owing to their late blooming and late ripening, will not succeed north of the more southern portions of Virginia.

It is a curious fact that while the several members of this family vary greatly in the quality of their fruit, even in the wild state, this is the only difference that can be detected in them: All the cultivated, and all the wild varieties, are alike in leaf, bloom, and general habits, the only perceptible difference, apart from the fruit, being that the white sorts have pale green tendrils, and the purple kinds, purple tendrils.

The whole habit and manner of growth of the *Vitis vulpina* family is so entirely unlike that of any other grape in cultivation, that the rules generally applied to grape culture are here at fault.

Most grapes root with ease from cuttings, but the Bullace varieties do not, their wood being so dense and compact that it is almost impossible to get cuttings to strike; consequently, the vines are propagated by layers, and where a large number are desired, certain vines are set apart for this purpose alone. These are kept cut back almost to the stump, only short shoots, with four or five eyes on buds, are left. This is done in the fall; in the spring these shoots, which are very numerous, and allowed to grow until June, by which time they will have attained a length of five or six feet; then the leaves are all stripped off from the lower part, and the shoots gathered up in bunches of six or eight; a hole is made near their junction with the stump; a handful or two of rich compost, or thoroughly rotten stable manure incorporated in the soil to be filled in, then the vines are

bent down into the hole, the earth firmly packed in on them, the ends left out turned slightly upward, and the work is done. During the summer the weeds must be kept down, and the ground kept slightly moist, not wet. By November the layers are ready to be lifted and set out, either in their nursery or in their permanent places ; they will be found fully supplied with strong, thrifty roots. One good, large stump, thus devoted to propagation, will in one season furnish from fifty to a hundred layers.

These layers may be set out at any time while dormant, and this, of course, is during the winter and early spring months.

They should not be set closer than twenty-five feet to each other in any direction, and if the land is very rich, not closer than thirty feet. This may seem very far apart while the vines are young, but wait awhile, and see ; and if the holes where they are planted are well manured before setting out, you will "see" all the sooner.

Cut back the vines as they are planted, so that not more than three or four eyes or buds are left, and drive down a stout stake alongside of each, so that it stands fully six feet out of the ground.

Watch the young vines carefully, and pinch off all of the lateral shoots, a few at a time, so as not to check the growth of the main stem, which is the object of your care. This must be tied to the stake as it grows, until, at the end of its first season, it should have reached the top, a single, stout, clean stem.

Before spring comes again, a canopy should be prepared ; four perpendicular posts, six feet high (out of the ground) and ten or twelve feet apart, with slatted top, will suffice for the second season's growth, and each season, as the vine spreads, the canopy must be spread also to meet its increasing requirements.

It is a fact to be noted and heeded, especially by the Northern settler, who thinks he "knows all about grapes," that the Bullace family will not do well at all, spread out on the perpendicular arbors usual at the North, and indeed everywhere, for most other varieties of grapes.

They must emphatically be kept spread out uniformly on this horizontal canopy, and not permitted to overleap and crowd ;

if they are, the fruit production is lessened and deteriorated ; also the trunk, for six feet up, must be relentlessly shorn of all lateral branches.

It has often been said that the Bullace grapes do not need pruning ; and this is quite true, in the sense in which most other grapes need it. This difference is owing to the fact that in the *Bullace*, or *Vitis vulpina* family, all the eyes or buds, that in other vines lie dormant, unless forced into activity by pruning, start out of themselves, thus causing a more even, uniform growth over the whole vine ; sometimes, when the vine is very vigorous, the branches overleap and crowd, and in these cases the Bullace vines need pruning, to the extent of setting out the feebler stems that are crowding. We have often heard, and known, of persons "bleeding to death," but it is not often that this happens to a denizen of the vegetable world.

Until very recently, all nurserymen and growers held that there was no remedy for preventing Bullace grape vines from literally bleeding to death if any considerable limbs were cut or broken during those months when the sap is flowing freely in the spring and summer. Such is the tremendous force of the circulation of the sap, that the wound thus made has no time to heal over, like that of an ordinary plant, but flows out, drop by drop, until the vine dies for want of nutriment. Recently, however, one of those happy accidents by which so many discoveries are made, revealed a remedy, certain, and easy of application.

A strong, thrifty vine having been burned by its frame catching fire, the owner cut it back to about eighteen inches from the ground. The vine at once began to bleed, and its death must have speedily followed had he not bethought him of charring the cut end ; a lighted torch was applied, but for a day afterwards the sap continued to drip, though slowly ; another charring, the cure was complete, and the vine saved. The vine, if it has grown with its usual vigor and thrift, should bear the second year from the layer—that is, the first season on the canopy ; of course it does not bear very heavily ; it has as yet neither root nor branch enough to make much of a crop, but with each year's growth the yield increases rapidly.

Old vines frequently bear thirty bushels of grapes, and in vineyards of fifteen to twenty years' standing, single vines often yield from fifty to seventy-five bushels.

A bushel of grapes, weighing about sixty pounds, yields three to four gallons of wine, and from the pomace that remains after expressing the juice, no inconsiderable amount of vinegar can be made.

The following are the several varieties of the *Bullace*, or *Vitis vulpina* grapes :

SCUPPERNONG.

Bunches seldom composed of more than eight or ten grapes ; grapes large, round, bronze color when fully ripe ; skin, thick flesh, pulpy ; very vinous, sweet, and of a peculiar musky aroma ; exceedingly pleasant and refreshing. Matures from middle to end of August. Fruit has never been known to decay before maturity. Vine is free from attacks of insects or disease ; gives a certain crop annually ; is very prolific, and rapidly becoming popular as a wine grape. Makes an excellent sweet wine, resembling Muscat, and when properly manipulated, produces a fine, sparkling wine.

THOMAS.

Bunches of six to eight grapes ; grapes oblong, large, light violet color, quite transparent ; pulp tender, sweet, of a peculiar vinous flavor ; quality superior to any of its type ; has but little musky aroma, and makes a superior red wine. Matures middle to end of August.

FLOWERS.

Bunches of from fifteen to twenty-five grapes, which are almost black, and sweet vinous flavor. Matures end of September to middle of October.

TENDER PULP.

An improved seedling of the Flowers. Grapes large, very sweet ; pulp tender. Matures end of September.

PEEDEE.

Resembling the above, except that the grapes are light colored, like the Scuppernong.

There are doubtless many other varieties of grapes that will do well in Florida, but as yet comparatively few have been tested, and there is still a wide and profitable field open for experiment.

CONCORD.

Bunches large; berries very large; blue-black, with bloom; skin thin; pulp juicy; a beautiful market variety; rampant grower, and good bearer. Ripens middle of July.

DELAWARE.

Bunches medium, red or pink; skin very thin; pulp very slight; juicy, vinous, and most delicate table grape; very prolific bearer. Ripens about middle of July.

CLINTON.

Bunches medium; berries large, black, vinous, and very refreshing; makes a delicious claret wine. Ripens middle of July.

DIANA.

Bunches large, compact; berries large; reddish lilac; little pulp, sweet; very productive.

HARTFORD PROLIFIC

Bunches large; berries large, blue; flesh pulpy, musky, sweet; prolific bearer, and fine grower. Ripens early in June.

GOETHE (ROGERS' NO. 1).

Large, greenish yellow, turning pink at full maturity; very sweet, vinous, and of well-defined aroma; excellent, and is a reliable bearer. Ripens in August.

WILDER (ROGERS' NO. 4).

Very large, blue black; very fine, and a thoroughly reliable bearer. Ripens in August.

MRS. M'CLURE.

A cross between Peter Wylie and Clinton; foliage and growth resembling the Clinton; very vigorous; bunch and berry medium size; white, and of excellent quality.

PETER WYLIE.

Vine vigorous, short-pointed; holds its foliage till fall; bunches alone medium, shouldered, loose; berries medium. round, white, transparent; golden yellow at maturity; flesh melting, vinous, delicate, Muscat flavor; quality best; best flavored white grape ever grown in the South. Ripens in July,

BERCKMAN'S.

Holds foliage till frost; bunches large; berries above medium; reddish pink; first quality. Ripens in July.

These are all native grapes of the foreign varieties. Black Hamburg, Black Prince, and Chasselas Blanc, or White Sweet Water, have been tried, and "not found wanting."

In fact, there is no doubt that Florida is destined to be a great grape country, both for raisin-making and for the production of wine. The grape loves a warm, dry, sunny soil, more especially a sandy loam, and this Florida can give almost over her whole surface.

Here, as well as elsewhere, one of the greatest difficulties the grape-grower has to contend with is the pilfering of the numerous birds.

Covering the several bunches with paper, or cheese-cloth bags, is a method often resorted to for protection; but this is a very tedious process. Another is to pass strings across the tops of the vines; birds will not alight under them.

Still another, and a very effectual way to save the grapes from the feathered robbers, is so to train the vines on horizontal canopies that the dense mass of foliage on top will shield the fruit below; the birds then cannot reach it, for they will never fly up from beneath the canopy.

