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**The Potential for Genetic Suppression
of Insect Populations
by Their Adaptations to Climate**

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The Potential for Genetic Suppression of Insect Populations by Their Adaptations to Climate

By W. KLASSEN, J. F. CREECH, and R. A. BELL¹

Many of our most serious insect pests have very broad geographical distributions. For example, the codling moth (*Carpocapsa pomonella* (L.)) is distributed from Canada to Argentina, and it occurs in Australia, South Africa, the Mediterranean, and throughout Europe north to the Scandinavian countries (1).² Insects with such broad distributions adapt in various ways to climate.

Many of the reports (2, 3, 5, 6) indicate that genetic differences occur between insect populations within a species with regard to (1) ability to undergo a hibernal diapause, (2) response to diapause-inducing stimuli, (3) duration of diapause, (4) temperature limits of diapause termination, (5) temperature optima for diapause termination, (6) ability to develop cold hardiness, (7) thermal constants and temperature threshold for development, (8) choice of hibernal niches and other behavioral traits associated with surviving inhospitable seasons, and (9) ability for aestival diapause, its duration and response to conditions that induce or terminate it.

Such genetic differences must exist so that adaptations of insects to climate may be appropriate to their locality. Changes in climate from locality to locality require appropriate changes in adaptations. Insects must synchronize their life cycles with the seasons so that (1) frost-sensitive stages are passed in the frost-free sea-

son, (2) feeding stages occur when food is available, and (3) no actively developing stages occur in periods of intense heat or drought. Therefore insects must be sensitive to stimuli that portend the change in seasons so that they may prepare for adverse periods.

If we can genetically disrupt the seasonal regulations or other climatic adaptations of insects, these insects may not survive. For example, if an insect population at Fargo, N. Dak., must respond to a photoperiod of 15 hours in order to enter diapause and be cold hardy in time for dangerous frosts and if we genetically modify the population so that it does not diapause until the day has shortened to 13 hours, then the population may be destroyed by the winter. Further, let us assume that this population must remain in diapause until early May, when the danger of killing frost is past and when the host plant has again become available. If we genetically shorten the diapause so that the insects resume development in March, then they would be destroyed by frost or lack of food.

Inappropriate adaptations to climate are lethal at certain times of the year; they are conditional lethal traits. We may use a conditional lethal trait or combination of conditional lethal traits to suppress or eradicate insect populations. The principle of suppressing insect populations by means of their adaptations to climate has been suggested by numerous investigators (4, 5, 7).

The purpose of this report is to show that a population may be suppressed by means of conditional lethal traits, particularly (1) when the population is held in check by partial sterility while conditional lethal genes are introduced and (2) when the population is held static by conventional means while the conditional lethal

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² Italic numbers in parentheses refer to Literature Cited, p. 10.

genes are introduced. Each conditional lethal trait may be determined by one to four genes, and two or three conditional lethal traits may be simultaneously introduced into the population.

Conditional lethal traits may be found in the genetic variations in adaptations to climate and

to seasonal regulations. A few examples are (1) inability to diapause, (2) inappropriate duration of diapause, (3) inappropriate critical thresholds of diapause-inducing stimuli such as photoperiod, temperature, or dietary factors, (4) inappropriate choice of hibernal niches, and (5) inability to develop cold hardiness.

Native Population Overflooded With Release Strain Bearing Conditional Lethal Traits

A preliminary evaluation of the potential for insect population suppression by conditional lethal traits was made by Klassen and others (5). They considered the suppressive effect of a trait determined by one, two, or three autosomal genes and by three autosomal genes plus one sex-linked gene. In addition, these authors calculated the suppressive effect when two or three conditional lethal traits, each determined by a single dominant gene, are combined in the release strain. We decided to expand these calculations and to extend them to release strains with two or three conditional lethal traits. Each trait was determined by one, two, three, or four independent genes as follows:

One Dominant Autosomal Gene.—The genotypes that were inviable when the conditional lethal trait was expressed were AA and Aa, whereas aa was the only viable genotype.

Two Autosomal Genes With Additive Effects (aabb).—In the examples computed, each of the four alleles was assigned a genotypic value of 1 or 0. The native strain AABB had a genotypic value of 4, and the release strain aabb had a genotypic value of 0. We assumed that the conditional lethal trait was expressed in individuals with genotypic values of 0, 1, and 2. Therefore AABB, AABb, and AaBB were the only viable genotypes.

Three Autosomal Genes With Additive Effects (aabbdd).—Each of the six alleles was assigned a genotypic value of 1 or 0. The native strain AABBDD had a genotypic value of 6, and the release strain aabbdd had a genotypic value of 0. We assumed that the conditional lethal trait was expressed in individuals with genotypic values of 0, 1, 2, and 3. Examples of viable genotypes were AABBDD, AaBBDD, and AABBDd.

Four Autosomal Genes With Additive Effects (aabbddde).—Each of the eight alleles was assigned a genotypic value of 1 or 0. The native strain AABBDDEE had a genotypic value of 8, and the release strain aabbddde had a genotypic value of 0. We assumed that the conditional lethal trait was expressed in individuals with genotypic values of 0, 1, 2, 3, 4, and 5. Examples of viable genotypes were AABBDDEE, AABBDDee, and AaBbDDEE.

One Dominant Sex-Linked Gene and Three Autosomal Genes With Additive Effects (a-bbddee).—The sex-linked allele a was assigned a value of 0 and its allele A was assigned a genotypic value of 3. Since A was fully dominant, the gene AA had a value of 3. The autosomal factors B, D, and E were each assigned a value of 1, and their respective alleles b, d, and e were each assigned a value of 0. We assumed that the conditional lethal trait was expressed in individuals with genotypic values of 0, 1, 2, 3, 4, and 5. Examples of viable genotypes were A-BBDDEE, AABBDDEE, and a-BBDDEE. The heterogametic sex (A-BBDDEE) was assumed to be female, and the homogametic sex (AABBDDEE) was assumed to be male.

Algebraic expressions describing the segregation of genes that determine conditional lethal traits were derived by Klassen and others (5). These authors arbitrarily assigned values or "weights" to each allele so that each genotype could be given a "genotypic value." In addition, they arbitrarily set minimum genotypic values required for survival and gave algebraic expressions to calculate the numbers of surviving genotypes in the F₁, F₂, and F₃ generations when a native population is overflooded once with a release strain homozygous for the genes

that determine the conditional lethal traits. The algebraic expressions (table 1, Appendix) enabled us to calculate the fraction (w) of the affected population that was destroyed by one or more lethal traits and to calculate the suppression of the affected population relative to a native population not subjected to population control measures.

If a strain homozygous for more than one conditional lethal gene is released into a population of native insects, these genes will become distributed throughout the population in an almost random manner by the F_3 generation, barring linkage intensities of less than 50 crossover units. Therefore we may approximately calculate the fraction of the population that would be suppressed following a single release of a strain bearing several conditional lethal traits. If the frequency of individuals without lethal trait 1 is A and the frequency without lethal trait 2 is B , then the frequency of individuals without either lethal trait is AB . Therefore the frequency of individuals with one or both lethal traits is $1-AB$, or the fraction of the population suppressed.

The suppression of the population must be calculated in relation to the uncontrolled native population. Let there be y native insects that increase θ -fold each generation. Then the numbers of insects in the parental, F_1 , F_2 , and F_n generations are

$$y, y\theta, y\theta^2, \text{ and } y\theta^n$$

Similarly if x insects with conditional lethal traits are released into a population of y native insects, then the numbers of insects in the parental, F_1 , F_2 , and F_n generations are

$$x + y, (x + y)\theta, (x + y)\theta^2, \text{ and } (x + y)\theta^n$$

In the n th generation the conditional lethal traits are expressed in a fraction (w) of the affected population. The number of survivors is

$$(1-w) (x + y)\theta^n$$

Then the relative survival is

$$(1-w) (x + y) \div y$$

The release ratio X ($X = \frac{x}{y}$) required to obtain 98- to 99.9-percent suppression in the F_1 and F_3 generations was calculated (table 2) for conditional lethal traits determined by one dominant (dom.) gene, two autosomal (auto.) genes with additive effects, three autosomal

genes with additive effects, and three autosomal genes with additive effects plus one dominant sex-linked (s.l.) gene.

The numbers in parentheses in table 2 are the genotypic values of the survivors. For example, 2 auto. (3, 4) indicates the trait is determined by two independent autosomal genes with equal and additive effects and the conditional lethal trait will not be expressed in individuals possessing three or four native-type alleles. Similarly 3 auto. + 1 s.l. (6-9) indicates that the trait is determined by three independent autosomal genes with equal and additive effects plus one sex-linked dominant gene with an effect equal to three dominant autosomal alleles. The survivors possess the native-type sex-linked allele and at least three native-type autosomal alleles, or they may lack the native-type sex-linked allele but possess all six native-type autosomal alleles. These calculations were made with an IBM System/360, Model G50 computer, as explained in the next section.

If the release strain is homozygous for only one conditional lethal trait that expresses itself in the F_1 generation, the degree of suppression obtained cannot exceed that obtained with ordinary dominant lethal mutations. However, if the genes for conditional lethal traits become randomly distributed within the population before they are expressed, the degree of suppression may increase significantly if the trait is under polyfactorial control (table 2). If the conditional lethal trait is determined by a single dominant gene, the degree of suppression cannot vary between generations.

When two conditional lethal traits are combined into a single population, release ratios varying from two to five are adequate to obtain 98-percent suppression if the traits are expressed in the F_3 generation; similarly release ratios of three to 14 will yield 99.9-percent suppression in the F_3 generation (table 2). When three conditional lethal traits are combined into a single population, release ratios of one or two will yield 98-percent suppression in the F_3 generation, and ratios of two to five will yield 99.9-percent suppression. Although these values are approximations, they were sufficiently encouraging to undertake the more precise calculations presented in the following sections.

Suppression of Population Held in Check by Partial Sterility With Conditional Lethal Traits

Calculations are presented to show the potential for population suppression by conditional lethal genes that are introduced while the population is held in check by partial sterility. Such a method might be more economical and more desirable from the standpoint of avoiding side effects to nontarget organs than that of keeping insects in check with insecticides or other control measures.

For the calculations, we assume that the level of sterility required could be induced without adversely affecting mating competitiveness, sperm competitiveness, or lifespan. The level of sterility required to hold a population constant depends on the rate of increase between generations. For example, if a population normally increased fivefold per generation, then 80-percent sterility in all individuals would prevent a change in numbers. Similarly if a population increased tenfold, then 90-percent sterility of all individuals would prevent a change. Moreover, if a population normally increased fivefold per generation, the 90-percent sterility of all individuals would cause a downward trend in numbers.

To keep a fully fertile native population in check by flooding with partially sterile individuals, slightly higher levels of sterility are required in the release strain than when all individuals of the native population are partially sterile. The smaller the release ratio, the higher the level of sterility required. Whether matings between partially sterile males and partially sterile females yield offspring has an important bearing on population trends in the calculations presented here.

In our calculations the number of individuals released in each generation remains constant, either 198,000 or 396,000; parental generation of the native population consists of 2,000 individuals. Thus the initial ratio of released to native insects is 99:1 or 198:1. However, if the target population increases, the release ratio diminishes, and the population's growth accelerates after the F_1 generation and vice versa.

If matings between partially sterile males and partially sterile females produce no offspring, the overall population is held nearly static by

the following two sets of conditions: Initial release ratio of 99:1 and 198:1, each with 90-percent sterility and a fivefold increase between generations. However, when matings between partially sterile males and partially sterile females produce offspring commensurate with the level of sterility, the population increases even when the rate of increase is only fivefold and the initial release ratio is 198:1.

Because of the complexity of the equations involved in arriving at the relative frequency distributions of genotypes and numbers of offspring, especially with three and four genes, we used a digital computer programed to generate from the F_1 genotypic identification and distribution of offspring, the F_2 , F_3 , and F_4 genotypic identifications, offspring distributions, and relative frequencies with provisions to weight the computations as dictated by the particular study performed. We programed in PL/1-F and FORTRAN IV-G and ran under release 15/16 of OS on an IBM System/360, Model 50G (128K), using three IBM 2311 direct-access storage devices for intermediate storage and an IBM 1403 500-line-per-minute printer for final output. The computer facility is located in the University Computer Center, North Dakota State University.

The method employed in arriving at the final answers on the computer is similar to and is derived from a method that might be employed if one were to compute the answers by hand (see Appendix, p. 10) If we have a native insect population consisting of y individuals with a genotypic identification of dd , and if we release a controlled population consisting of x individuals with a genotypic identification of DD , we might calculate the F_1 generation in the following way:

Let M represent male and F female members.

$$\begin{array}{ll}
 dd (M) \times dd (F) & \\
 = y^2 / (x + y) & dd \text{ males and females} \\
 DD (M) \times DD (F) & \\
 = x^2 / (x + y) & DD \text{ males and females} \\
 DD (M) \times dd (F) & \\
 = xy / (x + y) & Dd \text{ males and females} \\
 dd (M) \times DD (F) & \\
 = xy / (x + y) & Dd \text{ males and females}
 \end{array}$$

Total, where z is an arbitrary weighting factor:

$$\begin{array}{ll} zy^2/(x+y) & dd \text{ males and females} \\ zx^2/(x+y) & DD \text{ males and females} \\ 2zxy/(x+y) & Dd \text{ males and females} \end{array}$$

Similarly we might calculate the F_2 , F_3 , and F_n generations by determining what fraction of each genotype from the previous generation contributes to the current generation when all combinations of the previous generation have been determined. The following method describes our work with four genes and is generally applicable. All programs written for this study had this same form.

All possible genotypes will appear in the F_2 generation. Therefore the contribution by each F_2 mating to a particular F_3 genotype will be the same as the contribution from the same F_3 mating to the same respective F_4 genotype. This holds true for all higher generations assuming that no new genotypes are added and none of the existing ones are removed. We have provided a simplified block diagram of the general program flow and the techniques employed in developing computer programs suitable for this study (fig. 1, Appendix).

To make a computer program of this type feasible, we first developed a unique numerical representation for each genotype. Then we developed a method to compute and store the fractional contributions of all combinations of F_1 genotypes (i.e., matings) to each particular member of the F_2 generation and the fractional contributions of all combinations of F_2 genotypes to each particular F_3 genotype. The contributions of the latter remain constant for all higher order cases. Therefore upon completion of the F_3 generation "formulas," the numerical computations necessary to determine the final answers can be made. We gave each allele a unique number, and therefore we were able to give each genotype a unique number. For example, AaBbDdEe was assigned 12345678, and A-BBDdee was assigned 10335688. The genotypes with the exception of the F_1 were generated by the computer.