Yet another, and very effective method for protecting, not

only grapes, but all fruit, is one invented by a poor East India native, who little expected its fame would ever travel beyond the limits of his humble field.

An empty bottle, a string, a cork, and a nail—these are the materials required.

The bottom of the bottle is cut off by a heated wire being drawn along a file mark ; then the string is passed through the cork in the mouth of the bottle, its lower end, with a nail (or small stone) tied to it, hanging about two-thirds of the way down to the lower part of the bottle ; this, you will see, at once converts the latter into a bell, the nail being the clapper ; the bottle must now be hung up on a twig of the plant to be protected, either by a continuation of the clapper string, or, which is much better, by a wire passed around the neck of the bottle. The least breeze causes this novel bell to tinkle, and a number of them, placed here and there, in an orchard or vineyard, will effectually frighten away the birds, and preserve the fruit from their ravages.

In picking grapes to send to market, great care must be taken not to handle the bunch itself, as this will rub off the bloom, which lends so attractive an appearance to the grapes ; the stem only should be held in the hand.

Five-pound boxes, not larger than these, are the proper size for packing them in ; they are very cheap, and are made either of very thin pieces of wood, or of stiff pasteboard. The grapes must be laid in carefully, shaken lightly to make them pack firmly, and filled even with the top.

The boxes thus prepared are placed in larger boxes, and are then ready for shipment.

When grapes are properly handled in picking, so that they are not broken or bruised, they may be kept for months by the following simple process :

Nail cleats on the inside of nice, clean boxes, about an inch from the top, and between them, on the inside of the top of the box ; nail bars, made of two strips of wood, placed one on the other, the lower one the widest, so that there will be a ledge on each side of the narrower centre strip.

Let the grapes hang on the vine as late as possible, and then cut the bearing shoot, so that the bunch of grapes will lie in the centre ; cut the shoot to fit, so that it will slide in by a tight fit on the bars, one end resting on a ledge of each ; this will hang the bunches in their natural position, allowing the air to circulate freely all around them.

Put the cover on the box (loose), and place the latter in as cool a place as you can find ; remove the cover now and then, and examine the bunches, taking off any dried or decaying berries.

CHAPTER XX.

CHINESE SAND PEARS.

All over the North, wherever pears are grown, there has of late years prevailed a dire disease, mysterious in its cause, mysterious as to its remedies, and plain and certain only in one respect, that of the destruction of pear-growing as a profitable market fruit. Whole orchards of thousands and tens of thousands of trees have gone down before the dread disease, and their owners have abandoned the pear-growing business in despair.

For years it seemed as if this delicious fruit must be numbered among the things of the past, but for the advent of that for which our horticulturists had been largely hoping, an entire new race of pears, with all the health and vigor of the wonderful pears of China, and free from the dreaded "blight" and all other diseases so destructive to those which may now be termed our native varieties.

In China the pear trees reckon their lives by as many centuries, as ours by decades, and are never attacked by disease.

This sturdy race of pears has been acclimated in the United States by half a century of trial, and in all that time not a single Chinese pear has been touched by blight, or any other disease.

Happily it has also been shown that these pears, unlike the majority of the more familiar sorts, have been proved to be especially adapted to the Southern States, particularly to Georgia and Florida.

As yet there are not many varieties of these pears, all of the sand pears now on the market having sprung from the original Le Conte, but this is a fault that will soon be mended, for all over the land enterprising horticulturists are experimenting in hybridizing the China sand pears with our old valued varieties; that is, taking the pollen from the blossoms of our best

dessert pears and impregnating with it the blossoms of the healthy, hardy Eastern sorts.

Trees grown from the seeds of pears thus impregnated have retained the same degree of health and vigor and freedom from disease that belonged to the mother tree, while the fruit they bear is as large, handsome and delicious as that of the home variety, which was selected to be the male parent, which is usually the Bartlett.

And of such excellent keeping qualities are these newly created pears that they may be, and have been, shipped to Europe as freely and successfully as apples.

This race of blight-proof pears is one of remarkably rapid growth and intense thrift and vigor. The trees grow readily from cuttings, and if well cared for, will bear in three years from the date of rooting.

Their value is greatly enhanced by their power of adaptation to circumstances, for they will thrive on sandy soil, or in clay, in dry lands, or in moister situations; although they should never be planted in places more than moist—wet. They like a rich soil, and respond generously to liberal feeding. As all pear trees need a good supply of water when fruiting, they should be heavily mulched during this period, if set out on lands subject to drought.

All the sand pears are naturally symmetrical in shape, and very ornamental, needing little pruning, save the removal of dead branches from time to time.

That the Chinese race of pears is destined to become one of the staple productions of Florida, as it is already of Georgia, we have no doubt. It has only been three or four years since this fruit first began to attract the attention of Florida fruit growers, and already groves of five to twenty acre orchards of Le Conte pears are being planted here and there over the State by far-seeing men, whose energy (and means) are equal to their faith.

From all parts of Florida reports are beginning to come in of the successful fruiting of the few trial trees set out, and before long pear orchards will be no uncommon sight. In some localities they will rival the orange in number and importance.

At present the Le Conte is the one Chinese sand pear most generally known, because it was the first to be introduced, and from it the other varieties have originated—some from the seed; some just as the Le Conte itself originated, from an accidental hybridizing with the Bartlett pear—and of course some years necessarily elapsed before these new sorts could be fruited, or be sufficiently proven, to be placed upon the market as distinct varieties. Meantime the Le Conte was winning its way to the front rank and becoming widely known. There are now other pears, however, originating from it, as the mother tree, that are destined to surpass it in public favor as soon as their great merits are generally known. Among these the Kieffer Hybrid, as we shall presently see, stands pre-eminent.

The history of these several varieties of the Chinese sand pears is as follows :

THE LE CONTE.

Over forty years ago, Major John Le Conte purchased a lot of fruit trees from a New York nurseryman, and among them was one labelled "Chinese Sand Pear." He was told that this tree was of no value, as the fruit would not mature in this country. The Major, however, carried it to Liberty county, Georgia, where it "waxed exceeding strong," grew into a tall, beautiful tree, and soon began to bear a large, fine fruit, excellent for cooking, for preserving, and for dessert.

Major Le Conte had presented this tree to Mrs. Harden, and after its true nature had been thus revealed, a friend of the latter, Major Varnadoe, secured a cutting, and started the second "Le Conte" pear tree in Georgia, but just then came our terrible civil war, and the tree was neglected. Peace restored, the Major turned back to his old project again, of propagating this grand tree on a large scale, and when he moved to Thomas county, Georgia, in 1869, he carried with him a great quantity of these cuttings, and from the young trees that resulted from these was inaugurated what has already proved to be in Georgia, and will soon prove to be in Florida, a veritable "bonanza."

The oldest growers of the Chinese sand pear race have yet to meet with a single case of blight, or other disease, or defective fruit.

The Le Conte pear roots with extreme ease, if kept slightly moist while rooting, and grows off afterwards with great rapidity, frequently attaining a height of thirty feet in seven years, with limbs twenty feet long, bending to the ground under their weight of delicious fruit, until such a tree, fully fruited, resembles a weeping willow, so far as its branches are concerned. The general shape of the tree is that of a cone, and is very handsome.

It is of unexampled prolificacy, it being no uncommon thing for a tree to bear from four to six bushels of fruit at its first bearing, and at its fourth year, to yield twenty bushels of fine, marketable pears.

They ripen about the first to the middle of July, more than a month before the earliest of all other pears, and hence always "skim the cream" of the markets. Major Varnadoe, a year or two ago, received \$10 a bushel for his first shipment; the usual net price, however, is from \$5.00 to \$6.00 a bushel.

It is a peculiar feature of this pear that it perfects not only one crop in one season, but sometimes partially matures a second before the first is all marketed.

The pears are picked before they are fully ripe, and then they are spread out on one blanket and covered by another. This ripens them evenly, and gives a rich golden color, which makes them as pleasing to the eye as they are to the palate, for the Le Conte, be it known, is a fine flavored, juicy, aromatic fruit.

The tree has no "off years," but gives continual crops year after year. The original tree, in Liberty county, Georgia, is the greatest bearing pear tree known; has never missed a crop, and has yielded at one picking thirty-nine bushels of large, smooth, marketable pears.

Another thing that extremely enhances the value of this remarkable fruit, in a commercial sense, is its unusual keeping qualities. The Le Conte is one of the best, if not the very best, shipping pear that the world has ever produced, excepting only its own offspring, as we are about to note:

KIEFFER'S HYBRID.

In the year 1868, Peter Kieffer, of Philadelphia, planted a quantity of seeds of a Chinese sand pear in his garden. One of the seedlings thus raised proved to be the bearer of a new variety of pear, and one of exceeding merit in every respect. This seedling commenced bearing in the year 1873, five years from germination of the seed, and has borne full crops every year since, the quantity steadily increasing with the bearing surface of the tree. In the fall of 1877 it yielded four bushels, the next eight, and so up to the present season the yield has gone on steadily increasing.