The first step in the program was to generate all possible genotypes that first appear in the F_2 generation. Initially the genotypic identifications for the F_1 generation were read into

the computer on punched cards. In handling the identification, each group of eight numbers in the case of four genes was treated as a set. Each number, i.e., each allele, in the set was stored in the core memory in such a way that it alone could be available at any time.

We generated the F_2 genotypes in the following manner: The starting point in obtaining all possible combinations of F_1 genotypes was to introduce two internal "pointers," P_1 and P_2 , with each pointer equal to 1. The genotypic identification sets stored in the core memory in locations relative to the pointer values were then transferred to new core locations and expanded into all possible combinations, taking eight numbers at a time. Each combination was stored immediately after its generation, and thus upon completion of the expansion process, 256 new sets existed. This array then needed to be searched to determine what genotypes had been generated and what fractional contribution to the F_2 generation had been made. Each number in the set of eight had a unique storage location, but we needed to generate a single identification number for each set (genotype). This was accomplished by adding 1 to each member of the set and then successively multiplying the eight new numbers together. For example,

storage appearance	add 1, multiply
1 2 3 4 5 6 7 8	$2 \times 3 \times 4 \times 5 \times 6 \times 7 \times 8 \times 9$
result	
362,880	

Since each identifier was unique, the result after multiplication was unique. This result was stored in one core location and thereby provided an integer number for cross-reference to the original alphabetical identification and also a single number for future computations. We then compiled a table³ of these results. The identification number of each set (genotype) was compared with all existing identification numbers in the table. If a matching number was found, this meant that this particular genotype had been previously generated and stored; if not, the result was stored in the next available position in the table.

To determine what fractional contribution

³ Refers to computer programming here and to diagram of general program flow (fig. 1, Appendix), not to text tables in this report.

had been made, results in the expansion, consisting of the 256 sets in the case of four genes, had to be checked to determine if a particular identification number had previously appeared in the expansion. When the expansion was completed, a variable (IRES) was set equal to the first member of the set. A second variable (ADDER) was set to zero. Each member of the set was then compared to IRES. If a matching member was found, ADDER was incremented by 1, and the member of the set on which the match had been made was set to zero to prevent further matchings. After all members had been checked against IRES, the variable ADDER was stored in a table at a location corresponding to the location in the table where the result of the multiplication (identification number) had been stored. The variables P_1 and P_2 were also stored in corresponding table locations in order to determine what matings had contributed the previously stored fractions to the F_2 generation.

Control was then returned to checking the remainder of the 256 sets. The variable IRES was set equal to the next nonzero member of the set, ADDER was set to zero, and the previously described program steps were executed until all 256 sets had been accounted for. Control was then returned to the original expansion process, and the variable P_2 was increased by 1. This process continued until all possible combinations of the F_1 genotypes had been made. This completed the first step of the program.

The second phase was to generate from the previous results similar tables that would be used in making the final computations for the F_3 and F_4 generations. Since all possible genotypes had already appeared, their generation for the next set of tables was not necessary. All combinations of the F_2 genotypes could be made, and each member could be directly checked against the existing table until a location relative to the first position was found by matching. Because of the massive number of combinations and resulting fractional contributions (up to 2.5 million), we could not store these numbers in core memory. The tables were written on direct-access storage devices, commonly called disk storage or disk files.

To minimize the number of searches required to find a particular matching, the existing table

was first sorted into numerical ascending order. Matchings were found by executing a binary search on the table. This reduced the average number of searches from 41 (81 maximum, one minimum) to four (seven maximum, one minimum) and considerably increased our execution speed.

As before, two pointers, P_3 and P_4 , were introduced and the process of expansion was begun. The results were intermediately stored in core memory buffer areas. When a buffer was filled, the entire contents were written into the proper disk file location, and this again resulted in increased execution speed. When this phase of the program was completed, the only remaining step was to actually compute the number of offspring or relative frequency for a particular genotype. A set of variables consisting of release ratios, numbers of offspring per mating, and levels of sterility were read into core memory on punched cards. The values for numbers of offspring for the F_1 generation were then computed from formulas that were entered at the time the source program was compiled.

The process of computing the F_2 and higher generations was then accomplished by referring to the previously generated tables. Three pointers were again introduced, P_1 to 1 and the remaining two (P_2 and P_3) to zero. Pointer P_1 was used to point to the table location of the particular genotype that was to be generated, whereas P_2 and P_3 were set equal to the previously stored table values that identified which two genotypes had been crossed to produce a particular fractional contribution to the genotype being generated. Since the values for the number of F_1 offspring were generated in the same order and the same relative storage locations were maintained as in the previously generated tables, the following formula could be applied:

Offspring (F_2) (relative location in memory determined by P_1) = (contribution/256) (fractional contribution stored in core memory and accessed by P_1) $\times$ (F_1 offspring (P_2)) (P_2 used to locate appropriate F_1 value) $\times$ (F_1 offspring (P_3)) (P_3 used to locate second appropriate F_1 value)

Therefore offspring (F_2) = (contribution (P_1)/256) $\times$ (F_1 (P_2)) $\times$ (F_1 (P_3)). The value for

the F_2 offspring was then weighted accordingly.

The process for determining the numbers of F_3 and F_4 offspring was identical except that the tables containing fractional contributions and relative locations were stored on direct-access storage devices.

The final phase was to print the results. The results of the computation process were stored in core memory and were written on the printer only when the F_1 , F_2 , F_3 , and F_4 computation processes were completed. Control was then returned to the point in the program where computations were made based on the previously computed formulas, using a new particular weighting factor.

All programs written for this study had this same basic form and were executed in a similar manner. The number of genes involved dictated the amount of core storage required, the number of genotypes generated, and the speed of execution of the entire program.

Using these computational methods, we calculated the theoretical population trends (tables 3-14) when a native population of 2,000 insects (1:1 sex ratio) was overflooded by partially sterile insects. The native and release strains differed by one to four genes, and in some instances one of the four genes was sex-linked. The rate of increase between generations was either fivefold or tenfold. Sterility of both sexes of the release strain was either 80 or 90 percent. Four releases were made to coincide with the parental, F_1 , F_2 , and F_3 generations. Each release consisted of either 198,000 or 396,000 insects (1:1 sex ratio). Matings between partially sterile males and partially sterile females were assumed to yield either no offspring or a number of offspring proportionate to their level of sterility.

In tables 3-14 the number of individuals for each genotype is rounded to the nearest whole number. However, the column totals were computed before the numbers had been rounded.

To illustrate how populations may be suppressed with genes for conditional lethal traits while the populations are held in check with partial sterility, we derived tables 16-27 from tables 3-14. (Actually the number of individuals in tables 16-27 were obtained directly from the computer printout for tables 3-14. In

this way rounding errors were minimized.) Table 15 gives the interpretations and transcriptions and the method required to derive tables 16-27 from tables 3-14. The values in tables 3-14 were obtained by introducing insects with all alleles designated by capital letters into populations with all alleles designated by lower case letters. When this was not so, certain transcriptions of lower case letters to capitals were made in order to obtain the appropriate genotypic frequencies from tables 3-14. Tables 16-27 are summarized in table 28. In establishing table 28, we arbitrarily assumed that complete suppression would be achieved when the population of individuals with viable genotypes was reduced to 30. The eight cases in table 28 are as follows:

Case	Number released	Sterility (percent)	Rate of increase
1	198,000	90	Fivefold.
2		80	Do.
3		90	Tenfold.
4		80	Do.
5	396,000	90	Fivefold.
6		80	Do.
7		90	Tenfold.
8		80	Do.

The following data about complete suppression are indicated in table 28:

(1) Polyfactorial inheritance of a conditional lethal trait may be more or less advantageous from the standpoint of complete suppression than when the trait is inherited as a single fully dominant gene, depending on the number of native-type alleles required to prevent expression of the lethal trait.

(2) The more lethal traits incorporated in the release strain, the greater is the approach to complete suppression.

(3) Complete suppression cannot be achieved when the number of insects released in each generation is 198,000, sterility is 80 percent, and the rate of increase between generations is tenfold (case 4), except in the F_4 generation when the release strain possesses three lethals (two are dominant autosomals and the third is bifactorial, requiring three native alleles to prevent expression) and when matings between partially sterile insects yield offspring proportionate to the level of sterility.

(4) The number of generations per year may profoundly affect the likelihood of complete suppression. When matings between partially sterile insects produce no offspring, the more generations per year (hence the more releases made), the greater is the likelihood for complete suppression. Generally this is also true when matings between partially sterile insects yield a number of offspring proportionate to their levels of sterility. However, when the release strain has one conditional lethal trait inherited as two autosomal genes (four native alleles required for survival) or three autosomal genes (five native alleles required for survival), then complete suppression would be achieved if the trait was expressed in the F_3 generation but not if the expression was delayed to the F_4 when 396,000 insects are released per generation that are 90 percent sterile and when the rate of increase is tenfold (case 7).

(5) When one of the traits is determined by a dominant gene on the sex chromosomes, the

number of male survivors may differ widely from the number of female survivors. Doubtless the low probability of females finding a mate when the density of males is low would have an important role in complete suppression.

If matings between partially sterile insects yield offspring partially or fully proportionate to the level of sterility, the population may become large and threaten damage to the economic host. This consideration, along with adverse effects of sterilization procedures and economic factors, should be taken into account in deciding whether the population to be completely suppressed should be held in check by partial sterility or by conventional means. In lepidopterous species partial sterility is inherited (8-10). In such species the use of partial sterility would be much more effective than indicated in our calculations in facilitating the introduction of genes for conditional lethal traits. Similar considerations would apply if the release insects differed from the native insects by one or more reciprocal chromosomal translocations.

Suppression of Population Held Static by Conventional Means With Conditional Lethal Traits

By suitable means such as application of insecticides, a population of insects may be prevented from increasing. For example, a population that increases fivefold between generations may be held static by destroying 80 percent of each generation. We calculated the effects of overflowing only the parental (spring) generation with a strain homozygous for one, two, or three conditional lethal traits. The population is assumed to remain static in all subsequent generations. We calculated the relative frequencies of each genotype in the F_1 , F_2 , F_3 , and F_4 generations by using the general methods already outlined. However, the number of insects with each genotype was divided by the total number of insects. For purposes of computation, we assumed that each mated female produced one pair of offspring and the insects were fully fertile. These values are shown in tables 29-34.

To understand the significance of these figures, consider a field of 1,000 acres with 10 insects per acre, or a total of 10,000 insects. This

low population for a number of economic pests such as the boll weevil (*Anthonomus grandis* Boheman), pink bollworm (*Pectinophora gossypiella* (Saunders)), and perhaps others is feasible and is held static, or at least is not permitted to reach economic density levels, throughout the season by using insecticide applications or other available control measures. We can calculate the effect on this population when the conditional lethal traits are expressed. The number of survivors is the product of the number of insects times the relative frequency of genotypes capable of surviving. In this example we obtain the frequency of viable genotypes from tables 29-34 and multiply this frequency by 10,000. We calculated cases 1a-15b in table 41 in order to illustrate the use of tables 29-34 and to demonstrate the potential of conditional lethal traits for population suppression. The method used to derive table 41 is shown in table 15.

Case 1 in table 41 was calculated by using table 29. With one gene the genotypic frequencies do not change from generation to genera-

tion. If 500 insects were released per acre to give a release ratio of 50:1 and if the total population (native plus released) was held static thereafter, four insects would be capable of surviving when the conditional lethal trait would be expressed in the F_2 or subsequent generations. Whether this level of survival would result in eradication would depend on the species concerned, but in all likelihood so few insects on 1,000 acres would represent eradication. In actual practice a judgment would have to be made concerning the minimum density required for survival. After this judgment is made, the release ratio required for complete suppression can be obtained from table 29.

Examination of cases 2-6 in table 41 shows that when a conditional lethal trait is determined by more than one gene, the trait may be expressed in a progressively higher proportion of individuals from generation to generation. Cases 7-15 show that when the release strain possesses more than one conditional lethal trait, the efficiency of suppression is progressively augmented in succeeding generations. If the conditional lethal traits were expressed in the last generation of the season, release ratios ranging from 10:1 to 50:1 would be adequate to decimate most populations with four generations per year. This would require releases ranging from 100 to 500 insects per acre when the natural population consists of 10 insects per acre. Higher ratios would be required if the species had fewer than four generations per year. In most instances these ratios would have to be two to five times higher to achieve the same suppression in the F_2 as in the F_4 .

If a conditional lethal trait is under the control of more than one gene in a species with two generations per year, conditional lethal genes would be about one to 10 times more efficient than dominant lethal mutations in suppressing insect populations. If the species has three generations per year, conditional lethal genes would be up to 100 times more efficient than dominant lethal mutations. Since the release of insects carrying dominant lethal mutations is considered feasible for eradicating a number of economic insects existing at low population levels, the practical significance of the condi-

tional lethal genes, if such can be found and used, is readily apparent.

We calculated the effects of overflowing a native population once every generation with a strain homozygous for one, two, or three conditional lethal traits. We assumed that appropriate measures would be taken to hold the population constant in all generations. We calculated the relative frequencies of each genotype in the F_1 , F_2 , F_3 , and F_4 generations, and these values are shown in tables 35-40.

To understand the significance of these figures, we will again consider a field of 1,000 acres with 10 insects per acre, or a total of 10,000 insects. This population is held static throughout the season with insecticide applications or other suitable means. We calculated the effect on this population when the conditional lethal traits are expressed. The number of survivors is 10,000 times the relative frequency of the genotypes capable of surviving. The latter data were obtained from tables 35-40. To demonstrate the potential of conditional lethal traits for population suppression and to illustrate the use of tables 35-40, we then calculated cases 16a-30b, as shown in table 41.

Case 16a in table 41 was calculated by using table 35. If 100 insects are released per acre during each generation (release ratios of 10:1), the frequency of viable genotypes would rapidly decline from 83 in the F_1 to 0 in the F_4 . Comparison of case 16a with cases 17-21 shows that the efficiency of suppression may be significantly greater when a conditional lethal trait is under the control of several genes than when the trait is determined by a single fully dominant factor. Cases 22-30 show that when the release strain possesses more than one conditional lethal trait, the release ratio required to destroy the population is much smaller than when the release strain possesses only one conditional lethal trait.

Release ratios ranging from 1:1 to 10:1 would be adequate to decimate most populations with four generations per year if the conditional lethal traits are expressed in the last generation. In many instances such low ratios would be adequate for species with two generations per year but not for those with one. To sup-

press a population with just two generations per year to the same extent as a population with four generations per year, we would have to

release three to 10 times as many insects per release as are required to suppress a population with four generations per year.

Discussion

The preceding calculations indicate that conditional lethal traits could be very effective in suppressing insect populations. The greatest advantage of using adaptations to climate or seasonal changes as conditional lethal traits is that these traits already exist in populations at latitudes or altitudes different from those of the locality where we desire complete suppression.

To assess the possibility of utilizing these adaptations to suppress an insect population, one would collect a strain from a locality with a distinctly different season, select the strain to apparent homozygosity for one or more traits, cross the latter to the strain from the locality

designated for suppression, and determine the expression of the traits in hybrid generations. Since temperature may modify responses to photoperiod (2), the expression of the traits in hybrid generations should be checked in an environmental chamber programed to simulate conditions in the field. In this way one could detect undesirable genotypes in the release strain. Although desirable, one need not determine precisely the inheritance of each trait. The investment required to assess the feasibility of this proposed suppression method in any particular instance would not be prohibitive.

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Appendix

The following method is used to calculate the genotypic frequencies in hybrid generations when a native population (AABB) is over-

flooded with a partially sterile release strain (aabb) in the parental, F₁, F₂, and F₃ generations.

Let these be $\bar{x}$ sabb females, $\bar{y}$ sabb males whose level of fertility is $\bar{y}$ and $\bar{y}$ AABB females, $\bar{z}$ AABB males whose level of fertility is 1. Total number of females = $\bar{x} + \bar{y} + \bar{z}$ = total number of matings. Gametes: $\bar{x}$ AABb, $\bar{y}$ sabb, female or males and $\bar{z}$ AABb females or males. Relative frequency of these kinds of matings calculated by level of fertility of female parent and by that of male parent: (1) AABb X AABb = $\frac{\bar{x}}{\bar{x} + \bar{y} + \bar{z}}$, (2) AABb X sabb = $\frac{\bar{y}}{\bar{x} + \bar{y} + \bar{z}}$; (3) sabb X sabb = $\frac{\bar{y}^2}{\bar{x} + \bar{y} + \bar{z}}$. We multiply these values by level of matings ($\bar{x} + \bar{y}$) to get total number of each kind of mating (multiplied by respective levels of fertility of either sex): (1) AABb X AABb = $\frac{\bar{x}^2}{\bar{x} + \bar{y} + \bar{z}}$, (2) AABb X sabb = $\frac{\bar{x}\bar{y}}{\bar{x} + \bar{y} + \bar{z}}$; (3) sabb X sabb = $\frac{\bar{y}^2}{\bar{x} + \bar{y} + \bar{z}}$. (3) there by multiplying pair matings, then total number of F_1 offspring in (1) AABb: $\bar{x} \cdot \frac{\bar{x}}{\bar{x} + \bar{y} + \bar{z}}$; (2) AABb: $\bar{x} \cdot \frac{\bar{y}}{\bar{x} + \bar{y} + \bar{z}}$; (3) sabb: $\bar{y} \cdot \frac{\bar{y}}{\bar{x} + \bar{y} + \bar{z}}$. Now add $\bar{x}$ sabb females and $\bar{y}$ sabb males with $\bar{z}$ fertility and we have (1) AABb: $\bar{x}$ females and $\bar{x}$ males with $\bar{z}$ fertility. Thus we get the following:

Metula	Relative frequency X asymptotic level of fertility of ϕ and
AABb X AABb	$\frac{1}{2} + (\frac{1}{2} + f + g + h + k)^2$
AABb X AABb	$\frac{1}{2} + f + (\frac{1}{2} + g + h + k)^2$
AABb X AABb	$\frac{1}{2} + g + (\frac{1}{2} + f + h + k)^2$
AABb X AABb	$\frac{1}{2} + h + (\frac{1}{2} + f + g + k)^2$
AABb X AABb	$\frac{1}{2} + k + (\frac{1}{2} + f + g + h)^2$
AABb X AABb	$\frac{1}{2} + f + (\frac{1}{2} + g + h + k)^2$
AABb X AABb	$\frac{1}{2} + g + (\frac{1}{2} + f + h + k)^2$
AABb X AABb	$\frac{1}{2} + h + (\frac{1}{2} + f + g + k)^2$
AABb X AABb	$\frac{1}{2} + k + (\frac{1}{2} + f + g + h)^2$
AABb X AABb	$\frac{1}{2} + f + (\frac{1}{2} + g + h + k)^2$
AABb X AABb	$\frac{1}{2} + g + (\frac{1}{2} + f + h + k)^2$
AABb X AABb	$\frac{1}{2} + h + (\frac{1}{2} + f + g + k)^2$
AABb X AABb	$\frac{1}{2} + k + (\frac{1}{2} + f + g + h)^2$

phenotypes of offspring and their numbers from matings: (1) AABB is $x^2y + (x + y + z + w)$; (2) AAbb, aaBB, and aAbB are $y^2 + 2(y + z + x)$.

[illegible][illegible][illegible]

to calculate the numbers of F_4 genotypes, we use these same algebraic expressions and insert F_1 values for each genotype.

FIGURE 1.—General program flow and techniques used to develop computer programs.

Table 1.--Fraction surviving in F_1 and F_3 generations of native population into which insects bearing conditional lethal traits are released in ratio of $\bar{X}:1$ native insects

Inheritance of conditional lethal traits in release strain	Genotypic values of survivors	Generation	Fraction surviving ^{1/}
1 dominant gene----	-----	F_1, F_3	$1 - \frac{\bar{X}^2 + 2\bar{X}}{\bar{X}^2 + 2\bar{X} + 1}$
2 autosomal genes, additive-----	3 or 4	$\left. \begin{matrix} F_1 \\ F_3 \end{matrix} \right\}$	$\frac{4}{4\bar{X}^2 + 8\bar{X} + 4}$
			$\frac{56\bar{X}^6 + 432\bar{X}^5 + 1272\bar{X}^4 + 1808\bar{X}^3 + 1332\bar{X}^2 + 480\bar{X} + 64}{64\bar{X}^8 + 512\bar{X}^7 + 1792\bar{X}^6 + 3584\bar{X}^5 + 4480\bar{X}^4 + 3584\bar{X}^3 + 1792\bar{X}^2 + 512\bar{X} + 64}$
3 autosomal genes, additive-----	$\left. \begin{matrix} 5 \text{ or } 6 \\ 4, 5, \text{ or } 6 \end{matrix} \right\}$	$\left. \begin{matrix} F_1 \\ F_3 \end{matrix} \right\}$	$\frac{16}{16\bar{X}^2 + 32\bar{X} + 16}$
			$\frac{19\bar{X}^6 + 312\bar{X}^5 + 1602\bar{X}^4 + 3560\bar{X}^3 + 3723\bar{X}^2 + 1440\bar{X} + 256}{256\bar{X}^8 + 2048\bar{X}^7 + 7168\bar{X}^6 + 14336\bar{X}^5 + 17920\bar{X}^4 + 14336\bar{X}^3 + 7168\bar{X}^2 + 2048\bar{X} + 256}$
	$\left. \begin{matrix} F_1 \\ F_3 \end{matrix} \right\}$		$\frac{16}{16\bar{X}^2 + 32\bar{X} + 16}$
			$\frac{154\bar{X}^6 + 1680\bar{X}^5 + 5724\bar{X}^4 + 8528\bar{X}^3 + 6090\bar{X}^2 + 1728\bar{X} + 256}{256\bar{X}^8 + 2048\bar{X}^7 + 7168\bar{X}^6 + 14336\bar{X}^5 + 17920\bar{X}^4 + 14336\bar{X}^3 + 7168\bar{X}^2 + 2048\bar{X} + 256}$
1 sex-linked and 3 autosomal genes, additive-----	8 or 9	$\left. \begin{matrix} F_1 \\ F_3 \end{matrix} \right\}$	$\frac{256}{256\bar{X}^2 + 512\bar{X} + 256}$
			$\frac{382\bar{X}^6 + 8832\bar{X}^5 + 55116\bar{X}^4 + 138752\bar{X}^3 + 159438\bar{X}^2 + 82944\bar{X} + 16384}{16384\bar{X}^8 + 131072\bar{X}^7 + 458752\bar{X}^6 + 917504\bar{X}^5 + 1,146,880\bar{X}^4 + 917504\bar{X}^3 + 458752\bar{X}^2 + 131072\bar{X} + 16384}$
	$\left. \begin{matrix} F_1 \\ F_3 \end{matrix} \right\}$		$\frac{48\bar{X} + 32}{32\bar{X}^2 + 64\bar{X} + 32}$
	6, 7, 8, or 9		$\frac{384\bar{X}^7 + 23122\bar{X}^6 + 170112\bar{X}^5 + 425656\bar{X}^4 + 488192\bar{X}^3 + 292962\bar{X}^2 + 97920\bar{X} + 16384}{16384\bar{X}^8 + 131072\bar{X}^7 + 458752\bar{X}^6 + 917504\bar{X}^5 + 1,146,880\bar{X}^4 + 917504\bar{X}^3 + 458752\bar{X}^2 + 131072\bar{X} + 16384}$

^{1/} Frequency of nonlethal genotypes in progeny of native and released insects.

Table 2.--Release ratios required for 98- and 99.9-percent suppression in F_1 and F_3 generations of native population overflooded in parental (overwintered) generation with release strain bearing conditional lethal traits

Inheritance of conditional lethal traits in release strain ^{1/}			Release ratio X required for $\geq$			
			98-percent suppression in--		99.9-percent suppression in--	
Trait 1	Trait 2	Trait 3	F_1	F_3	F_1	F_3
1 dom.auto.	----	----	49	49	1,000	1,000
2 auto.(3,4)	----	----	49	48	1,000	1,000
3 auto.(5,6)	----	----	49	8	1,000	84
3 auto.(4-6)	----	----	49	36	1,000	1,000
3 auto.+ 1 s.l. (8,9)	----	----	49	5	1,000	36
3 auto.+ 1 s.l. (6-9)	----	----	> 1,000	> 1,000	> 1,000	> 1,000
1 dom.auto.	2 auto.(3,4)	----	49	3	1,000	10
1 dom.auto.	3 auto.(5,6)	----	49	2	1,000	6
1 dom.auto.	3 auto.(4-6)	----	49	3	1,000	9
1 dom.auto.	3 auto.+ 1 s.l. (8,9)	----	49	2	1,000	5
1 dom.auto.	1 dom.auto.	----	49	3	1,000	10
1 dom.auto.	3 auto.+ 1 s.l. (6-9)	----	49	4	1,000	11
2 auto.(3,4)	2 auto.(3,4)	----	49	4	1,000	10
2 auto.(3,4)	3 auto.(5,6)	----	49	3	1,000	6
2 auto.(3,4)	3 auto.(4-6)	----	49	4	1,000	9
2 auto.(3,4)	3 auto.+ 1 s.l. (8,9)	----	49	2	1,000	5
2 auto.(3,4)	3 auto.+ 1 s.l. (6-9)	----	49	4	1,000	11
3 auto.(5,6)	3 auto.(5,6)	----	49	2	1,000	4
3 auto.(5,6)	3 auto.(4-6)	----	49	3	1,000	6
3 auto.(5,6)	3 auto.(4-6)	----	49	4	1,000	9
3 auto.(5,6)	3 auto.+ 1 s.l. (8,9)	----	49	2	1,000	3
3 auto.(5,6)	3 auto.+ 1 s.l. (6-9)	----	49	3	1,000	7
3 auto.(4-6)	3 auto.+ 1 s.l. (8,9)	----	49	2	1,000	5
3 auto.(4-6)	3 auto.+ 1 s.l. (6-9)	----	49	4	1,000	11
3 auto.+ 1 s.l. (8,9)	3 auto.+ 1 s.l. (8,9)	----	49	2	1,000	3
3 auto.+ 1 s.l. (8,9)	3 auto.+ 1 s.l. (6-9)	----	49	2	1,000	5
3 auto.+ 1 s.l. (6-9)	3 auto.+ 1 s.l. (6-9)	----	> 1,000	5	> 1,000	14
1 dom.auto.	1 dom.auto.	1 dom.auto.	49	2	1,000	3
1 dom.auto.	1 dom.auto.	3 auto.(5,6)	49	2	1,000	3
1 dom.auto.	2 auto.(3,4)	3 auto.(4-6)	49	2	1,000	4
1 dom.auto.	2 auto.(3,4)	3 auto.+ 1 s.l.(6-9)	49	2	1,000	4
2 auto.(3,4)	2 auto.(3,4)	2 auto.(3,4)	49	2	1,000	4
2 auto.(3,4)	2 auto.(3,4)	3 auto.+ 1 s.l.(8,9)	49	2	1,000	3
2 auto.(3,4)	3 auto.(5,6)	3 auto.(4-6)	49	2	1,000	3
2 auto.(3,4)	3 auto.(5,6)	3 auto.+ 1 s.l.(6-9)	49	2	1,000	3
3 auto.(5,6)	3 auto.(5,6)	3 auto.(5,6)	49	1	1,000	2
3 auto.(5,6)	3 auto.(4-6)	3 auto.(4-6)	49	2	1,000	3
3 auto.(4-6)	3 auto.(4-6)	3 auto.(4-6)	49	2	1,000	4
3 auto.(4-6)	3 auto.+ 1 s.l. (8,9)	3 auto.+ 1 s.l.(8,9)	49	2	1,000	3
3 auto.+ 1 s.l. (8,9)	3 auto.+ 1 s.l. (8,9)	3 auto.+ 1 s.l.(8,9)	49	1	1,000	2
3 auto.+ 1 s.l. (6-9)	3 auto.+ 1 s.l. (6-9)	3 auto.+ 1 s.l.(6-9)	49	2	1,000	5

^{1/} Numbers in parentheses are genotypic values of survivors.

Table 3.--Theoretical population and genotypic trends when native population of 2,000 insects (aa) is overflooded by 198,000 or 396,000 partially sterile insects (AA) during parental, F₁, F₂, and F₃ generations. Matings between partially sterile insects are assumed to yield no offspring

Number released	Sterility	Rate of increase	Generation	Genotype			Total
				aa	Aa	AA	
	<u>Percent</u>						
198,000--	90	Fivefold---	F ₁	100	1,980	-----	2,080
			F ₂	30	1,133	1,005	2,168
			F ₃	9	636	1,615	2,260
			F ₄	3	355	2,005	2,363
198,000--	80	--do--	F ₁	100	3,960	-----	4,060
			F ₂	107	4,280	3,977	8,364
			F ₃	122	4,978	12,646	17,746
			F ₄	158	6,625	33,089	39,872
198,000--	90	Tenfold---	F ₁	200	3,960	-----	4,160
			F ₂	235	4,697	4,072	9,004
			F ₃	322	6,546	14,275	21,143
			F ₄	590	12,255	45,762	58,607
198,000--	80	--do--	F ₁	200	7,920	-----	8,120
			F ₂	840	17,583	15,977	34,400
			F ₃	3,991	53,351	110,806	168,148
			F ₄	25,685	296,629	813,595	1,135,904
396,000--	90	Fivefold---	F ₁	50	1,990	-----	2,040
			F ₂	14	1,066	1,022	2,102
			F ₃	4	565	1,557	2,126
			F ₄	1	298	1,872	2,171
396,000--	80	--do--	F ₁	50	3,980	-----	4,030
			F ₂	52	4,141	3,989	8,182
			F ₃	56	4,477	12,328	16,861
			F ₄	64	5,211	30,514	35,789
396,000--	90	Tenfold	F ₁	101	3,980	-----	4,081
			F ₂	109	4,346	4,038	8,493
			F ₃	129	5,170	13,116	18,415
			F ₄	178	7,242	35,955	43,375
396,000--	80	--do--	F ₁	101	7,960	-----	8,061
			F ₂	412	16,800	15,994	33,206
			F ₃	1,809	42,538	103,891	148,238
			F ₄	9,786	173,314	652,111	835,211

Table 4.--Theoretical population and genotypic trends when native population of 2,000 insects (AABB) is overflooded by 198,000 or 396,000 partially sterile insects (aabb) during parental, F₁, F₂, and F₃ generations. Matings between partially sterile insects are assumed to yield no offspring.