Wherever the Kieffer Hybrid has been exhibited it has taken the first prize as the best blight-proof hybrid seedling, and in the markets it always commands a higher price than any others. The fruit is large, measuring from ten to twelve inches around; is double turbinate in shape, pointed at both ends; flesh white, and remarkably firm, until it ripens; then it is juicy, rich, with a pleasant vinous flavor, and of best quality.

It is a splendid keeper, and can be shipped to markets a month or so distant, arriving in better order than when it started, ripening on the way. It does not rot until very ripe, and remains sound at the core to the very last. The fruit is a rich yellow, tinged with red, and very attractive. The tree is very ornamental, an early bearer, commencing to fruit at two or three years, and is enormously productive as it grows older. It is also a very strong grower, young trees planted in the spring often making a growth during the summer of four to five feet. It grows well in any ordinary soil, whether heavy clay or light sand, but does its best on the latter, hence is peculiarly adapted to Florida. The fruit commences to ripen in July and continues through November.

At the International Exhibition, in Philadelphia, in 1876, the Centennial Commission gave to P. Kieffer a prize medal and certificate of award, for "originating a hybrid pear of remarkable excellence, between the pear of culture and a Chinese sand pear, giving promise of a new race of pears of great excellence.

GARBER'S HYBRID.

This is the best of many seedlings of the Chinese sand pear, raised by Mr. J. B. Garber, of Pennsylvania. The tree is fine healthy and vigorous, like all that spring from this hardy source. The fruit is of good size, measuring nine inches around, and is much flatter and rounder than the Le Conte, or Kieffer. Its color is greenish-yellow when ripe, with a red blush on one side; stem is slender, of medium length; flesh firm, coarse-grained, juicy, with a peculiar, pleasant flavor. It ripens well and evenly, and is of excellent quality and a good shipper. Ripens in September.

COCKLIN'S SHA-LEA.

This pear is the best of two thousand Chinese sand pear seedlings, raised by E. H. Cocklin, of Pennsylvania, and is not a "sport," but, undoubtedly, an accidental hybrid between the above pear and a Bartlett tree, which grew near that from which the seeds were obtained.

The seedling commenced to fruit in 1873, when five years old, and has borne full crops every year since, bearing in 1877 eight bushels of fine, marketable pears.

The fruit is remarkably handsome, smooth, high-colored and beautiful. The skin is yellow, with a bright-red blush on one side; medium size, measuring ten inches around and twelve inches lengthwise; stem, long; calyx, small; shape, double-turbinate; flesh, white, crisp, firm, and of good quality.

This pear, from its handsome shape, fine color, and other good qualities, has already become a prime favorite in the market, selling readily at \$6.00 per bushel, when pears of the older varieties are selling at one-third that price. The fruit begins to ripen in October and continues through November, just when pears are scarce and high.

These three new-comers in the family of Chinese sand pears, Kieffer's Hybrid, Garber's Hybrid, and Cocklin's Sha-Lea, are destined to secure as fine a foothold in our Southern pear orchards as their mother tree, the original China Sand, or Le Conte pear, has already done. Very few pears grown on any

of these trees prove to be unfit for market, but any that should be so, could be readily utilized by drying them, just as we have recommended the surplus guavas to be treated.

In handling pears for market it must be borne in mind that they are a delicate fruit, and require tender treatment, a bruise being ruin. They should be picked when fully matured, but before they are ripe, to insure safe carriage. To hasten the ripening process, they should be spread on paper or blankets and covered with the same, in a moist air. To retard the ripening, keep the fruit uncovered, in a dry air, and as near 40° temperature as possible. In packing, remember that pears absorb odors with great readiness, and, therefore, always pack them in clean barrels or boxes. Never use "fruit-baskets;" they are not firm enough. Either pack in slat-boxes or in barrels, with plenty of holes bored in them for ventilation.

Pears are not elastic, like apples; therefore must not be packed down so tightly. When the point of destination is very distant, the sides, top and bottom of box or barrel, should be lined with paper, straw, or some other soft, dry material.

Separate the different sizes and qualities, just as with oranges or lemons, and place them always on their blossom ends. Pack just tight enough to keep the fruit from moving about. The French gardeners are justly celebrated for their success in packing pears for distant markets, and this is how they do it: They pack their pears, carefully picked and handled, in small boxes, covering the sides and bottom with dry moss, or soft, dry paper, as we do oranges; and pack in layers, the largest and primest specimens at the bottom, and fill in the interstices with dry moss or paper. In this way, every pear is held firm in its place, and no one pear can press another.

CHAPTER XXI.

FIGS.

This fruit is destined to become one of the staples of Florida. It is of quick and easy growth, and particularly adapted to both soil and climate; but up to the present time its culture has been carelessly conducted, and but little pains have been taken by the nurserymen of the State to introduce those varieties especially suited for commercial purposes—namely, those that are light-colored, and, therefore, the best when dried for market, and those that are superior as table fruit.

It is with the fig, in its natural state, much as it is with guavas, the taste for each must be acquired, but when once attained, is very strong.

In Europe, the people are trained from childhood to like the fresh fig; it is seen on the hotel tables as a dessert fruit, whenever it is in season, and fresh or stewed, even more than dried, it forms an important part of the food of the masses.

It is a mild laxative, and hence particularly healthy for a warm climate, and to this fact the inhabitants of Southern Europe are fully alive.

It should be the same in America, and would be, if more care were taken to place the best sorts on the market.

Wherever fresh figs are offered for sale in the United States, the largest and coarsest kinds only are sought for, and it is very amusing to those who know better, to see a customer pass scornfully by a lot of fine, delicate flavored, but small fruit, and purchase a larger, more showy kind, not one-half so palatable or rich.

The people are not yet educated up to a proper appreciation of figs, and it is the fault of the producers that this is the case. The public are always ready to seize upon a good article, when it is made known to them as such.

So long as the fruit growers exercise so little care and wis-

dom as to plant inferior sorts of figs, because they are larger than the more delicate kinds, just so long will the people care little for them in their fresh state, not knowing how excellent a fruit they might have.

Let the fruit growers of Florida and California set out the small, finely flavored varieties of figs, and there will soon be a demand throughout the country for all that they can raise.

It is true, as urged by the former, that the coarser kinds, such as the Brown Turkey, Mission, and Brunswick, are hardier and easier to raise than the others; but there are many localities in both the great fig-growing States, Florida and California—in fact, through all the length and breadth of the former—where the finer and more delicate sorts could be raised, without the least danger of loss by frost.

Let our growers try it, and they will soon find that the fig is one of the most profitable fruits that can be placed on the general markets, either fresh, preserved, or dried.

Already, here and there, in Florida, a few wide-awake, enterprising men are establishing factories, where limes, figs, oranges, citron, guavas, and any other fruits that can be obtained, are being prepared for market in the shape of pickles, preserves, dried fruits, jellies, marmalades, and wines. The only trouble is that they cannot procure enough material to keep them busy, except in the one item of oranges, the others not yet being raised in sufficiently large quantities.

For instance, this past year, at St. Augustine, Mr. S. B. Valls, during the height of the fig season, preserved about sixty bushels of that fruit daily, but the supply was soon exhausted, and in the quaint old city the people complained, because there were no fresh figs left for them to purchase for home use; thousands of bushels more could have been sold in this one place alone, with great profit to the growers. It was the same with limes and with guavas—the factories were compelled to close for want of material to operate on—and yet there are thousands of acres of land suitable for the culture of these valuable fruits still unoccupied.

The fig-tree grows very readily from cuttings, and this is

the most satisfactory way to start a fig orchard—planting the cuttings deep, just where they are to stay, for the fig is much like the pine-apple with regard to its roots; the latter object so strongly to transplanting, that they are very likely to die, or, at least, lie dormant for months, or even years, while new roots are forming alongside of them, and outstripping them in the race.

We heard not long since of a gentleman who set out several fine young fig-trees, procured from a nursery; the trees did not die; they lived, but that was all they did do for more than three years, and so disgusted was their owner, that he was on the point of digging them up, and throwing them away, when, happening to relate his experience to a wiser neighbor, the latter bade him let them be as they were.

“I have often remarked,” said he, “that almost invariably a fig-tree transplanted will lie comparatively dormant for four years, and then start out, grow rapidly, and bear prolifically for years upon years. Wait a few months longer; your four years are nearly up, and then you will see.”

So the fig-owner waited, and he did see. The condemned trees suddenly awoke to life, and put on a vigorous growth. In one season they gained as much bearing surface as could reasonably have been expected in three seasons, and the following year, and every year thereafter, these awakened trees bore heavy crops of fruit.

A cutting, placed in permanent position, with the ground properly prepared and suitable, after treatment given, will outstrip any transplanted fig-tree.