Number released	Sterility Percent	Rate of increase	Generation	Genotype										Total
				AABB	AaBB	AABb	AaBb	aaBB	aaBb	AABb	Aabb	aabb		
198,000--	90	Fivefold--	F ₁	100	----	----	----	1,980	----	----	----	----	----	2,080
			F ₂	9	15	15	616	6	502	6	502	496	2,166	
			F ₃	1	4	4	195	4	438	4	438	1,173	2,260	
			F ₄	0	1	1	61	2	293	2	293	1,709	2,362	
198,000--	80	--do--	F ₁	100	----	----	----	3,960	----	----	----	----	4,060	
			F ₂	29	53	53	2,238	24	1,989	24	1,989	1,964	8,365	
			F ₃	10	50	50	1,498	62	3,431	62	3,431	9,153	17,747	
			F ₄	4	44	44	1,278	110	5,304	110	5,304	27,676	39,873	
198,000--	90	Tenfold---	F ₁	200	----	----	----	3,960	----	----	----	----	4,160	
			F ₂	70	117	117	2,545	48	2,036	48	2,036	1,988	9,005	
			F ₃	33	140	140	2,244	150	4,162	150	4,162	9,964	21,144	
			F ₄	25	192	192	3,054	374	9,007	374	9,007	36,382	58,607	
198,000--	80	--do--	F ₁	200	----	----	----	7,920	----	----	----	----	8,120	
			F ₂	231	419	419	9,176	190	7,988	190	7,988	7,798	34,399	
			F ₃	373	1694	1694	18,459	1,925	33,197	1,915	33,197	75,684	168,148	
			F ₄	1219	8754	8754	87,299	15,712	200,575	15,712	200,575	597,305	1,135,905	
396,000--	90	Fivefold--	F ₁	50	----	----	----	1,990	----	----	----	----	2,040	
			F ₂	4	7	7	558	3	501	3	501	498	2,082	
			F ₃	0	1	1	158	2	406	2	406	1,149	2,126	
			F ₄	0	0	0	44	1	254	1	254	1,618	2,171	
396,000--	80	--do--	F ₁	50	----	----	----	3,980	----	----	----	----	4,030	
			F ₂	14	26	26	2,120	12	1,995	12	1,995	1,982	8,182	
			F ₃	4	22	22	1,239	30	3,216	30	3,216	9,083	16,861	
			F ₄	1	16	16	840	46	4,355	46	4,355	26,112	35,788	
396,000--	90	Tenfold---	F ₁	100	----	----	----	3,980	----	----	----	----	4,081	
			F ₂	30	54	54	2,273	25	2,019	25	2,019	1,994	8,494	
			F ₃	11	53	53	1,557	66	3,560	66	3,560	9,490	18,414	
			F ₄	5	49	49	1,405	123	5,788	123	5,788	30,043	43,375	
396,000--	80	--do--	F ₁	100	----	----	----	7,960	----	----	----	----	8,061	
			F ₂	108	206	206	8,597	98	7,997	98	7,997	7,899	33,206	
			F ₃	141	719	719	13,040	939	28,768	939	28,768	74,183	148,237	
			F ₄	313	2876	2876	41,335	6,597	129,103	6,596	129,103	516,410	835,209	

Table 5.--Theoretical population and genotypic trends when native population of 2,000 insects (AABDD) is overflooded by 198,000 or 396,000 partially sterile insects (aabbdd) during parental, F₁, F₂, and F₃ generations. Matings between partially sterile insects are assumed to yield no offspring

198,000 released with indicated sterility, increase, and generation																	
Genotype	90 percent, fivefold				80 percent, fivefold				90 percent, tenfold				80 percent, tenfold				
	F ₁	F ₂	F ₃	F ₄	F ₁	F ₂	F ₃	F ₄	F ₁	F ₂	F ₃	F ₄	F ₁	F ₂	F ₃	F ₄	
AABBDD----	100	3	0	0	0	100	9	1	0	200	24	4	2	200	69	45	81
AABBDd----	----	4	0	0	0	----	15	4	1	----	34	15	9	----	114	169	467
AABbDD----	----	4	0	0	0	----	15	4	1	----	34	15	9	----	114	169	467
AaBbDD----	----	4	0	0	0	----	15	4	1	----	34	15	9	----	114	169	467
AABDDd----	----	2	0	0	0	----	6	5	3	----	12	13	14	----	48	159	671
AABbDD----	----	2	0	0	0	----	6	5	3	----	12	13	14	----	48	159	671
aABDDd----	----	2	0	0	0	----	6	5	3	----	12	13	14	----	48	159	671
AABbDd----	----	7	2	0	0	----	27	21	13	----	58	62	66	----	209	736	3,135
AaBbDd----	----	7	2	0	0	----	27	21	13	----	58	62	66	----	209	736	3,135
AaBbDD----	----	7	2	0	0	----	27	21	13	----	58	62	66	----	209	736	3,135
AABbDd----	----	3	2	0	0	----	12	25	30	----	24	62	116	----	95	789	5,151
AABbDd----	----	3	2	0	0	----	12	25	30	----	24	62	116	----	95	789	5,151
AaBbDd----	----	3	2	0	0	----	12	25	30	----	24	62	116	----	95	789	5,151
AaBbDd----	----	3	2	0	0	----	12	25	30	----	24	62	116	----	95	789	5,151
aABbDd----	----	3	2	0	0	----	12	25	30	----	24	62	116	----	95	789	5,151
AaBbDd----	1,980	357	67	12	3,960	1,217	496	289	289	3,960	1,468	865	884	7,920	4,972	7,006	28,092
AABbDd----	----	2	2	1	1	----	6	33	77	----	12	74	244	----	48	976	9,890
aABbDd----	----	2	2	1	1	----	6	33	77	----	12	74	244	----	48	976	9,890
aABbDd----	----	2	2	1	1	----	6	33	77	----	12	74	244	----	48	976	9,890
AaBbDd----	----	251	126	48	48	----	994	981	976	----	1,018	1,316	211	----	3,994	10,717	56,072
AaBbDd----	----	251	126	48	48	----	994	981	976	----	1,018	1,316	211	----	3,994	10,717	56,072
aABbDd----	----	251	126	48	48	----	994	981	976	----	1,018	1,316	211	----	3,994	10,717	56,072
AaBbDd----	----	248	310	245	245	----	982	2,425	4,298	----	994	2,783	6,784	----	3,899	21,692	139,353
aABbDd----	----	248	310	245	245	----	982	2,425	4,298	----	994	2,783	6,784	----	3,899	21,692	139,353
aABbDd----	----	248	310	245	245	----	982	2,425	4,298	----	994	2,783	6,784	----	3,899	21,692	139,353
aABbDd----	----	246	860	1,463	1,463	----	976	6,695	23,300	----	982	7,107	29,355	----	3,851	53,062	448,066
Total----	2,080	2,166	2,260	2,362	4,060	8,365	17,747	39,873	4,160	9,005	21,144	58,607	8,120	34,399	168,148	1,135,912	

Table 5.-- Theoretical population and genotypic trends when native population of 2,000 insects (AABDD) is overflooded by 198,000 or 396,000 partially sterile insects (aabbdd) during parental, F₁, F₂, and F₃ generations. Matings between partially sterile insects are assumed to yield no offspring--Continued

Genotype	396,000 released with indicated sterility, increase, and generation											
	90 percent, fivefold				80 percent, fivefold				90 percent, tenfold			
	F ₁	F ₂	F ₃	F ₄	F ₁	F ₂	F ₃	F ₄	F ₁	F ₂	F ₃	F ₄
AABDD----	50	1	0	0	0	4	0	0	101	9	1	0
AABDDd----	----	2	0	0	0	7	2	0	----	15	5	2
AABbDD----	----	2	0	0	0	7	2	0	----	15	5	2
AaBBDD----	----	2	0	0	0	7	2	0	----	15	5	2
AABbDd----	----	1	0	0	0	3	2	1	----	6	5	3
AABbDd----	----	1	0	0	0	3	2	1	----	6	5	3
aabbDD----	----	1	0	0	0	3	2	1	----	6	5	3
AABbDd----	----	3	1	0	0	13	9	4	----	27	22	15
AaBBDD----	----	3	1	0	0	13	9	4	----	27	22	15
AaBBDD----	----	3	1	0	0	13	9	4	----	27	22	15
AABbDd----	----	2	1	0	0	6	12	11	----	12	26	33
AABbDd----	----	2	1	0	0	6	12	11	----	12	26	33
AaBBDD----	----	2	1	0	0	6	12	11	----	12	26	33
AaBBDD----	----	2	1	0	0	6	12	11	----	12	26	33
aabbDD----	----	2	1	0	0	6	12	11	----	12	26	33
AaBBDD----	----	2	1	0	0	6	12	11	----	12	26	33
AaBBDD----	1,990	304	48	7	3,980	1,110	366	155	3,980	1,236	517	319
AABbDd----	----	1	1	1	1	3	16	34	----	6	35	87
AABbDd----	----	1	1	1	1	3	16	34	----	6	35	87
aabbDD----	----	1	1	1	1	3	16	34	----	6	35	87
AaBbDd----	251	109	109	37	997	864	864	681	----	1,010	1,018	1,071
AaBbDd----	251	109	109	37	997	864	864	681	----	1,010	1,018	1,071
AaBbDd----	251	109	109	37	997	864	864	681	----	1,010	1,018	1,071
AaBbDd----	249	296	296	217	991	2,340	3,663	3,663	----	997	2,516	4,684
AaBbDd----	249	296	296	217	991	2,340	3,663	3,663	----	997	2,516	4,684
AaBbDd----	249	296	296	217	991	2,340	3,663	3,663	----	997	2,516	4,684
AaBbDd----	248	852	852	1,400	988	6,727	22,415	22,415	----	991	6,940	25,272
Total----	2,040	2,082	2,126	2,171	4,030	8,182	16,861	35,788	4,081	8,494	18,414	43,375
									8,061	33,206	148,237	835,209

Table 6.--Theoretical population and genotypic trends when native population of 2,000 insects (AABB00EE) is overflooded by 198,000 or 396,000 partially sterile insects (aabbddEE) during parental, F₁, F₂, and F₃ generations. Matings between partially sterile insects are assumed to yield no offspring

Genotype	198,000 released with indicated sterility, increase, and generation															
	90 percent, fivefold				80 percent, tenfold				90 percent, tenfold				80 percent, tenfold			
	F ₁	F ₂	F ₃	F ₄	F ₁	F ₂	F ₃	F ₄	F ₁	F ₂	F ₃	F ₄	F ₁	F ₂	F ₃	F ₄
AABB00EE---100	1	0	0	0	100	3	0	0	200	10	1	0	200	23	7	7
AABbDDEE---	1	0	0	0	2	0	0	0	11	2	1	0	33	21	34	34
AaBbDDEE---	1	0	0	0	4	0	0	0	11	2	1	0	33	21	34	34
AabbDDEE---	1	0	0	0	4	0	0	0	11	2	1	0	33	21	34	34
AABbDDee---	0	0	0	0	2	0	0	0	3	1	1	0	12	16	40	40
AABbDdEe---	0	0	0	0	2	0	0	0	3	1	1	0	12	16	40	40
AaBbDDee---	0	0	0	0	2	0	0	0	3	1	1	0	12	16	40	40
AaBbDdEe---	0	0	0	0	2	0	0	0	3	1	1	0	12	16	40	40
AABbDDee---	2	0	0	0	7	2	0	0	17	7	4	0	57	78	185	185
AABbDdEe---	2	0	0	0	7	2	0	0	17	7	4	0	57	78	185	185
AaBbDDee---	2	0	0	0	7	2	0	0	17	7	4	0	57	78	185	185
AaBbDdEe---	2	0	0	0	7	2	0	0	17	7	4	0	57	78	185	185
AABbDDee---	2	0	0	0	7	2	0	0	17	7	4	0	57	78	185	185
AABbDdEe---	2	0	0	0	7	2	0	0	17	7	4	0	57	78	185	185
AaBbDDee---	1	0	0	0	3	2	1	0	6	6	5	0	24	69	25	25
AaBbDdEe---	1	0	0	0	3	2	1	0	6	6	5	0	24	69	25	25
AaBbDDee---	1	0	0	0	3	2	1	0	6	6	5	0	24	69	25	25
AaBbDdEe---	1	0	0	0	3	2	1	0	6	6	5	0	24	69	25	25
AaBbDDee---	1	0	0	0	3	2	1	0	6	6	5	0	24	69	25	25
AaBbDdEe---	1	0	0	0	3	2	1	0	6	6	5	0	24	69	25	25
AaBbDDee---	1	0	0	0	3	2	1	0	6	6	5	0	24	69	25	25
AaBbDdEe---	1	0	0	0	3	2	1	0	6	6	5	0	24	69	25	25
AaBbDDee---	1	0	0	0	3	2	1	0	6	6	5	0	24	69	25	25
AaBbDdEe---	1	0	0	0	3	2	1	0	6	6	5	0	24	69	25	25
AaBbDDee---	4	1	0	0	13	9	4	0	29	29	24	0	105	328	1,172	1,172
AaBbDdEe---	4	1	0	0	13	9	4	0	29	29	24	0	105	328	1,172	1,172
AaBbDDee---	4	1	0	0	13	9	4	0	29	29	24	0	105	328	1,172	1,172
AaBbDdEe---	4	1	0	0	13	9	4	0	29	29	24	0	105	328	1,172	1,172
AaBbDDee---	0	0	0	0	2	2	2	0	3	6	8	0	12	74	383	383
AaBbDdEe---	0	0	0	0	2	2	2	0	3	6	8	0	12	74	383	383
AaBbDDee---	0	0	0	0	2	2	2	0	3	6	8	0	12	74	383	383
AaBbDdEe---	0	0	0	0	2	2	2	0	3	6	8	0	12	74	383	383
AaBbDDee---	0	0	0	0	2	2	2	0	3	6	8	0	12	74	383	383
AaBbDdEe---	0	0	0	0	2	2	2	0	3	6	8	0	12	74	383	383
AaBbDDee---	2	1	0	0	6	10	8	0	12	27	38	0	48	330	1,778	1,778
AaBbDdEe---	2	1	0	0	6	10	8	0	12	27	38	0	48	330	1,778	1,778
AaBbDDee---	2	1	0	0	6	10	8	0	12	27	38	0	48	330	1,778	1,778
AaBbDdEe---	2	1	0	0	6	10	8	0	12	27	38	0	48	330	1,778	1,778
AaBbDDee---	2	1	0	0	6	10	8	0	12	27	38	0	48	330	1,778	1,778
AaBbDdEe---	2	1	0	0	6	10	8	0	12	27	38	0	48	330	1,778	1,778
AaBbDDee---	2	1	0	0	6	10	8	0	12	27	38	0	48	330	1,778	1,778
AaBbDdEe---	2	1	0	0	6	10	8	0	12	27	38	0	48	330	1,778	1,778
AaBbDDee---	2	1	0	0	6	10	8	0	12	27	38	0	48	330	1,778	1,778
AaBbDdEe---	2	1	0	0	6	10	8	0	12	27	38	0	48	330	1,778	1,778
AaBbDDee---	2	1	0	0	6	10	8	0	12	27	38	0	48	330	1,778	1,778
AaBbDdEe---	2	1	0	0	6	10	8	0	12	27	38	0	48	330	1,778	1,778
AaBbDDee---	1	1	0	0	3	13	20	0	6	30	73	0	24	390	3,125	3,125
AaBbDdEe---	1	1	0	0	3	13	20	0	6	30	73	0	24	390	3,125	3,125
AaBbDDee---	1	1	0	0	3	13	20	0	6	30	73	0	24	390	3,125	3,125
AaBbDdEe---	1	1	0	0	3	13	20	0	6	30	73	0	24	390	3,125	3,125
AaBbDDee---	1	1	0	0	3	13	20	0	6	30	73	0	24	390	3,125	3,125
AaBbDdEe---	1	1	0	0	3	13	20	0	6	30	73	0	24	390	3,125	3,125
AaBbDDee---	1	1	0	0	3	13	20	0	6	30	73	0	24	390	3,125	3,125
AaBbDdEe---	1	1	0	0	3	13	20	0	6	30	73	0	24	390	3,125	3,125
AaBbDDee---	1	1	0	0	3	13	20	0	6	30	73	0	24	390	3,125	3,125
AaBbDdEe---	1	1	0	0	3	13	20	0	6	30	73	0	24	390	3,125	3,125
AaBbDDee---	1	1	0	0	3	13	20	0	6	30	73	0	24	390	3,125	3,125
AaBbDdEe---	1	1	0	0	3	13	20	0	6	30	73	0	24	390	3,125	3,125
AaBbDDee---	1	1	0	0	3	13	20	0	6	30	73	0	24	390	3,125	3,125
AaBbDdEe---	1	1	0	0	3	13	20	0	6	30	73	0	24	390	3,125	3,125
AaBbDDee---	1	1	0	0	3	13	20	0	6	30	73	0	24	390	3,125	3,125
AaBbDdEe---	1	1	0	0	3	13	20	0	6	30	73	0	24	390	3,125	3,125
AaBbDDee---	126	40	9	0	497	303	210	0	509	461	574	0	1,997	3,771	17,244	17,244
AaBbDdEe---	126	40	9	0	497	303	210	0	509	461	574	0	1,997	3,771	17,244	17,244
AaBbDDee---	126	40	9	0	497	303	210	0	509	461	574	0	1,997	3,771	17,244	17,244
AaBbDdEe---	126	40	9	0	497	303	210	0	509	461	574	0	1,997	3,771	17,244	17,244
AaBbDDee---	124	86	39	0	491	668	758	0	497	829	1,495	0	1,950	6,616	37,050	37,050
AaBbDdEe---	124	86	39	0	491	668	758	0	497	829	1,495	0	1,950	6,616	37,050	37,050
AaBbDDee---	124	86	39	0	491	668	758	0	497	829	1,495	0	1,950	6,616	37,050	37,050
AaBbDdEe---	124	86	39	0	491	668	758	0	497	829	1,495	0	1,950	6,616	37,050	37,050
AaBbDDee---	123	224	206	0	488	1,744	3,520	0	491	1,924	5,216	0	1,926	14,686	99,178	99,178
AaBbDdEe---	123	224	206	0	488	1,744	3,520	0	491	1,924	5,216	0	1,926	14,686	99,178	99,178
AaBbDDee---	123	224	206	0	488	1,744	3,520	0	491	1,924	5,216	0	1,926	14,686	99,178	99,178
AaBbDdEe---	123	224	206	0	488	1,744	3,520	0	491	1,924	5,216	0	1,926	14,686	99,178	99,178
AaBbDDee---	123	635	1,257	0	487	4,933	19,725	0	488	5,144	23,976	0	1,914	37,818	342,503	342,503
Total----	2,080	2,166	2,260	2,362	4,060	8,365	17,747	39,873	4,160	9,005	21,143	58,606	8,120	34,399	168,147	1,135,904

396,000 released with indicated sterility, increase, and generation																
Genotype	90 percent, fivefold				80 percent, fivefold				90 percent, tenfold				80 percent, tenfold			
	F ₁	F ₂	F ₃	F ₄	F ₁	F ₂	F ₃	F ₄	F ₁	F ₂	F ₃	F ₄	F ₁	F ₂	F ₃	F ₄
AABBDDEE---	50	0	0	0	50	1	0	0	101	3	0	0	101	9	2	1
AABBDDEE---	----	1	0	0	----	2	0	0	----	4	0	0	----	15	6	5
AABBDdEE---	----	1	0	0	----	2	0	0	----	4	0	0	----	15	6	5
AABbdDEE---	----	1	0	0	----	2	0	0	----	4	0	0	----	15	6	5
AaBBDDEE---	----	1	0	0	----	2	0	0	----	4	0	0	----	15	6	5
AABBDDee---	----	0	0	0	----	1	0	0	----	2	0	0	----	6	6	8
AABbddee---	----	0	0	0	----	1	0	0	----	2	0	0	----	6	6	8
AAbBDDEE---	----	0	0	0	----	1	0	0	----	2	0	0	----	6	6	8
aaBBDDEE---	----	0	0	0	----	1	0	0	----	2	0	0	----	6	6	8
AABBDDee---	----	1	0	0	----	3	1	0	----	7	2	1	----	27	26	36
AABbdDee---	----	1	0	0	----	3	1	0	----	7	2	1	----	27	26	36
AABbdDeE---	----	1	0	0	----	3	1	0	----	7	2	1	----	27	26	36
AaBBDDee---	----	1	0	0	----	3	1	0	----	7	2	1	----	27	26	36
AaBBDdEe---	----	1	0	0	----	3	1	0	----	7	2	1	----	27	26	36
AaBbDDEE---	----	1	0	0	----	3	1	0	----	7	2	1	----	27	26	36
AABBDdee---	----	0	0	0	----	2	1	0	----	3	2	1	----	12	28	63
AABbddee---	----	0	0	0	----	2	1	0	----	3	2	1	----	12	28	63
AABbdDee---	----	0	0	0	----	2	1	0	----	3	2	1	----	12	28	63
AABbdDeE---	----	0	0	0	----	2	1	0	----	3	2	1	----	12	28	63
AaBbdDee---	----	0	0	0	----	2	1	0	----	3	2	1	----	12	28	63
AaBbdDeE---	----	0	0	0	----	2	1	0	----	3	2	1	----	12	28	63
AaBbdDEE---	----	0	0	0	----	2	1	0	----	3	2	1	----	12	28	63
aaBBDDee---	----	0	0	0	----	2	1	0	----	3	2	1	----	12	28	63
aaBBDdEe---	----	0	0	0	----	2	1	0	----	3	2	1	----	12	28	63
aaBbDDEE---	----	0	0	0	----	2	1	0	----	3	2	1	----	12	28	63
AABBDdEe---	----	2	0	0	----	6	4	1	----	14	9	5	----	51	125	291
AaBBDdEe---	----	2	0	0	----	6	4	1	----	14	9	5	----	51	125	291
AaBbDDEE---	----	2	0	0	----	6	4	1	----	14	9	5	----	51	125	291
AaBbDdEe---	----	2	0	0	----	6	4	1	----	14	9	5	----	51	125	291
AABbddee---	----	0	0	0	----	1	1	1	----	2	2	2	----	6	35	125
AABbdDee---	----	0	0	0	----	1	1	1	----	2	2	2	----	6	35	125
AABbdDeE---	----	0	0	0	----	1	1	1	----	2	2	2	----	6	35	125
aabBDDee---	----	0	0	0	----	1	1	1	----	2	2	2	----	6	35	125
aabBdDEE---	----	0	0	0	----	1	1	1	----	2	2	2	----	6	35	125
aabbDDEE---	----	0	0	0	----	1	1	1	----	2	2	2	----	6	35	125
AABbDdee---	----	1	0	0	----	3	5	3	----	6	11	9	----	25	148	565
AABbddee---	----	1	0	0	----	3	5	3	----	6	11	9	----	25	148	565
AABbdDee---	----	1	0	0	----	3	5	3	----	6	11	9	----	25	148	565
AaBBDDee---	----	1	0	0	----	3	5	3	----	6	11	9	----	25	148	565
AaBbdDee---	----	1	0	0	----	3	5	3	----	6	11	9	----	25	148	565
AaBbdDeE---	----	1	0	0	----	3	5	3	----	6	11	9	----	25	148	565
AaBbddee---	----	1	0	0	----	3	5	3	----	6	11	9	----	25	148	565
AaBbdDeE---	----	1	0	0	----	3	5	3	----	6	11	9	----	25	148	565
AaBbdDeE---	----	1	0	0	----	3	5	3	----	6	11	9	----	25	148	565
AaBbdDEE---	----	1	0	0	----	3	5	3	----	6	11	9	----	25	148	565
AaBbdDEE---	----	1	0	0	----	3	5	3	----	6	11	9	----	25	148	565
AaBbdDEE---	----	1	0	0	----	3	5	3	----	6	11	9	----	25	148	565
AaBbdDEE---	----	1	0	0	----	3	5	3	----	6	11	9	----	25	148	565
AaBbdDEE---	----	1	0	0	----	3	5	3	----	6	11	9	----	25	148	565
AaBbdDEE---	----	1	0	0	----	3	5	3	----	6	11	9	----	25	148	565
AaBbdDEE---	----	1	0	0	----	3	5	3	----	6	11	9	----	25	148	565
AaBbdDEE---	----	1	0	0	----	3	5	3	----	6	11	9	----	25	148	565
AaBbdDEE---	----	1	0	0	----	3	5	3	----	6	11	9	----	25	148	565
AaBbdDEE---	----	1	0	0	----	3	5	3	----	6	11	9	----	25	148	565
AaBbdDEE---	----	1	0	0	----	3	5	3	----	6	11	9	----	25	148	565
AaBbdDEE---	----	1	0	0	----	3	5	3	----	6	11	9	----	25	148	565
AaBbdDEE---	----	1	0	0	----	3	5	3	----	6	11	9	----	25	148	565
AaBbdDEE---	----	1	0	0	----	3	5	3	----	6	11	9	----	25	148	565
AaBbdDEE---	----	1	0	0	----	3	5	3	----	6	11	9	----	25	148	565
AaBbdDEE---	----	1	0	0	----	3	5	3	----	6	11	9	----	25	148	565
AaBbdDEE---	----	1	0	0	----	3	5	3	----	6	11	9	----	25	148	565
AaBbdDEE---	----	1	0	0	----	3	5	3	----	6	11	9	----	25	148	565
AaBbdDEE---	----	1	0	0	----	3	5	3	----	6	11	9	----	25	148	565
AaBbdDEE---	----	1	0	0	----	3	5	3	----	6	11	9	----	25	148	565
AaBbdDEE---	----	1	0	0	----	3	5	3	----	6	11	9	----	25	148	565
AaBbdDEE---	----	1	0	0	----	3	5	3	----	6	11	9	----	25	148	565
AaBbdDEE---	----	1	0	0	----	3	5	3	----	6	11	9	----	25	148	565
AaBbdDEE---	----	1	0	0	----	3	5	3	----	6	11	9	----	25	148	565
AaBbdDEE---	----	1	0	0	----	3	5	3	----	6	11	9	----	25	148	565
AaBbdDEE---	----	1	0	0	----	3	5	3	----	6	11	9	----	25	148	565
AaBbdDEE---	----	1	0	0	----	3	5	3	----	6	11	9	----	25	148	565
AaBbdDEE---	----	1	0	0	----	3	5	3	----	6	11	9	----	25	148	565
AaBbdDEE---	----	1	0	0	----	3	5	3	----	6	11	9	----	25	148	565
AaBbdDEE---	----	1	0	0	----	3	5	3	----	6	11	9	----	25	148	565
AaBbdDEE---	----	1	0	0	----	3	5	3	----	6	11	9	----	25	148	565
AaBbdDEE---	----	1	0	0	----	3	5	3	----	6	11	9	----	25	148	565
AaBbdDEE---	----	1	0	0	----	3	5	3	----	6	11	9	----	25	148	565
AaBbdDEE---	----															

Table 1.--Theoretical population and genotypic trends of male insects when native population of 2,000 insects (3 autosomal genes B8DDEe plus 1 sex-linked gene AA; female is heterogametic) is overflooded by 198,000 or 396,000 partially sterile insects (aabbdddee and a-bbddee) during parental, F₁, F₂, and F₃ generations. Matings between partially sterile insects are assumed to yield no offspring