Wherever the future tree is to stand—and if there is clay near the surface, so much the better—a hole three feet in diameter, and two feet deep should be excavated, the top soil thrown to one side, the sub-soil to another; then a compost of muck, forest leaves, and stable or hen manure, or some commercial fertilizer, should be thoroughly incorporated with the top soil, and the hole filled in, and tightly packed with this mixture.

If the compost is moist, as it should be, the fig-cutting may be thrust down, sloping in the centre of the spot thus prepared, the earth packed firmly around it (in this last lies the secret of

successful rooting), a mulch of leaves or grass placed around it, a tall stick or two driven down alongside as a guard, and the work is done. There should be a long dry spell after planting; then, but not otherwise, the cuttings should be watered.

Before long buds will develop, and the young tree will grow right along, beginning to bear in its second or third year, and continuing to do so for a lifetime or more.

The time is not far distant when our people will awake to the true value of the fig, whether sliced, with sugar and cream, as a table fruit, as a preserve, as a sweet pickle, or as a dried or shipping fruit.

Wherever fresh figs are placed on sale in the Florida cities and towns, they sell readily at from ten to twenty cents a quart, and even if the local price should fall to five cents a quart, there would be still a handsome profit for the grower.

The experiment of shipping fresh figs from Florida to the Northern markets has already been made, with eminent success. They were sent in refrigerator cars, carefully packed in quart boxes, and having been picked just before maturity, they ripened in transit, and arrived in perfect order, bringing the splendid price of forty cents a quart, when, even at one-fourth of that amount, they would have given a very large profit.

There is no doubt whatever, that if good, sweet, ripe figs are thus sent to the Northern cities in quantities, they will soon be sought after as a dessert fruit; they only need to be known to become exceedingly popular, just as they are in Europe.

The true Smyrna fig, the dried fig of commerce, has not yet been introduced into Florida, although it has been acclimated for some years in California, where it is destined to become a most valuable article of commerce in its dried state, both for consumption in the United States, and for export to Europe. The principal varieties of the fig now cultivated in Florida are as follows:

ANGELIQUE, OR EARLY LEMON.

Small, greenish yellow; fine flavored; early.

BRUNSWICK, OR MADONNA.

Very large; violet; good, and very productive.

BLACK ISCHIA.

Medium size ; blueish-black ; very good quality.

BLUE GENOA.

Medium size ; blueish-black ; very fair quality.

CELESTIAL.

Very reliable for orchard culture ; class fruit, very early, and gives large crops ; fruit, medium size, pale violet, and very sweet.

BROWN TURKEY.

This variety is also excellent for orchards ; fruit, medium size, brown, very sweet, and delicious.

GREEN ISCHIA.

Fruit, medium size ; green, with crimson juice ; very good and prolific.

LEMON.

Very large ; yellow, sweet and prolific.

CHAPTER XXII.

PEACHES—PLUMS.

Heretofore, Florida, partly because it is a newly settled country, has not done much in the way of peach-raising; but the few who have had enterprise enough to plant and cultivate a few trees have been amply repaid, and the result of such intelligent efforts is sufficient to justify the assertion that when Floridians wake up to the fact that "there's millions in it," then their State will easily step forward into the first ranks as a peach grower, for the peach is a native of a mild climate; severe winters chill its life-blood, and late springs kill its delicate blossoms or young fruit. Florida's mild winters are congenial to it, and if we exercise proper care in the selection of varieties, we need have little, if any, fear of our crops being "nipped in the bud" by Jack Frost.

The peach, to do well, requires care and cultivation, but given these it will accommodate itself to almost any soil, and while preferring a clayey loam, will flourish in the sand if the clay be three or four feet below it.

Of course, with peaches, as with other fruits, not all varieties are suited to all localities. For each section of country there are certain kinds that do well, while others will not grow at all; and all succeed better in the more northern parts of the State than in the extreme southern portions.

The trouble in the latter localities lies in the tendency of the tree to rest in its growth during the latter part of summer, and then to start again in the fall, and come into bloom just when they should be taking their winter's nap. This late bloom rarely sets, and if it does, the fruit is caught by the cold weather, and nipped in its early infancy.

Fortunately, however, when this late bloom does come, it is usually scattering, and does not materially affect the proper

spring blooming ; sometimes, though, the trees in fall are covered with their beautiful blossoms, and then, alas ! for the peach crop that year.

But, by proper management, this mishap may be averted. There is no tree that responds to constant cultivation as does the peach ; so long as the earth is kept clean and well stirred around its roots, just so long will it keep on growing.

Now, the Florida spring, or growing season, begins in January, or at the latest in February, and then the peach, with other trees, commences its new growth, with a longer season before it, than its family are accustomed to ; hence, by the time it has grown its wonted number of months, it is only mid-summer in Florida and not fall, as the same number would bring it from the Northern spring.

Hence, at this time, the peach-tree has a natural tendency to rest, and will do so, to start again just when it ought to begin its dormant state, unless its owner is particular to keep its roots active by constant stirring of the soil, and so to keep it growing steadily until the middle or end of October.

By pursuing this course, the Florida peach will bloom at the proper time, and produce a crop that will enormously remunerate the grower.

From seventy-five cents to one dollar and a half each, is no uncommon price for Florida peaches to bring in the Northern markets in the months of May and June.

Northern grown trees, brought to Florida, very rarely pay for the ground they occupy, and it is the same with Northern varieties.

It is not every peach that will succeed so far south. Of those that have been tested, and proved to do well, we name the following :

PEEN-TO, OR CHINESE FLAT.

This is not only a very fine peach, but a most remarkable one in appearance. The tree is of strong, thrifty growth, a prolific bearer, and blooms in January or early in February, according as the season is early or late, and the fruit matures early in May. The latter is odd in shape, being two to two-and-a-half

inches in diameter, and so flat that the stone is barely covered by the skin at the stem and blossom ends: the flesh is very finely grained, juicy, with a delicate almond aroma; is a "cling;" the skin is a pale, greenish white, with a beautiful mottled red cheek, and peels readily when ripe. This is the peach of all peaches for Florida; and next in rank comes the

HONEY.

The tree is a very strong grower and prolific bearer; fruit, of medium size, oblong, recurved point; yellowish white, with red cheek; flesh melting, juicy, and of highest flavor; very sweet; free-stone. Ripens beginning of June, sometimes earlier.

EARLY LOUISE.

Very thin skin and delicate aroma; excellent for home use, but too tender to ship to any great distance; matures early in June. Tree very prolific.

BEACH'S PERIODICAL.

Produced from a Florida seedling; a strong, healthy grower; free-stone; flesh, white, slightly streaked with red; juicy, and fine flavor; free-stone, large size; tree a prolific bearer. Fruit ripens from July to September.

MAY.

Good grower; free-stone; fruit excellent. Ripens in May and June.

NOVEMBER.

A very strong grower; ripens October and November; fruit white, with a blush; medium size, and good quality. A Florida seedling.

PLUMS.

The plum-tree likes plenty of water; hence, moist (but not wet) lands are best adapted to its growth. It does well in sandy soil, but better if there be clay near the surface.

For years back the plum, like the pear, has been subject to

the attacks of a special enemy that has well nigh ruined the business of their culture as market fruits; with the pear, it was the "blight;" with the plum, an insect, the *Cureulio*.

But just as a new race of pears has been found to resist the "blight," so has there been found, for the South, especially, a new race of plums, proof against *Cureulio*. These are the several varieties of the improved Chickasaw type, as follows:

CUMBERLAND.

Large, yellow, juicy, sweet, and very good. Matures in September.

DE CARADENE.

Medium, round, yellow, with brown red cheek; juicy, sweet, and of fine flavor; a remarkably fine plum. Ripens early in June.

WILD GOOSE.

Large, somewhat oblong; bright vermillion red; juicy, sweet, good quality; a cling-stone; a very showy and fine market fruit, and a prolific bearer; the most profitable of all the Chickasaw type.

HATTIE.

Medium, round, bright red; very sweet, and of good quality. Follows the Wild Goose in maturity.

NEWMAN'S.

Medium, bright red, round; a cling-stone; quality good. Ripens early in July.

All of these plums named above should be picked as soon as they commence to color, and ripened in the house, where, in three days' time they will acquire a brilliant color. If left on the tree too long the fruit drops, and never attains the quality of that which is house-ripened. This gradual ripening allows these varieties to carry perfectly to distant markets.

PEACH-LEAVED, OR KANAWHA.

Medium, oblong, bright vermillion, juicy, fine flavored; quality very good. Ripens in September. Although it begins

to color in July, it is not fit to use until it ripens upon the tree, two months later.

LOQUAT, OR JAPAN PLUM.

This valuable fruit is generally known in Florida under the latter title, which is an entire *misnomer*. There is a true Japan plum, but it is not an evergreen, as is the Loquat.