198,000 released with indicated sterility, increase, and generation																
Genotype	90 percent, fivefold				80 percent, fivefold				90 percent, tenfold				80 percent, tenfold			
	F ₁	F ₂	F ₃	F ₄	F ₁	F ₂	F ₃	F ₄	F ₁	F ₂	F ₃	F ₄	F ₁	F ₂	F ₃	F ₄
AA3BDDDEe ---	50	1	0	0	50	1	0	0	100	5	0	0	100	12	4	4
AA3BDDDee ---	---	1	0	0	---	2	0	0	---	5	1	0	---	17	11	17
AA3BddDEe ---	---	1	0	0	---	2	0	0	---	5	1	0	---	17	11	17
AA3BddDee ---	---	1	0	0	---	2	0	0	---	5	1	0	---	17	11	17
Aa3BDDDEe ---	---	1	0	0	---	2	0	0	---	5	1	0	---	17	11	17
Aa3BDDDee ---	---	1	0	0	---	2	0	0	---	5	1	0	---	17	11	17
Aa3BddDEe ---	---	0	0	0	---	1	0	0	---	2	1	0	---	6	8	20
Aa3BddDee ---	---	0	0	0	---	1	0	0	---	2	1	0	---	6	8	20
aa3BDDDEe ---	---	0	0	0	---	1	0	0	---	2	1	0	---	6	8	20
aa3BDDDee ---	---	0	0	0	---	1	0	0	---	2	1	0	---	6	8	20
AA3BDDDee ---	---	1	0	0	---	4	1	0	---	9	4	2	---	29	39	92
AA3BddDEe ---	---	1	0	0	---	4	1	0	---	9	4	2	---	29	39	92
AA3BddDee ---	---	1	0	0	---	4	1	0	---	9	4	2	---	29	39	92
Aa3BDDDee ---	---	1	0	0	---	4	1	0	---	9	4	2	---	29	39	92
Aa3BddDEe ---	---	1	0	0	---	4	1	0	---	9	4	2	---	29	39	92
Aa3BddDee ---	---	1	0	0	---	4	1	0	---	9	4	2	---	29	39	92
aa3BDDDee ---	---	0	0	0	---	2	1	0	---	3	3	2	---	12	35	123
aa3BddDEe ---	---	0	0	0	---	2	1	0	---	3	3	2	---	12	35	123
aa3BddDee ---	---	0	0	0	---	2	1	0	---	3	3	2	---	12	35	123
Aa3BddDEe ---	---	0	0	0	---	2	1	0	---	3	3	2	---	12	35	123
Aa3BddDee ---	---	0	0	0	---	2	1	0	---	3	3	2	---	12	35	123
aa3BddDEe ---	---	0	0	0	---	2	1	0	---	3	3	2	---	12	35	123
aa3BddDee ---	---	0	0	0	---	2	1	0	---	3	3	2	---	12	35	123
aa3BDDDee ---	---	0	0	0	---	2	1	0	---	3	3	2	---	12	35	123
aa3BDDDee ---	---	0	0	0	---	2	1	0	---	3	3	2	---	12	35	123
AA3BDDDee ---	---	2	0	0	---	7	4	2	---	15	14	12	---	52	164	581
Aa3BDDDee ---	---	2	0	0	---	7	4	2	---	15	14	12	---	52	164	581
Aa3BddDEe ---	---	2	0	0	---	7	4	2	---	15	14	12	---	52	164	581
Aa3BddDee ---	---	2	0	0	---	7	4	2	---	15	14	12	---	52	164	581
AA3BddDee ---	---	0	0	0	---	1	1	1	---	2	3	4	---	6	37	190
AA3BddDee ---	---	0	0	0	---	1	1	1	---	2	3	4	---	6	37	190
Aa3BddDEe ---	---	0	0	0	---	1	1	1	---	2	3	4	---	6	37	190
Aa3BddDee ---	---	0	0	0	---	1	1	1	---	2	3	4	---	6	37	190
aa3BddDEe ---	---	0	0	0	---	1	1	1	---	2	3	4	---	6	37	190
aa3BddDee ---	---	0	0	0	---	1	1	1	---	2	3	4	---	6	37	190
AA3BDDDee ---	---	1	0	0	---	3	5	4	---	6	13	19	---	24	165	881
AA3BddDEe ---	---	1	0	0	---	3	5	4	---	6	13	19	---	24	165	881
AA3BddDee ---	---	1	0	0	---	3	5	4	---	6	13	19	---	24	165	881
Aa3BDDDee ---	---	1	0	0	---	3	5	4	---	6	13	19	---	24	165	881
Aa3BddDEe ---	---	1	0	0	---	3	5	4	---	6	13	19	---	24	165	881
Aa3BddDee ---	---	1	0	0	---	3	5	4	---	6	13	19	---	24	165	881
aa3BDDDee ---	---	1	0	0	---	3	5	4	---	6	13	19	---	24	165	881
aa3BddDEe ---	---	1	0	0	---	3	5	4	---	6	13	19	---	24	165	881
aa3BddDee ---	---	1	0	0	---	3	5	4	---	6	13	19	---	24	165	881
AA3BddDee ---	---	0	0	0	---	2	6	10	---	3	15	36	---	12	195	1,549
AA3BddDee ---	---	0	0	0	---	2	6	10	---	3	15	36	---	12	195	1,549
Aa3BddDEe ---	---	0	0	0	---	2	6	10	---	3	15	36	---	12	195	1,549
Aa3BddDee ---	---	0	0	0	---	2	6	10	---	3	15	36	---	12	195	1,549
aa3BddDEe ---	---	0	0	0	---	2	6	10	---	3	15	36	---	12	195	1,549
aa3BddDee ---	---	0	0	0	---	2	6	10	---	3	15	36	---	12	195	1,549
aa3BDDDee ---	---	0	0	0	---	2	6	10	---	3	15	36	---	12	195	1,549
aa3BDDDee ---	---	0	0	0	---	2	6	10	---	3	15	36	---	12	195	1,549
AA3BDDDee ---	990	114	13	2	1,980	353	92	38	1,980	465	188	144	3,960	1,435	1,453	4,839
AA3BddDee ---	---	0	1	0	---	1	9	28	---	2	19	81	---	6	256	3,163
AA3BddDee ---	---	0	1	0	---	1	9	28	---	2	19	81	---	6	256	3,163
Aa3BDDDee ---	---	0	1	0	---	1	9	28	---	2	19	81	---	6	256	3,163
Aa3BddDEe ---	---	0	1	0	---	1	9	28	---	2	19	81	---	6	256	3,163
Aa3BddDee ---	---	63	20	5	---	249	151	105	---	254	231	289	---	999	1,886	8,652
Aa3BddDee ---	---	63	20	5	---	249	151	105	---	254	231	289	---	999	1,886	8,652
Aa3BddDee ---	---	63	20	5	---	249	151	105	---	254	231	289	---	999	1,886	8,652
Aa3BddDee ---	---	63	20	5	---	249	151	105	---	254	231	289	---	999	1,886	8,652
AA3BddDee ---	---	62	43	19	---	246	334	381	---	248	414	755	---	975	3,308	18,691
AA3BddDee ---	---	62	43	19	---	246	334	381	---	248	414	755	---	975	3,308	18,691
Aa3BddDEe ---	---	62	43	19	---	246	334	381	---	248	414	755	---	975	3,308	18,691
Aa3BddDee ---	---	62	43	19	---	246	334	381	---	248	414	755	---	975	3,308	18,691
Aa3BddDee ---	---	62	43	19	---	246	334	381	---	248	414	755	---	975	3,308	18,691
Aa3BddDee ---	---	62	43	19	---	246	334	381	---	248	414	755	---	975	3,308	18,691
aa3BddDee ---	---	62	112	103	---	244	872	1,773	---	245	962	2,643	---	963	7,343	50,499
aa3BddDee ---	---	62	112	103	---	244	872	1,773	---	245	962	2,643	---	963	7,343	50,499
aa3BddDee ---	---	62	112	103	---	244	872	1,773	---	245	962	2,643	---	963	7,343	50,499
aa3BddDee ---	---	62	112	103	---	244	872	1,773	---	245	962	2,643	---	963	7,343	50,499
aa3BddDee ---	---	61	348	832	---	243	2,700	12,847	---	244	281	15,140	---	957	20,540	202,385
Total	1,040	1,083	1,160	1,386	2,030	4,182	9,107	22,987	2,080	4,502	10,805	32,644	4,060	17,200	85,703	603,420

Table 7.--Theoretical population and genotypic trends of male insects when native population of 2,000 insects (3 autosomal genes B8DDEE plus 1 sex-linked gene Aa; female is heterogametic) is overflooded by 198,000 or 396,000 partially sterile insects (aabbdee and a-bbdee) during parental, F₁, F₂, and F₃ generations. Matings between partially sterile insects are assumed to yield no offspring--continued

396,000 released with indicated sterility, increase, and generation																
Genotype	90 percent, fivefold				8D percent, fivefold				90 percent, tenfold				80 percent, tenfold			
	F ₁	F ₂	F ₃	F ₄	F ₁	F ₂	F ₃	F ₄	F ₁	F ₂	F ₃	F ₄	F ₁	F ₂	F ₃	F ₄
AABBDDEE---	25	0	0	0	25	1	0	0	50	2	0	0	50	4	1	0
AABBDDEe---	----	0	0	0	----	1	0	0	----	2	0	0	----	7	3	3
AABBDDEEe---	----	0	0	0	----	1	0	0	----	2	0	0	----	7	3	3
AABBDDEE---	----	0	0	0	----	1	0	0	----	2	0	0	----	7	3	3
AaBBDDEE---	----	0	0	0	----	1	0	0	----	2	0	0	----	7	3	3
AABBDDee---	----	0	0	0	----	0	0	0	----	1	0	0	----	3	3	4
AABBDdEe---	----	0	0	0	----	0	0	0	----	1	0	0	----	3	3	4
AabbDDEE---	----	0	0	0	----	0	0	0	----	1	0	0	----	3	3	4
aaBBDDEE---	----	0	D	0	----	0	0	0	----	1	0	0	----	3	3	4
AABBDdEe---	----	0	0	0	----	2	0	0	----	4	1	0	----	13	13	18
AABbDDEE---	----	0	0	0	----	2	0	0	----	4	1	0	----	13	13	18
AABbDdEE---	----	0	0	0	----	2	0	0	----	4	1	0	----	13	13	18
AaBBDDEe---	----	0	0	0	----	2	0	0	----	4	1	0	----	13	13	18
AaBBDdEe---	----	0	0	0	----	2	0	0	----	4	1	0	----	13	13	18
AaBbDDEE---	----	0	0	0	----	2	0	0	----	4	1	0	----	13	13	18
AABBDDee---	----	0	0	0	----	1	0	0	----	2	1	0	----	6	14	31
AABBDdEe---	----	0	0	0	----	1	0	0	----	2	1	0	----	6	14	31
AABbDDEe---	----	0	0	0	----	1	0	0	----	2	1	0	----	6	14	31
AABbDdEe---	----	0	0	0	----	1	0	0	----	2	1	0	----	6	14	31
AaBBDDEe---	----	0	0	0	----	1	0	0	----	2	1	0	----	6	14	31
AaBBDdEe---	----	0	0	0	----	1	0	0	----	2	1	0	----	6	14	31
aaBBDDEe---	----	0	0	0	----	1	0	0	----	2	1	0	----	6	14	31
aaBBDdEe---	----	0	0	0	----	1	0	0	----	2	1	0	----	6	14	31
AABbdDDee---	----	1	0	0	----	3	2	1	----	7	5	2	----	26	62	145
AaBBDdEe---	----	1	0	0	----	3	2	1	----	7	5	2	----	26	62	145
AaBbDDEe---	----	1	0	0	----	3	2	1	----	7	5	2	----	26	62	145
AaBbDdEe---	----	1	0	0	----	3	2	1	----	7	5	2	----	26	62	145
AABbddee---	----	0	0	0	----	0	1	0	----	1	1	1	----	31	17	62
AABbDdee---	----	0	0	0	----	0	1	0	----	1	1	1	----	31	17	62
AABbdDEe---	----	0	0	0	----	0	1	0	----	1	1	1	----	31	17	62
AaBBDDee---	----	0	0	0	----	0	1	0	----	1	1	1	----	31	17	62
AaBBDdEe---	----	0	0	0	----	0	1	0	----	1	1	1	----	31	17	62
AaBbDDEe---	----	0	0	0	----	0	1	0	----	1	1	1	----	31	17	62
AABbDdee---	----	0	0	0	----	2	2	1	----	3	5	5	----	12	74	28
AABbdDDee---	----	0	0	0	----	2	2	1	----	3	5	5	----	12	74	28
AABbdDdEe---	----	0	0	0	----	2	2	1	----	3	5	5	----	12	74	28
AaBBDDee---	----	0	0	0	----	2	2	1	----	3	5	5	----	12	74	28
AaBBDdEe---	----	0	0	0	----	2	2	1	----	3	5	5	----	12	74	28
AaBbDDEe---	----	0	0	0	----	2	2	1	----	3	5	5	----	12	74	28
AaBbDdEe---	----	0	0	0	----	2	2	1	----	3	5	5	----	12	74	28
aaBBDDEe---	----	0	0	0	----	2	2	1	----	3	5	5	----	12	74	28
aaBBDdEe---	----	0	0	0	----	2	2	1	----	3	5	5	----	12	74	28
AABbddee---	----	0	0	0	----	1	3	4	----	2	7	11	----	6	97	622
AABbdDde---	----	0	0	0	----	1	3	4	----	2	7	11	----	6	97	622
AABbdDEe---	----	D	0	0	----	1	3	4	----	2	7	11	----	6	97	622
AaBBDdee---	----	0	0	0	----	1	3	4	----	2	7	11	----	6	97	622
AaBBDDee---	----	0	0	0	----	1	3	4	----	2	7	11	----	6	97	622
AaBbdDEe---	----	0	0	0	----	1	3	4	----	2	7	11	----	6	97	622
AaBBDDee---	----	0	0	0	----	1	3	4	----	2	7	11	----	6	97	622
AaBbdDDee---	----	0	0	0	----	1	3	4	----	2	7	11	----	6	97	622
AaBBDdEe---	----	0	0	0	----	1	3	4	----	2	7	11	----	6	97	622
AaBbdDEe---	----	0	0	0	----	1	3	4	----	2	7	11	----	6	97	622
AaBBDDee---	----	0	0	0	----	1	3	4	----	2	7	11	----	6	97	622
AABbdDDee---	995	88	8	1	1,990	302	59	16	1,99D	359	96	42	3,980	1,222	796	1,624
AABbddee---	----	0	0	0	----	0	4	13	----	1	9	31	----	3	136	1,562
AaBBDdee---	----	0	0	0	----	0	4	13	----	1	9	31	----	3	136	1,562
aabbDDee---	----	0	0	0	----	0	4	13	----	1	9	31	----	3	136	1,562
aabbddEE---	----	0	0	0	----	0	4	13	----	1	9	31	----	3	136	1,562
AaBbdDde---	----	63	16	3	----	249	122	60	----	252	157	116	----	1,000	1,315	3,784
AaBbdDEe---	----	63	16	3	----	249	122	60	----	252	157	116	----	1,000	1,315	3,784
AaBbdDEe---	----	63	16	3	----	249	122	60	----	252	157	116	----	1,000	1,315	3,784
aaBbdDEe---	----	63	16	3	----	249	122	60	----	252	157	116	----	1,000	1,315	3,784
AaBbddee---	----	62	39	15	----	248	308	280	----	249	347	418	----	987	2,809	10,741
AaBbdDde---	----	62	39	15	----	248	308	280	----	249	347	418	----	987	2,809	10,741
AaBbdDEe---	----	62	39	15	----	248	308	280	----	249	347	418	----	987	2,809	10,741
aaBbdDEe---	----	62	39	15	----	248	308	280	----	249	347	418	----	987	2,809	10,741
aaBbdDDe---	----	62	39	15	----	248	308	280	----	249	347	418	----	987	2,809	10,741
aaBbdDEe---	----	62	39	15	----	248	308	280	----	249	347	418	----	987	2,809	10,741
AaBbddee---	----	62	109	93	----	247	859	1,555	----	248	904	193	----	981	7,095	38,270
AaBbdDde---	----	62	109	93	----	247	859	1,555	----	248	904	193	----	981	7,095	38,270
AaBbdDEe---	----	62	109	93	----	247	859	1,555	----	248	904	193	----	981	7,095	38,270
aaBbdDEe---	----	62	109	93	----	247	859	1,555	----	248	904	193	----	981	7,095	38,270
aabbddde---	----	62	348	812	----	247	2,742	12,781	----	247	2,798	13,927	----	978	21,414	208,080
Total---	1,020	1,041	1,094	1,291	2,015	4,091	8,672	21,062	2,040	4,247	9,449	25,011	4,030	16,603	75,922	460,901