This tree is not only a very ornamental one, with large, evergreen leaves, but it is destined to become one of the leading fruits of Florida; it has been introduced into California, but rarely fruits there, as the early blossoms are almost invariably nipped by severe frosts.

In Florida the fruit matures without danger of loss, and wherever the orange tree flourishes, there the so-called Japan plum flourishes also.

It grows slowly at first, but after the first three years, increases in size more rapidly, and by its eighth year frequently attains a height of twelve or fourteen feet, and is covered with fruit and bloom; the ultimate height of the Loquat is about twenty feet.

The fruit ripens from January to March, and is of good quality, sub-acid, and a general favorite; excellent preserves are made of it; and as for its jelly, it has no superior among the many jellies offered for sale in the markets.

The fruit, resembling an ordinary plum in size and shape, carries as well, and in fact better, than the peach. It has been shipped to the Northern markets in perfect order, selling there from twenty-five to forty cents a quart-basket.

In the Florida local markets it sells readily at twenty-five to fifty cents a quart.

The tree, if well cared for, commences to bear in its fifth year, and when covered with bloom, fills the air with a delicious fragrance.

CHAPTER XXIII.

JAPANESE PERSIMMON, OR DATE PLUM.

Among the fruits quite recently introduced into Florida, and, indeed, in the United States, is the *Diospyros Kaki*, or Japanese Persimmon.

Wherever it has been tried—and many are now scattered all over the State—it has done well; even the imported trees have given a satisfactory account of themselves; and now that our nurserymen have succeeded in propagating it on the wild persimmon stock that grows luxuriantly on pine land and hammock alike, we may look for still better results.

Its successful culture and great profit to the grower is fully established, and henceforth the Japanese Persimmon will rank as one of Florida's favorite fruits.

In Japan, it is considered the choicest and most popular of all the many fruits of that favored country.

There are several varieties, some conical in shape, some round, and do not at all resemble in any respect the typical "persimmon" of our own land.

The fruit of the finer varieties is of a beautiful yellow or red color, and measures from three to four inches in height, and from eight to nine inches in circumference; of seeds, it has from five to seven of a small size.

The fruit ripens without frost from September to March, and its flavor is so delicious that it is said to be readily understood why it is so great a favorite in Japan, where its different varieties have been so carefully crossed and recrossed, that it has become, to that country, what the apple is to the United States.

The dried fruit is as palatable as the fresh, is fully the equal of the fig, and can be kept a long time; moreover, the Japanese Persimmon, or Date Plum, as it is often more properly called,

is a fine shipping fruit, and will bear transportation safely to great distances.

The tree is highly ornamental; leaves dark, glossy green, shape symmetrical; it is a very prolific bearer, is as hardy as a pear-tree, and fruits sooner. The seedling tree bears in about ten years, but is apt to "sport," and hence is not desirable, because not reliable.

Budded trees fruit in from one to three years; they prefer a light, sandy soil, are not affected by curculio, grow to a large size, and attain the age of a hundred years, while losing none of their vigor.

A number of varieties have been introduced into the United States; and of these there are two principal divisions, one of which is large, round, and shaped like a greening apple. The flesh of this variety resembles that of the pear or apple, and is eaten in the same way; it is unsurpassed for the table, and considered equal to the peach and pear. Its color is a rich golden hue, and the flesh "juicy, vinous, and firm." This variety should be inclosed in a tight cask for a few days after picking, to render it perfect.

The other variety is oblong, like a "Minie ball" in shape; "it is soft, sweet, and custard-like, is eaten with a spoon, and with cream and sugar is one of the most delicious fruits that is known."

The fruit of this variety attains a very large size, and owing to the large amount of saccharine matter it contains, is the sort usually dried, and prepared like figs for market. In this form it is sold as sweetmeats in the shops of Japan.

Professor W. E. Griffis, the author of "*The Mikado's Empire*," tells us:

"As regards the value of the Japanese Persimmon, there can be but one opinion, the tree itself is one of the handsomest of fruit trees, and in the fall, with its golden-hued fruit hanging to the branches after the leaves have fallen, forms a beautiful and striking picture in a landscape. As to the fruit itself, it is nutritious, palatable, and to a high degree charged with those chemical ingredients which give most fruits their value in pre-

serving the health and purifying the blood. This fact is insisted on by the Japanese doctors, some of whom I have known to cure their patients by a 'persimmon cure,' like that of the 'grape cure' of Southern Europe."

The following are the best varieties, so far introduced into the United States, and for sale by our principal Florida nurserymen:

TANEASHI, OR SEEDLESS.

Very fine, large, oblong; flesh, soft; color, dark red, with black spots.

IMPERIAL.

Shaped like an acorn or Minie ball; very large, with dark stripes on the surface; flesh, soft when ripe, sweet and fine.

ROYAL.

Nearly round; pale yellow; large size; early. Ripens on tree; good for drying.

AMONG.

Large, round, a little flattened; orange color.

MINOKAKI.

Very large, oblong, pointed; highly colored, often without seeds.

HYAKAME.

Largest known, and of the very best quality.

MIKADO.

Flat like a tomato; medium sized; bright yellow; flesh, solid.

TAIKOU.

Round, pale or greenish yellow; fair size.

NIHON.

Slightly oblong; yellowish red; black spots on the surface, and in the flesh; flesh, solid; very early.

DIAMIO.

Slightly oblong; reddish, with dark point; medium size; flesh, soft.

DIE-DIE MAWELL.

Large and round, with slight point at apex.

HAYCHUYA.

Large, oblong, rich color; one of the best.

CHAPTER XXIV.

HOW TO USE FLORIDA FRUITS.—ORANGES.

ORANGE WINE, NO. 1.

Take perfectly ripe, sweet oranges ; the riper the better, as then the saccharine matter is entirely developed ; peel, and cut into halves across the cells ; cut over a tub, so as not to lose any juice, and squeeze both halves hard before dropping in the tub. When the tub is full, put the whole mass through a wine-press, which must be so close that none of the seeds can escape into the mush, as they would give the wine a bitter taste.

To each gallon of juice add one pound of granulated or loaf-sugar, and to each gallon of this mixed juice add one quart of pure water. Put the whole in a barrel, leaving a space of about five gallons for expansion of the wine during fermentation.

Orange wine has to undergo the lower fermentation, as by the upper fermentation all the volatile matter and the aroma would escape. The barrel must be closed air-tight, and a fermenting tube adjusted ; the fermentation is very vigorous for the first few days, and the barrel must be closely watched to prevent its bursting ; the fermentation subsides gradually after a few days, then the wine has to be racked off, and the lee can be filtered. The fermenting tube must be adjusted again to the new barrel, to remain until the fermentation shall have ceased entirely. Rack the wine off again in about six weeks after the latter period, and in a month after this second racking it will be fit for market, as there is no second, or "spring" fermentation, as with grape wines.

ORANGE WINE, NO. 2.

Ninety sweet oranges, thirty-two pounds of lump sugar ; break sugar in small pieces, and put it in a dry, sweet nine-gallon cask ; place the latter where it is to remain. Have ready close to the cask two large pans, or small tubs ; put the orange

peels, pared thin, into one, and into the other the pulp, after the juice has been squeezed from it; strain the juice carefully, and put it in the cask; then pour one-and-a-half gallons of water on both peels and pulp; let it stand for twenty-four hours, then strain into the cask; add more water to peels and pulp; next day strain into cask. Repeat this process until the cask is filled, which should take just seven days to accomplish, the water being properly proportioned to this end, and the contents of the cask being stirred each day. On the third day after the cask is full, it may be securely bunged down.

This is a very simple and easy method, and if directions are followed, the wine cannot fail to be excellent. It should be bottled in eight months, and will be fit for use twelve months after making.

ORANGE WINE, NO. 3.

Juice of sweet oranges and water, equal parts; to every gallon add three pounds of raw Florida sugar; place in tight barrel, filled, with a bent tube from the closed bung-hole to a pail of water; when the gas bubbles cease to show in the water, close the barrel; leave it undisturbed for four months; then bottle, and cork tight. This makes a very fine wine, that will keep well in wood or glass.

ORANGE WINE, NO. 4.

To each gallon of the juice of the wild or sour oranges, add three gallons of water and three pounds of granulated sugar; then proceed as directed for Orange Wine, No. 1. This makes a sweet, cordial-like wine.

Orange wine is of an amber color, tastes like dry Hock, but always retains a decided aroma of the orange.

Twelve hundred sour, or fifteen hundred sweet oranges, will make forty-five gallons of wine at from \$3 to \$6 per gallon, and ten gallons of vinegar at twenty-five cents per gallon, wholesale.

ORANGE VINEGAR.

To the cakes which are left in the presses, after making

wine, add molasses and water, according to judgment; let it stand until vinegar is formed; then strain and bottle, or place in casks.

ORANGE MARMALADE, NO. 1.