Table 8.--Theoretical population and genotypic trends of female insects when native population of 2,000 insects (3 autosomal genes BBDDDE plus 1 sex-linked gene AA; female is heterogametic) is overflooded by 198,000 or 396,000 partially sterile insects (aabbdde and a-bdde) during parental, F₁, F₂, and F₃ generations. Matings between partially sterile insects are assumed to yield no offspring

Genotype	198,000 released with indicated sterility, increase, and generation															
	90 percent, fivefold				80 percent, fivefold				90 percent, tenfold				80 percent, tenfold			
	F ₁	F ₂	F ₃	F ₄	F ₁	F ₂	F ₃	F ₄	F ₁	F ₂	F ₃	F ₄	F ₁	F ₂	F ₃	F ₄
A BBDDDE---	50	1	0	0	50	3	0	0	100	8	1	0	100	20	9	12
A BBDDDe---	----	1	0	0	----	4	1	0	----	10	3	1	----	31	30	63
A BBDDde---	----	1	0	0	----	4	1	0	----	10	3	1	----	31	30	63
A BbDDDE---	----	1	0	0	----	4	1	0	----	10	3	1	----	31	30	63
A BBDDDe---	----	0	0	0	----	2	1	0	----	3	2	2	----	12	25	81
A BBddDE---	----	0	0	0	----	2	1	0	----	3	2	2	----	12	25	81
A bBDDDE---	----	0	0	0	----	2	1	0	----	3	2	2	----	12	25	81
A BBDDDe---	----	2	0	0	----	7	3	1	----	16	11	8	----	55	121	382
A BBddDe---	----	2	0	0	----	7	3	1	----	16	11	8	----	55	121	382
A BbDDDE---	----	2	0	0	----	7	3	1	----	16	11	8	----	55	121	382
A BBDDde---	----	1	0	0	----	3	3	3	----	6	10	12	----	24	117	563
A BBddde---	----	1	0	0	----	3	3	3	----	6	10	12	----	24	117	563
A BbDDde---	----	1	0	0	----	3	3	3	----	6	10	12	----	24	117	563
A BBddDe---	----	1	0	0	----	3	3	3	----	6	10	12	----	24	117	563
A bBDDDe---	----	1	0	0	----	3	3	3	----	6	10	12	----	24	117	563
a BBDDDE---	----	1	0	0	----	2	0	0	----	4	1	1	----	14	14	28
A BbDDDe---	495	59	7	1	990	183	51	21	990	247	108	84	1,980	770	891	3,001
a BBDDDe---	----	1	0	0	----	3	1	1	----	7	5	3	----	26	54	169
a BBddDE---	----	1	0	0	----	3	1	1	----	7	5	3	----	26	54	169
a bBDDDE---	----	1	0	0	----	3	1	1	----	7	5	3	----	26	54	169
A BBDDde---	----	0	0	0	----	2	4	6	----	3	10	22	----	12	135	964
A BBddde---	----	0	0	0	----	2	4	6	----	3	10	22	----	12	135	964
A bBDDde---	----	0	0	0	----	2	4	6	----	3	10	22	----	12	135	964
A BbDDde---	----	32	10	2	----	127	81	57	----	133	129	164	----	523	1,108	5,207
A BBddDe---	----	32	10	2	----	127	81	57	----	133	129	164	----	523	1,108	5,207
A bBddDe---	----	32	10	2	----	127	81	57	----	133	129	164	----	523	1,108	5,207
a BBDDDe---	----	0	0	0	----	2	2	1	----	3	4	5	----	12	5	251
a BBddDE---	----	0	0	0	----	2	2	1	----	3	4	5	----	12	5	251
a bBDDDE---	----	0	0	0	----	2	2	1	----	3	4	5	----	12	5	251
a BBDDde---	----	2	1	0	----	6	7	5	----	13	20	25	----	50	247	1,171
a BBddDe---	----	2	1	0	----	6	7	5	----	13	20	25	----	50	247	1,171
a BbDDDE---	----	2	1	0	----	6	7	5	----	13	20	25	----	50	247	1,171
A BbDDde---	----	31	22	10	----	124	173	201	----	127	222	414	----	499	1,849	10,894
A BBddDe---	----	31	22	10	----	124	173	201	----	127	222	414	----	499	1,849	10,894
A bBddDe---	----	31	22	10	----	124	173	201	----	127	222	414	----	499	1,849	10,894
a BBDDde---	----	1	1	0	----	3	9	12	----	6	2	46	----	24	277	1,989
a BBddDe---	----	1	1	0	----	3	9	12	----	6	2	46	----	24	277	1,989
a BbDDDE---	----	1	1	0	----	3	9	12	----	6	2	46	----	24	277	1,989
a BBddDe---	----	1	1	0	----	3	9	12	----	6	2	46	----	24	277	1,989
a bBDDDe---	----	1	1	0	----	3	9	12	----	6	2	46	----	24	277	1,989
a BBDDde---	----	1	1	0	----	3	9	12	----	6	2	46	----	24	277	1,989
a BBddDe---	----	1	1	0	----	3	9	12	----	6	2	46	----	24	277	1,989
a BbDDDe---	495	120	26	5	990	425	198	124	990	487	324	361	1,980	1,716	2,612	11,072
a BBDDde---	----	0	1	1	----	2	12	33	----	3	27	99	----	12	354	3,937
a BBddDe---	----	0	1	1	----	2	12	33	----	3	27	99	----	12	354	3,937
a bBDDDE---	----	0	1	1	----	2	12	33	----	3	27	99	----	12	354	3,937
A bBDDde---	----	31	57	52	----	123	445	914	----	124	500	1,402	----	487	3,927	28,412
a BbDDde---	----	93	53	22	----	370	410	434	----	376	530	899	----	1,474	4,251	23,017
a BBddDe---	----	93	53	22	----	370	410	434	----	376	530	899	----	1,474	4,251	23,017
a bBddDe---	----	93	53	22	----	370	410	434	----	376	530	899	----	1,474	4,251	23,017
a BbDDde---	----	93	13	113	----	367	1,039	1,963	----	370	1,169	3,020	----	1,450	8,997	59,844
a BBddDe---	----	93	13	113	----	367	1,039	1,963	----	370	1,169	3,020	----	1,450	8,997	59,844
a bBddDe---	----	93	13	113	----	367	1,039	1,963	----	370	1,169	3,020	----	1,450	8,997	59,844
a bBDDde---	----	92	404	884	----	365	3,136	13,733	----	367	3,286	16,461	----	1,438	24,211	227,634
Total----	1,040	1,083	1,161	1,386	2,030	4,182	9,107	22,987	2,080	4,502	10,805	32,644	4,060	17,200	85,703	603,418

Table 8.--Theoretical population and genotypic trends of female insects when native population of 2,000 insects (3 autosomal genes BBDEE plus 1 sex-linked gene AA; female is heterogametic) is overflooded by 198,000 or 396,000 partially sterile insects (aabbdee and a-bbdee) during parental, F_1 , F_2 , and F_3 generations. Matings between partially sterile insects are assumed to yield no offspring--
Continued

Genotype	396,000 released with indicated sterility, increase, and generation															
	90 percent, fivefold				80 percent, fivefold				90 percent, tenfold				80 percent, tenfold			
	F_1	F_2	F_3	F_4	F_1	F_2	F_3	F_4	F_1	F_2	F_3	F_4	F_1	F_2	F_3	F_4
A BBDEE---	25	0	0	0	25	1	0	0	50	3	0	0	50	8	2	2
A BBDEe---	----	1	0	0	----	2	0	0	----	4	1	0	----	14	9	12
A BBdDEE---	----	1	0	0	----	2	0	0	----	4	1	0	----	14	9	12
A BbDDEE---	----	1	0	0	----	2	0	0	----	4	1	0	----	14	9	12
A BBdDee---	----	0	0	0	----	1	0	0	----	2	1	0	----	6	10	20
A BBdDEe---	----	0	0	0	----	1	0	0	----	2	1	0	----	6	10	20
A bbDDEE---	----	0	0	0	----	1	0	0	----	2	1	0	----	6	10	20
A BBdDee---	----	1	0	0	----	3	1	0	----	7	3	1	----	26	44	90
A BbDDEe---	----	1	0	0	----	3	1	0	----	7	3	1	----	26	44	90
A BbDDEE---	----	1	0	0	----	3	1	0	----	7	3	1	----	26	44	90
A BBdDEE---	----	0	0	0	----	2	2	1	----	3	4	3	----	12	51	171
A BBdDee---	----	0	0	0	----	2	2	1	----	3	4	3	----	12	51	171
A BbDDEe---	----	0	0	0	----	2	2	1	----	3	4	3	----	12	51	171
A BbDDEE---	----	0	0	0	----	2	2	1	----	3	4	3	----	12	51	171
A BbDDee---	----	0	0	0	----	2	2	1	----	3	4	3	----	12	51	171
A bbDDEE---	----	0	0	0	----	2	2	1	----	3	4	3	----	12	51	171
A bbDDEe---	----	0	0	0	----	2	2	1	----	3	4	3	----	12	51	171
a BBDEE---	----	0	0	0	----	1	0	0	----	2	0	0	----	7	4	5
A BbDDee---	497	45	4	0	995	154	31	9	995	186	53	23	1,990	637	460	957
a BBdDEe---	----	0	0	0	----	2	1	0	----	3	2	1	----	13	20	40
a BBdDEE---	----	0	0	0	----	2	1	0	----	3	2	1	----	13	20	40
a BbDDEE---	----	0	0	0	----	2	1	0	----	3	2	1	----	13	20	40
A BBdDee---	----	0	0	0	----	1	2	2	----	2	5	7	----	6	66	373
A bbDDEe---	----	0	0	0	----	1	2	2	----	2	5	7	----	6	66	373
A bbdDEE---	----	0	0	0	----	1	2	2	----	2	5	7	----	6	66	373
A BbDDee---	----	32	8	2	----	126	63	32	----	129	84	63	----	512	731	2,173
A BbDDEe---	----	32	8	2	----	126	63	32	----	129	84	63	----	512	731	2,173
A bbdDEe---	----	32	8	2	----	126	63	32	----	129	84	63	----	512	731	2,173
a BBdDee---	----	0	0	0	----	1	1	0	----	2	2	1	----	6	2	77
a BBdDEe---	----	0	0	0	----	1	1	0	----	2	2	1	----	6	2	77
a bbdDEE---	----	0	0	0	----	1	1	0	----	2	2	1	----	6	2	77
a BBdDee---	----	1	0	0	----	3	3	2	----	6	8	6	----	25	105	353
a BbDDEe---	----	1	0	0	----	3	3	2	----	6	8	6	----	25	105	353
a BbDDEE---	----	1	0	0	----	3	3	2	----	6	8	6	----	25	105	353
A BbDDee---	----	31	20	8	----	125	157	144	----	126	180	220	----	500	1,502	5,992
A bbDDEe---	----	31	20	8	----	125	157	144	----	126	180	220	----	500	1,502	5,992
A bbdDEe---	----	31	20	8	----	125	157	144	----	126	180	220	----	500	1,502	5,992
a BBdDee---	----	0	0	0	----	2	4	5	----	3	9	14	----	12	134	762
a BBdDEe---	----	0	0	0	----	2	4	5	----	3	9	14	----	12	134	762
a BbDDEe---	----	0	0	0	----	2	4	5	----	3	9	14	----	12	134	762
a BbDDEE---	----	0	0	0	----	2	4	5	----	3	9	14	----	12	134	762
a bbDDEe---	----	0	0	0	----	2	4	5	----	3	9	14	----	12	134	762
a bbdDEE---	----	0	0	0	----	2	4	5	----	3	9	14	----	12	134	762
a BbDDee---	497	107	20	3	995	400	152	69	995	432	205	137	1,990	1,611	1,713	4,596
a BBdDee---	----	0	0	0	----	1	1	15	----	2	13	37	----	6	184	187
a bbDDEe---	----	0	0	0	----	1	1	16	----	2	13	37	----	6	184	187
a bbdDEE---	----	0	0	0	----	1	1	15	----	2	13	37	----	6	184	187
A bbdDee---	----	31	55	47	----	124	434	790	----	125	462	997	----	494	3,683	20,697
a BbDDee---	----	94	47	17	----	372	369	310	----	375	425	476	----	1,487	3,466	12,633
a BBdDEe---	----	94	47	17	----	372	369	310	----	375	425	476	----	1,487	3,466	12,633
a bbdDEe---	----	94	47	17	----	372	369	310	----	375	425	476	----	1,487	3,466	12,633
a BbDDee---	----	93	128	101	----	371	1,013	1,695	----	372	1,078	2,141	----	1,475	8,499	43,640
a bbDDEe---	----	93	128	101	----	371	1,013	1,695	----	372	1,078	2,141	----	1,475	8,499	43,640
a bbdDEe---	----	93	128	101	----	371	1,013	1,695	----	372	1,078	2,141	----	1,475	8,499	43,640
a bbdDee---	----	93	402	858	----	370	3,171	13,559	----	371	3,250	14,893	----	1,469	24,962	227,215
Total---	1,020	1,041	1,094	1,291	2,015	4,091	8,672	21,062	2,040	4,247	9,449	25,011	4,030	16,603	75,922	460,901

Table 9.--Theoretical population and genotypic trends when native population of 2,000 insects (aa) is overflooded by 198,000 or 396,000 partially sterile insects (AA) during parental, F₁, F₂, and F₃ generations. Matings between partially sterile insects are assumed to yield offspring proportionate to sterility level