Forty sour oranges; peel, and set pulp aside till next day; soak peels in water (rain-water preferred) for twenty-four hours, changing the water four times; then boil peels in a porcelain lined kettle till tender, changing water three times, using boiling water each time, and keeping the last used water for use as follows: Take out the peels, drain, and spread out on a flat dish or waiter; put into the kettle the orange pulp, squeezing each piece in the hand; add three pints of the water saved from the peels, and boil for one hour. While this is boiling, scrape off all the white from the peels; then shred or chop the yellow portion into fine pieces; next, strain the contents of the kettle several times till it is as clear as amber (there should be about seven-and-a-half pints of juice, if there is not add enough of the water the peels were boiled in to make up the difference.) To this quantity of juice add ten pounds of white sugar; let it come to a boil; then add the shredded peels, about five pints; let it boil all together for about one hour and a quarter, or until it begins to jelly.

ORANGE MARMALADE, NO. 2.

Of oranges and sugar, allow pound for pound; pare half the oranges, and cut the rind into shreds; boil in three waters until tender, and set aside; grate the rind of the remaining oranges, take off, and throw away every bit of the white inner skin; quarter all the oranges, and take out the seeds; chop, or cut them into small pieces; drain all the juice that will come away without pressing them, over the sugar; heat this, stirring until the sugar is dissolved, adding a *very* little water if the oranges are not very juicy; boil and skim five or six minutes; put in the boiled shreds and cook ten minutes; then the chopped fruit and grated peel, and boil twenty minutes longer. When cold, put into small jars, tied up, with bladder or paper next the fruit, and cloths dipped in wax over all.

PRESERVED ORANGE PEEL.

Weigh the oranges whole, and allow pound for pound ; peel the fruit, and cut the rind into narrow shreds ; boil until tender, changing the water twice, and replenishing with hot each time. Squeeze the orange juice through a strainer over the sugar ; let this heat to a boil ; put in the shreds, and boil twenty minutes.

ORANGE JELLY.

One pint of water, two ounces of gelatine, half a pound of loaf-sugar, ten oranges, and one lemon ; put water, gelatine, sugar, rind of one orange, and rind of half a lemon into a saucepan together, and stir over the fire until the gelatine is dissolved ; remove the scum ; then add juice of lemon and oranges, sufficient to make one pint ; stir together until on the point of boiling ; then strain through a jelly bag or fine sieve ; and when nearly cold, place in a mould previously wetted.

PRESERVED ORANGES.

Take small oranges, and rather more than their weight in white sugar ; slightly grate the fruit, and score round and round with a knife, but not very deep ; put the oranges in cold water for three days, changing the water two or three times a day ; tie them up in a cloth ; boil them till they are soft enough for the head of a pin to penetrate the skin. While they are boiling, place the sugar on the fire, with rather more than half a pint of water to each pound ; let it boil for a minute or two, then strain it through muslin ; put the oranges into the syrup till it jellies and is of a yellow color ; try the syrup by putting some to cool ; it must not be too stiff ; the syrup need not cover the oranges, but they must be turned, so that each part is thoroughly done.

ORANGE CREAM.

One-and-a-half ounces of gelatine, one lemon, six large oranges, sugar to taste, water, half a pint of good cream ; squeeze juice from oranges and lemon, strain, and put in saucepan with gelatine, and enough water to make juice up to one-and-a-half pints ; rule the sugar on the orange and lemon rind, add to it

the other materials, and boil for about ten minutes ; then strain through jelly bag, and, when cold, beat up with it half a pint of thick cream ; then pour into wet mould.

ORANGE TINCTURE.

Peel off the yellow part of the rind very thin, and cover with alcohol in a tightly corked bottle ; when the tincture is bright yellow, pour off into another bottle for use in flavoring puddings, custards, cakes, etc.

LEMONS—LEMON TINCTURE.

Is made exactly the same as orange tincture, given above.

PICKLED LEMONS.

Cut the lemons in quarters, not entirely apart, and put a tea-spoonful of salt in each one ; put them where they will dry either in the hot sun or by the stove ; when they are dried so that they are black, and look good-for-nothing, prepare the vinegar with cloves, cinnamon, nutmeg, ginger-root, onion, and a little mustard seed, and pour it boiling hot over the lemons ; keep a year before using. They are quite equal to the West India limes. They require more vinegar than other pickles, as the lemons will swell out to their natural size.

LEMON JELLY.

For Layer Cake.—Two cups of sugar, yolks of three eggs, juice of two lemons ; cork till thickened by setting in boiling water, and then add the well-beaten whites of three eggs ; spread between layers of cake.

LEMON CREAM.

One pint of cream or new milk, yolks of two eggs, quarter-pound of white sugar, one large or two small lemons, and one ounce of gelatine ; put the cream into a saucepan, with the sugar, lemon-peel and gelatine, and simmer over a gentle fire for ten minutes, stirring all the time ; then strain into a jug, add the well-beaten yolks of two eggs, and put the jug into a p a

of boiling water ; stir the mixture one way until it thickens, but do not allow it to boil ; take off, and stir till nearly cold ; strain the lemon-juice, and stir in gradually till well mixed ; then pour into a well-oiled mould.

PRESERVED LEMON PEEL.

Is made according to recipe given for orange peel, or as follows : Make a thick syrup of white sugar, chop thick lemon peels very fine, and boil in the syrup ten minutes ; put in glass tumblers, and paste paper over ; a tea-spoonful of this conserve gives a delicious flavor to cakes, puddings, etc.

LEMON SYRUP.

Squeeze lemons, and strain juice carefully ; then place in a broad, open dish, and add all the granulated sugar it will dissolve ; let it stand for several days, and stir and add sugar occasionally till it will take up no more ; then bottle, and seal closely ; keep in a dark place, and cool as possible. A table-spoonful to a tumbler of water makes a refreshing summer drink.

NOURISHING LEMONADE.

Pint-and-a-half of boiling water, juice of four lemons, rinds of two, a half pint of sherry, four eggs, and six ounces of white sugar. Pare the lemon rinds thinly, put it in a jug with the sugar, and pour on the boiling water ; let it cool, then strain it, add the wine, lemon-juice, and well-beaten eggs, also strained, and the beverage will be ready for use. If desired, the sherry and water may be omitted, and milk put in their place.

LEMON BUTTER.

One-and-a-half cups of white sugar, whites of three eggs, yolk of one, grated rind, and juice of one-and-a-half or two small lemons ; boil gently twenty minutes, stirring all the time. Nice for tarts, or to be eaten as preserves.

LIMES—LIMES FOR PICKLING.

For Shipping to Distant Markets.—They should be a bright

yellow when picked, which should be done carefully. Place in tight barrels or casks the same day they are picked, and cover at once with a brine as salt only, as sea-water; then head up tight, and change water two or three times. Limes prepared in this way are ready for use at any time, either as pickles or preserves, by first freshening in clear water, and then following other recipes.

PICKLED LIMES

Are prepared exactly according to recipe given for "Pickled Lemons," and are equally good.

PRESERVED LIMES.

If the limes have been previously kept in brine, freshen by soaking in several waters; then proceed as follows, same as if just picked: Take out the seeds, and place in cold water for twenty-four hours, changing the water several times; boil until tender in water, to which a little soda has been added; soak again in water for twenty-four hours, changing water as before; the limes are now ready to preserve; to each pound of fruit, take two pounds of white sugar and three pints of water; make a syrup first, drop the fruit into it, and cook long enough to become thoroughly heated through; place limes in jars set in hot water, boil the syrup down a little, and turn over them. Seal up the same as any other preserves.

CITRON—TO DRY FOR HOME OR MARKET.

Pick the fruit when green, just as it comes to maturity; cut into four or six pieces; soak in clear water twelve hours; boil half an hour in water containing a little alum, and a few handfuls of green grass (Guinea preferred), or the leaves of the citron tree; pour this off, and boil half an hour in thin syrup; then weigh the citron, and add an equal weight of white sugar to the syrup; dip the citron into the latter two or three times; dry in the sun one day; the second day fill the cavities of the citron with the syrup, and continue to expose to the sun until thoroughly dry. This makes an excellent article for commerce,

being of superior quality to that sold in the stores at fifty to sixty cents a pound.

PRESERVED CITRON.

Never use ripe citron in any shape; it will not dry, nor make a good preserve. Take green citron, full grown, but young and tender; cut into four pieces, and take out pulp and seeds; lay the citron in salt and water for twenty-four hours; take it out and scald it two or three times until the bitter is extracted; then make a moderately thick syrup, and boil the citron in it gently until clear and translucent; then flavor syrup with lemon-juice, all-spice berries, stick cinnamon, or root-ginger.

GRAPE FRUIT, OR POMOLA.

This fruit is used only in its original state, eaten as an orange, or prepared for the table by carefully removing all the inner membranous skin and seeds, and then sugaring the fruit an hour or two before sending to table. The inner skins part readily from the pulp, which is very juicy, and great care should be taken not to leave any of the former clinging to the pulp, as it is very bitter; properly prepared, there is no fruit more refreshing than the Pomola. The juice also makes a very pleasant drink, prepared the same as lemon or lime-ade.

PINE-APPLES—PINE-APPLE AND TAPIOCA PUDDING.

Soak a tea-cupful of tapioca in a pint water for two or three hours; then add one quart of milk, two beaten eggs, two-thirds of a cup of sugar, a little salt, and a table-spoonful of butter; bake in a buttered dish, stirring occasionally at first; when done, it must be quite stiff; turn on to a platter, and pour over a pint of canned pine-apple, or uncooked pine-apple, previously cut into little dice; sprinkle with sugar, and cover tightly for an hour or two before using. Serve cold.

PINE-APPLE CHAMPAGNE, OR "CHICHA."

The latter is the proper title of this delicious and favorite drink of tropical countries; it is a Spanish name, and pro-

nounced as if spelled *chee-chee*. Over the peelings oft wo small pine-apples, pour one quart of boiling water ; allow it to steep until cold ; then sweeten to taste, strain and bottle, corking tight ; tie down the cork and place the bottle on its side ; if placed in a warm place, it will be ripe in twenty-four hours. A small piece of ginger placed in each bottle will improve the flavor. The whole pine-apple, chopped, can be used, if desired.

PINE-APPLE-ADE.

Boil the pine-apple or skins, allow liquid to cool, then strain, add lemon or lime-juice, and sweeten to taste.

Recipes for making a preserve and for candying pine-apples being found in all cook-books, we will not repeat them here.

GUAVAS—GUAVA JELLY.

This is a jelly that has a world-wide reputation, although the Havana article, so familiar to the public, is really no jelly at all, but the fruit stewed down to a smooth mass—a marmalade, in fact. True guava jelly, as made by the following recipe, is as clear and beautiful as crab-apple or quince jelly, and varies in color from a pale amber to a light claret, according to the varieties of the fruit : Either the parings, or the whole fruit (ripe, but not too ripe), cut up, may be used. It is a good plan, when paring guavas for the table (like peaches eaten with sugar and cream), to put the skins into a small kettle, with also the centres of the fruit, containing a majority of the seeds, and make jelly of them, a few glasses at a time, as the guava jellies, best in small quantities. Put just enough water in the kettle to keep the fruit from burning before the juices are extracted. Let it boil for an hour or more, until well cooked, then strain through a rather coarse bag ; do not squeeze it at all, or if you do, strain again through a fine cloth, measure the juice, let it boil a few moments, then add granulated sugar, one and a half measures, to each one of the juice, and the juice of one or two lemons ; skim carefully, watch closely, and the moment it ropes, or falls in large drops, remove and place in glasses.

GUAVA MARMALADE.

Follow recipes given in ordinary cook-books for peach marmalade, except that the guava pulp should be rubbed through a seive, to get out the seeds. This, however, is not absolutely necessary.

SPICED GUAVAS—CANNED GUAVAS.

Are prepared according to usual recipes for spiced and canned fruits.

BANANAS—FRIED BANANAS.

Peel and slice the fruit, sprinkle with salt, dip them in thin batter and fry in butter. Serve immediately.

FROZEN BANANA PUDDING.

Make an ice-cream of two quarts of cream, one of milk, and one pound of white sugar; stir this well together and freeze hard enough to put into a mold; line the top of the mold with slices of banana about an inch apart; then a layer of ice-cream; then another layer of bananas, and a little pounded sweet almonds; then ice-cream, and so on, until the mold is full; cover it with a cloth, put on the tin cover tightly, and pack in salt and ice for three or four hours. Bananas sliced across make a pleasant addition to a dish of grape-fruit.

GRAPES—WILD GRAPE WINE.

The small wild grape that grows wild in such luxuriance in the Florida hammocks, makes an excellent wine, as follows: Mash the grapes in a large tub, or bowl, and let them stand until there are signs of fermentation setting in; then strain the juice by dripping through a flannel bag. To three quarts of juice add one quart of water and three pounds of light-brown sugar. Put it away in a demijohn, in a moderately warm place, and tie up the mouth closely with a piece of thin muslin. Do not cork until fermentation is complete.

DOMESTIC GRAPE WINE.

Put twenty pounds of ripe grapes in a stone jar, and pour

on them six quarts of boiling water. As soon as the water is cool enough, squeeze the grapes with the hand; cover the jar with a cloth and let it stand for three days; then press out the juice and add ten pounds of crushed sugar. After it has stood for a week, scum, strain, and bottle it, corking loosely. When the fermentation is complete, strain it again and bottle it, corking tightly. Lay the bottles on their side in a cool place.

HOW TO KEEP GRAPES.

Take full bunches, ripe and perfect; cut the stem off smooth, and seal by dipping it in hot sealing-wax; let them lie one day, to make sure they are perfectly sealed; if not, they will shrivel. If they are all right, pack them in a box in layers, with dry saw-dust or sand; make the box as air-tight as possible. By this method they will keep for months in perfect condition.

FIGS.—TO DRY FIGS.

Gather the figs when the skins begin to crack (which is a sign of maturity, and the fruit contains the largest amount of saccharine matter); make a strong lye of oak ashes, or common cooking soda dissolved in hot water; quickly dip the figs (in a wire basket) into the hot liquid, and remove immediately; expose to the air for a minute or two, and repeat the dipping. If the lye is hot and strong enough, the color of the fig will immediately change, the dark varieties to a bright green, and the pale-colored to a pale-green. Place the figs upon trays made of wooden slabs, and expose to the sun, taking care not to allow the dew to fall upon them. After a few days they are ready to be put away in small wooden boxes, first putting a layer of spice, laurel, or bay leaves at the bottom, and another at the top. Put the lid on light to keep insects out. Figs placed in a dry room will keep a long time. An evaporator, either purchased, or such an one as is described in the chapter on guavas, will greatly facilitate the drying process; but great care must be taken not to give too much heat. So soon as the figs show signs of secreting syrup, too much heat has been applied, and they will make only an inferior article. The fruit should be

turned frequently in drying, and after the second day it is advisable to lightly press the fruit with the hand, in order to flatten it. The light-colored varieties are preferred for drying, although some of the dark-skinned, especially the Brown Turtsey, make a very good article.

PICKLED FIGS.

Pick the fruit, with the stems left on; it must be matured, but not very soft; place it in a jar; sprinkle the layers with salt, in the proportion of a half pound to a peck of figs; pour on boiling water to cover, and let it stand twelve hours; then put the fruit in a colander, and rinse with clear, cold water. Fill jars with the figs; take strong vinegar, add a quarter of a pound of sugar to each quart; boil, and pour the hot vinegar over the fruit. In filling the jars with the fruit, cinnamon bark, cloves, and any other spices desired, should be scattered through it.

FIG PIE.

A delicate dessert. For each pie, chop half a pound of figs (dried or fresh) very fine, and cook them up with a cup of cold water, or part cider or brandy, and part water; when the figs are soft and smooth, let cool, and add the beaten yolk of an egg, put in crust, and bake; make a meringue of the white of the eggs, beaten stiff, with two tablespoonfuls of powdered sugar beaten in it; flavor with vanilla. As soon as the crust is done, draw the pie to the oven door (don't take it out), spread this on top, and let it set for a minute or two—not longer.

FIG PUDDING.

Three-quarters pound of grated bread, half pound figs, six ounces suet, six ounces brown sugar, one teacup of milk, and grate a little nutmeg; chop figs and suet together; then mix in the bread sugar and milk, and, lastly, one egg, well beaten. Boil in a mold four hours. Serve hot, with sweet sauce.

FIG CANDY.

One pound sugar; three-quarters of a pint of water, and set

over a slow fire ; when done, add a few drops of vinegar, and a lump of sugar, and pour into jars in which slices of dried figs have been laid.

The fresh fig, as gathered from the tree, is a favorite dish, cut and sugared, and eaten with cream. It is also much used as an ordinary stewed fruit.

CHAPTER XXV.

EVAPORATING FRUITS.

Our work on "Florida Fruits" would not be complete without a reference to a comparatively new industry, which is destined to be a revelation of wealth to the fruit and vegetable growers, not alone of Florida and the United States, but of all countries. A revelation of wealth, on the principle that a "penny saved is a penny earned." Wherever fruit or truck is raised for market, there is sure to be a waste of unsaleable produce, which could be utilized for home use, if there was not "too much of a good thing," which, however, there is, and so a great deal spoils and is lost. Another thing, in many places, especially in newly-settled States, like our Florida, it is very difficult, if not impossible, to get perishable produce to market in good condition, hence people living in these localities are cautious about raising such products. But modern invention has swept away this heretofore serious drawback. The farmer, or fruit-grower, may now plant what he will, gather as he will, and then quietly place the result of his labor in such shape as shall assure him a large and sure profit, without the possibility of loss, no matter how far he may be from the great markets, nor how slow his means of transportation. Nay, more—he may prepare his produce and pack it away, to await the highest market prices, instead of being obliged to place it on sale when the field is already over-occupied. Neither is the produce thus rescued from waste and low prices in poor demand; on the contrary the supply will scarce be able to keep pace with it; if the article supplied be the best of its sort, a good price and ready sale is always sure. The recent invention which has brought so great a boon, not only to the producer, but to the consumer, is that of the evaporation of fruit and vegetables. To be sure, they were "evaporated" years ago, and placed on the market with a

great *furor*; but the principle then employed was totally incorrect, and the result correspondingly disappointing to all concerned. The fruit offered was really cooked and then dried, and not genuinely evaporated at all. The trays were placed one above the other, in a box or chamber; the hot vapor, or steam, from below was augmented by the moisture from the contents of the lower trays, and the result was that the fruit swelled just as though it had been cooked, the delicate membranous cells burst asunder, and the starch they contained, instead of being converted into grape-sugar or glucose, acidified, and thus both the sweetness and the flavor of the fruit, which is an essential oil held prisoner by these same little cells, dissipated, and consequently the whole character of the fruit was changed. The "salt" had "lost its savor," hence "evaporated" fruits took no hold on public favor, and those who had invested in expensive driers soon abandoned their use, the universal verdict being that "it did not pay." And yet all felt that there existed a satisfactory solution of the vexed question of perfect evaporation, and within the last few years it has been solved completely, by the invention of the "American Fruit Drier," or evaporator—Dr. Ryder.

He set aside, from the beginning, the erroneous idea, upon which the vertical evaporators were constructed, that "evaporated produce should be retained and finished in a humid atmosphere, entering at the point of greatest humidity and finishing at the point of greatest heat." Water in "dried fruit" means decay, acetous fermentation, and consequent loss of sweetness and flavor. This theory had failed lamentably in practice; so Dr. Ryder adopted the opposite as the true method, and the result of his patient investigation is, what the writer, after careful study and observation, fears not to pronounce the *ne plus ultra* of an evaporator.

No one, even though blindfolded, can taste or smell a slice of fruit or vegetable evaporated by the "American," without at once distinguishing the name of the crude article. So perfectly is the flavor preserved, no mistake can be made about it; and here is just the difference of product between the old vertical

method and vapor bath, and the "American's" inclined flue and "hot air cure;" a difference that is just as noticeable to the eye, in color and handsome appearance, as it is to the palate in quality.

So you see that there is a right and a wrong way of evaporating fruits and vegetables, and it was the misfortune of the wrong method coming first under notice that for a time threw the whole business of evaporating the products of the soil into the shade.

In the past, as a rule, dried fruits have been literally "flat, stale, and objectionable;" but now, under Dr. Ryder's common-sense method, evaporated fruits are rapidly coming into public favor, and there they will stay.

In many cases, the producer who uses the best evaporator (and we can truly say, having the welfare of our fellow-fruit growers at heart) that this is the "American Dryer, or Pneumatic Evaporator," will find that it will pay better to convert all his produce into the evaporated article for market, than to ship it in its original state.

The saving in crates, in hauling, in handling, in freight, and in loss by decay in transit—very important items to the Floridian—would greatly augment the profits of the crop, besides being perfectly safe.

The demand for evaporated fruits and vegetables will, for years to come, fall far short of the supply, where the supply is of the best quality. People are finding out of late that they are not only very wholesome, but that they are cheaper than canned fruits. To prove this, one need only buy a can of any sort, and its equivalent in cost in the best evaporated fruits; place the latter in water for eight or ten hours (which should always be done previous to stewing slowly), and then try to put it in the empty can, the result will be a revelation most damaging to the canned article.

The truth is that every agricultural family ought to own one of these evaporators; one of the smaller sizes will suffice to save many and many a dollar's worth of good, wholesome food, that must otherwise be wasted; and this is particularly so in

Florida, where, during the heat of the summer months, fruits and vegetables are apt to be scarce.

The farmer who owns one of these improved evaporators—and the number is daily increasing, for there is no farm implement that will pay its cost so quickly, or so often in a season—the farmer, we say, who owns one of these, can, during the season of plenty, dry all his surplus peas, beans, sweet-corn, tomatoes, potatoes, both sweet and Irish, turnips, beets, cabbages, or onions; it needs only then to tie them up in paper or close muslin bags to “bar out” insects, and when needed for use, to soak them for a few hours, and cook slowly. It is no light thing, as every householder knows, to have fresh vegetables on hand at all seasons.

In this one respect alone, apart from all commercial considerations, we cannot overestimate the value of these money and labor savers.

And the same is true of fruits; in the season of plenty, blackberries, strawberries, mulberries, huckleberries, plums, peaches, pears, pine-apples, guavas, may be preserved for future use with the greatest ease, and without the expense of glass jars, cans, or sugar.

In one season the ordinary farmer, curing for home consumption only, can save double the cost of this busy little worker, which has yet another popular qualification: it is cheap, far cheaper than the vertical machines, which really destroy the fruit rather than preserve it.

There is a No. 6 size that will dry three bushels of, say, guavas a day, weighs two hundred pounds, and costs \$25; then there is a No. 1, which evaporates six to eight bushels a day, weighs three hundred and fifty pounds, and costs \$50.

Three larger sizes are made, designed for more extensive work: No. 2, costing \$75, cures from 12 to fifteen bushels a day; No. 3 costs \$175, and evaporates forty-five bushels; No. 4, which weighs a ton, and swallows one hundred and ten bushels, costs \$350; and No. 5, made only to order, costing \$450, and eating up one hundred and fifty bushels at a day's meal.

And still further to facilitate matters, these same manufacturers—called, by-the-way, “The American Manufacturing Company of Waynesborough, Pennsylvania”—place on the market a “Parer, Corer, and Slicer,” which performs its triple work at one time, and costs only a dollar and a half; and an “Improved Rotary Knife Peach Parer,” same price; also a “Peach Peeling Spoon” for twenty cents. Thus is evaporating made easy.”

Any one who chooses to send to this Company for the catalogue of their Fruit Drier, will learn a great deal to arouse his attention and interest in a subject that grows in importance as one looks into it; and we will further add, that with every Drier full and money-making instructions are sent.

We have elsewhere referred to the great profit of raising the guava—our Florida apple, as it may well be called. The subject of jelly-making is, as we have seen, one of immense moment; but not every one is able to command the needful labor to place his fruit in this saleable form, and so there is a great deal of waste, as things are at present, but need be no more; for, with even one of the small evaporators, all the loss may be made gain, besides that the outlay of work, time, and capital are much less than in jelly-making.

We believe that the drying of guavas for home use and the Northern markets will, within a few years, become one of Florida's great industries.

Pare and slice the larger specimens—the “Peach Parer” would lighten the work wonderfully—halve the smaller ones, and then lay them in the warm embrace of the “American;” then pack them in neat two-pound paper boxes, such as are made for such uses, and ship them off, forty boxes to a crate; they will readily bring thirty-five cents a pound; seventy cents for each box.

Now, one bushel of guavas will weigh, dried, at least eight pounds; this, at the above price (and it is less), will yield \$2.60 per bushel; each bushel, as prepared for market, occupying only the space of four small boxes, and weighing only eight pounds, would make the expenses of shipment very light. An allowance of forty cents a bushel, inclusive of all expenses, would be am-

ple, and this leaves a clear profit of \$2.20 per bushel, or \$11 on the crate of five bushels, with no risks of arriving "in bad condition."

That there will be a large and increasing demand, once guavas in this shape are put upon the Northern markets, there is no doubt whatever.

Guava jelly is popular, but its expense puts it beyond the reach of the masses. Let them see guavas evaporated, ready at their hand to stew for the table, or to convert into jelly if they like, and we, of Florida, will have our hands full to keep up with the demand, for you know Florida alone can supply this fruit, so herein there can be no competition.

The Florida grower, even though far removed from "rapid transit," has a bonanza in this one industry alone, which is light, clean, pleasant, easily learned, can be carried on—nay, must be—under shelter, and requires very little capital.

All this applies also to pine-apples, Le Conte and Kieffer pears, peaches, figs, etc.

There is, we believe, another and most important use that the "American Drier, or Pneumatic Evaporator" can be put to—a use not possible to the vertical vapor-bath machines, because the former alone employs warm, dry air to accomplish its purpose.

At the very beginning it hardens, toughens, dries the outer surface of the article presented to it, and in this way prepares it to resist the after-expansion of the cells, when swelled by the evaporating water within.

Now, this stage of the process may, we trust, be profitably employed in coloring and curing for shipment—oranges, lemons, and limes—hardening and toughening the skin by evaporating in a few moments the water contained in the outer cells, which is the active agent in causing all the mischief in shipments to distant points.

If this hope shall be realized—and it shall be the writer's business to investigate and experiment in this direction during the coming orange season—it will be of vast importance to every grower in the State.

In due time a report on this matter will be made public.

J. E. H.

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