Number released	Sterility	Rate of increase	Generation	Genotype			Total
				aa	Aa	AA	
	Percent						
198,000--	90	Fivefold--	F ₁	100	1,980	2,801	11,881
			F ₂	28	1,589	22,294	23,911
			F ₃	15	1,590	41,444	43,049
			F ₄	14	2,085	79,836	81,935
198,000--	80	--do--	F ₁	100	3,960	39,204	43,264
			F ₂	90	6,965	135,247	142,302
			F ₃	187	18,718	467,254	486,159
			F ₄	666	72,031	1,947,467	2,020,164
198,000--	90	Tenfold--	F ₁	200	3,960	19,602	23,762
			F ₂	214	8,136	77,221	85,571
			F ₃	647	30,532	360,367	391,546
			F ₄	4,295	213,463	2,652,338	2,870,096
198,000--	80	--do--	F ₁	200	7,920	78,408	86,528
			F ₂	608	35,665	522,838	559,111
			F ₃	4,492	282,671	4,447,347	4,734,510
			F ₄	43,113	2,736,651	43,428,196	46,207,960
396,000--	90	Fivefold--	F ₁	50	1,990	19,700	21,740
			F ₂	13	1,509	43,514	45,036
			F ₃	7	1,459	79,743	81,209
			F ₄	6	1,853	151,061	152,920
396,000--	80	--do--	F ₁	50	3,980	78,802	82,832
			F ₂	43	6,817	267,290	274,150
			F ₃	89	18,023	913,444	931,556
			F ₄	312	68,664	3,778,802	3,847,778
396,000--	90	Tenfold--	F ₁	101	3,980	39,401	43,482
			F ₂	99	7,705	149,256	157,060
			F ₃	282	27,540	671,474	699,296
			F ₄	1,803	185,990	4,796,866	4,984,659
396,000--	80	--do--	F ₁	101	7,960	157,604	165,665
			F ₂	296	34,985	1,032,234	1,067,515
			F ₃	2,162	274,441	8,708,310	8,984,913
			F ₄	20,710	2,652,099	84,907,327	87,580,136

Table 10.--Theoretical population and genotypic trends when native population of 2,000 insects (AABB) is overflooded by 198,000 or 396,000 partially sterile insects (aabb) during parental, F₁, F₂, and F₃ generations. Matings between partially sterile insects are assumed to yield offspring proportionate to sterility level

Number released	Fer-tility Percent	Rate of increase	Gener-ation	Genotype								Total
				AABB	AaBb	AaBb	AaBb	AaBb	AaBb	Aabb	Aabb	
198,000---	90	Fivefold--	F ₁	100	---	---	---	---	---	---	---	11,881
			F ₂	8	14	14	865	6	710	21,578	21,578	23,911
			F ₃	1	6	6	470	8	1,113	40,324	40,324	43,048
			F ₄	0	4	4	338	10	1,744	78,083	78,083	81,937
198,000--	80	--do--	F ₁	100	---	---	---	---	---	---	---	43,264
			F ₂	25	45	45	3,646	20	3,274	13,195	13,195	142,302
			F ₃	14	75	75	5,262	99	13,382	453,773	453,773	486,161
			F ₄	14	167	167	11,398	485	60,466	1,886,516	1,886,516	2,020,164
198,000--	90	Tenfold--	F ₁	200	---	---	---	---	---	---	---	23,762
			F ₂	64	106	106	4,423	44	3,606	73,570	73,570	85,569
			F ₃	57	271	271	9,464	319	20,797	339,252	339,252	391,547
			F ₄	123	1,208	1,208	40,859	2,964	171,397	2,477,981	2,477,981	2,870,101
198,000--	80	--do--	F ₁	200	---	---	---	---	---	---	---	86,528
			F ₂	167	303	303	18,662	138	16,700	506,000	506,000	559,111
			F ₃	384	1,805	1,805	81,598	2,338	199,268	4,245,740	4,245,740	4,734,508
			F ₄	1,031	11,273	11,273	473,583	30,809	2,251,795	41,145,583	41,145,583	46,207,951
396,000--	90	Fivefold--	F ₁	50	---	---	---	---	---	---	---	21,740
			F ₂	4	7	7	790	3	712	42,799	42,799	45,037
			F ₃	1	3	3	399	4	1,057	78,683	78,683	81,212
			F ₄	0	1	1	266	4	1,585	149,472	149,472	152,918
396,000--	80	--do--	F ₁	50	---	---	---	---	---	---	---	82,832
			F ₂	11	22	22	3,491	103	3,304	253,976	253,976	274,150
			F ₃	6	34	34	4,793	48	13,196	900,200	900,200	931,555
			F ₄	6	73	73	9,738	233	58,853	3,719,717	3,719,717	3,847,779
396,000--	90	Tenfold--	F ₁	100	---	---	---	---	---	---	---	43,482
			F ₂	27	50	50	4,033	23	3,622	145,612	145,612	157,062
			F ₃	21	113	113	7,747	149	19,680	651,646	651,646	699,296
			F ₄	39	453	453	29,574	1,311	155,964	4,639,600	4,639,600	4,984,668
396,000--	80	--do--	F ₁	100	---	---	---	---	---	---	---	165,664
			F ₂	78	148	148	17,916	71	16,921	1,015,242	1,015,242	1,067,517
			F ₃	151	841	841	74,085	1,170	199,515	8,507,627	8,507,627	8,984,915
			F ₄	406	4,987	4,987	396,944	15,317	2,250,169	82,641,852	82,641,852	87,580,148

Table 11.--Theoretical population and genotype trends when native population of 2,000 insects (AABDD) is overflooded by 198,000 or 396,000 partially sterile insects (aabbdd) during parental, F₁, F₂, and F₃ generations. Matings between partially sterile insects are assumed to yield offspring proportionate to sterility level

Genotype	198,000 released with indicated sterility, increase, and generation															
	90 percent, fivefold				80 percent, fivefold				90 percent, tenfold				80 percent, tenfold			
	F ₁	F ₂	F ₃	F ₄	F ₁	F ₂	F ₃	F ₄	F ₁	F ₂	F ₃	F ₄	F ₁	F ₂	F ₃	F ₄
AABDD---	100	3	0	0	100	7	1	0	200	22	6	5	200	50	32	33
AABDd---	---	4	1	0	---	12	6	4	---	31	26	40	---	83	147	302
AABdd---	---	4	1	0	---	12	6	4	---	31	26	40	---	83	147	302
AaBDD---	---	4	1	0	---	12	6	4	---	31	26	40	---	83	147	302
AaBdD---	---	1	1	0	---	5	7	10	---	11	25	78	---	34	169	696
AaBdd---	---	1	1	0	---	5	7	10	---	11	25	78	---	34	169	696
aABDD---	---	1	1	0	---	5	7	10	---	11	25	78	---	34	169	696
aABDd---	---	7	3	1	---	22	30	44	---	53	116	361	---	152	738	3,099
aABdd---	---	7	3	1	---	22	30	44	---	53	116	361	---	152	738	3,099
aabbDD---	---	7	3	1	---	22	30	44	---	53	116	361	---	152	738	3,099
AABbDd---	---	3	3	2	---	10	39	119	---	22	129	808	---	69	919	7,872
AABbDd---	---	3	3	2	---	10	39	119	---	22	129	808	---	69	919	7,872
AaBbDd---	---	3	3	2	---	10	39	119	---	22	129	808	---	69	919	7,872
AaBbDd---	---	3	3	2	---	10	39	119	---	22	129	808	---	69	919	7,872
aABbDd---	---	3	3	2	---	10	39	119	---	22	129	808	---	69	919	7,872
aABbDd---	---	3	3	2	---	10	39	119	---	22	129	808	---	69	919	7,872
AaBbDd---	---	1,980	503	155	64	3,960	1,986	1,601	2,063	3,960	2,567	3,290	9,261	10,161	25,690	95,302
AaBbDd---	---	1	4	7	---	5	53	355	---	---	11	164	---	34	1,250	22,241
aABbDd---	---	1	4	7	---	5	53	355	---	---	11	164	---	34	1,250	22,241
aabbDd---	---	1	4	7	---	5	53	355	---	---	11	164	---	34	1,250	22,241
AaBbDd---	---	355	313	273	---	1,637	3,631	9,291	---	---	1,803	6,058	---	8,350	55,170	375,179
AaBbDd---	---	355	313	273	---	1,637	3,631	9,291	---	---	1,803	6,058	---	8,350	55,170	375,179
aABbDd---	---	355	313	273	---	1,637	3,631	9,291	---	---	1,803	6,058	---	8,350	55,170	375,179
AaBbDd---	---	352	797	1,468	---	1,627	9,712	51,056	---	---	1,781	14,610	---	8,281	143,178	1,868,736
aABbDd---	---	352	797	1,468	---	1,627	9,712	51,056	---	---	1,781	14,610	---	8,281	143,178	1,868,736
aabbDd---	---	352	797	1,468	---	1,627	9,712	51,056	---	---	1,781	14,610	---	8,281	143,178	1,868,736
aabbDd---	---	352	797	1,468	---	1,627	9,712	51,056	---	---	1,781	14,610	---	8,281	143,178	1,868,736
aabbDd---	---	9,801	21,225	39,522	76,609	39,204	130,321	444,011	1,835,117	19,602	71,778	324,480	2,336,566	78,408	497,684	4,101,311
Total----	11,881	23,911	43,050	81,936	43,264	142,301	486,161	2,020,176	23,762	85,571	391,548	2,370,116	86,528	559,111	4,734,505	46,207,856

Table 11.--Theoretical population and genotypic trends when native population of 2,000 insects (AABDD) is overflooded by 198,000 or 396,000 partially sterile insects (aabbdd) during parental, F₁, F₂, and F₃ generations. Matings between partially sterile insects are assumed to yield offspring proportionate to sterility level--Continued

396,000 released with indicated sterility, increase, and generation																		
Genotype	90 percent, fivefold					80 percent, fivefold					90 percent, tenfold					80 percent, tenfold		
	F ₁	F ₂	F ₃	F ₄	F ₁	F ₂	F ₃	F ₄	F ₁	F ₂	F ₃	F ₄	F ₁	F ₂	F ₃	F ₄		
AABBD ---	50	1	0	0	0	50	3	0	0	101	8	2	1	101	21	12	10	
AABBD ---	---	2	0	0	0	---	6	2	1	---	14	9	11	---	39	61	105	
AABBD ---	---	2	0	0	0	---	6	2	1	---	14	9	11	---	39	61	105	
AABBD ---	---	2	0	0	0	---	6	2	1	---	14	9	11	---	39	61	105	
AABBD ---	---	1	0	0	0	---	3	3	4	---	6	11	27	---	18	79	291	
AABBD ---	---	1	0	0	0	---	3	3	4	---	6	11	27	---	18	79	291	
AABBD ---	---	1	0	0	0	---	3	3	4	---	6	11	27	---	18	79	291	
AABBD ---	---	3	1	0	0	---	11	13	18	---	25	46	119	---	74	331	1,241	
AABBD ---	---	3	1	0	0	---	11	13	18	---	25	46	119	---	74	331	1,241	
AABBD ---	---	3	1	0	0	---	11	13	18	---	25	46	119	---	74	331	1,241	
AABBD ---	---	1	1	1	1	---	5	19	54	---	11	58	323	---	35	450	3,641	
AABBD ---	---	1	1	1	1	---	5	19	54	---	11	58	323	---	35	450	3,641	
AABBD ---	---	1	1	1	1	---	5	19	54	---	11	58	323	---	35	450	3,641	
AABBD ---	---	1	1	1	1	---	5	19	54	---	11	58	323	---	35	450	3,641	
AABBD ---	---	1	1	1	1	---	5	19	54	---	11	58	323	---	35	450	3,641	
AABBD ---	---	1	1	1	1	---	5	19	54	---	11	58	323	---	35	450	3,641	
AABBD ---	---	1	1	1	1	---	5	19	54	---	11	58	323	---	35	450	3,641	
AABBD ---	---	1,990	431	117	42	3,980	1,829	1,336	1,510	3,980	2,197	2,358	5,385	7,960	9,382	21,119	66,405	
AABbd ---	---	1	2	3	3	---	3	27	174	---	6	80	960	---	18	641	11,385	
AABbd ---	---	1	2	3	3	---	3	27	174	---	6	80	960	---	18	641	11,385	
AABbd ---	---	1	2	3	3	---	3	27	174	---	6	80	960	---	18	641	11,385	
AABbd ---	---	356	281	223	223	---	1,652	3,443	8,211	---	1,811	5,343	24,070	---	8,460	52,635	329,296	
AABbd ---	---	356	281	223	223	---	1,652	3,443	8,211	---	1,811	5,343	24,070	---	8,460	52,635	329,296	
AABbd ---	---	356	281	223	223	---	1,652	3,443	8,211	---	1,811	5,343	24,070	---	8,460	52,635	329,296	
Aabbd ---	---	355	775	1,361	1,361	---	1,647	9,735	50,588	---	1,800	14,279	131,570	---	8,425	146,430	1,917,222	
Aabbd ---	---	355	775	1,361	1,361	---	1,647	9,735	50,588	---	1,800	14,279	131,570	---	8,425	146,430	1,917,222	
Aabbd ---	---	355	775	1,361	1,361	---	1,647	9,735	50,588	---	1,800	14,279	131,570	---	8,425	146,430	1,917,222	
Aabbd ---	---	19,700	42,444	77,906	148,108	78,802	262,326	890,439	3,668,955	39,401	143,806	637,286	4,507,058	157,604	1,006,799	8,360,540	80,713,024	
Total----	21,740	45,036	81,210	152,920	82,832	274,150	931,557	3,847,777	43,482	157,060	699,296	4,984,654	165,665	1,067,514	8,984,898	87,579,904		

Table 11.—Theoretical population and genotypic trends when native population of 2,000 insects (AABBDDEE) is overflooded by 198,000 or 396,000 partially sterile insects (aabbdee) during parental, F_1 , F_2 , and F_3 generations. Matings between partially sterile insects are assumed to yield offspring proportionate to sterility level

198,000 released with indicated sterility, increase, and generation																		
Genotype	90 percent, fivefold				80 percent, fivefold				90 percent, tenfold				80 percent, tenfold					
	F ₁	F ₂	F ₃	F ₄	F ₁	F ₂	F ₃	F ₄	F ₁	F ₂	F ₃	F ₄	F ₁	F ₂	F ₃	F ₄		
AA33DDxx	100	1	0	0	100	3	0	0	200	9	1	0	200	17	4	1		
AA33DDxx	----	1	0	0	----	4	1	0	----	10	3	2	----	24	14	11		
AA33Ddxx	----	1	0	0	----	4	1	0	----	10	3	2	----	24	14	11		
AA33DDxx	----	1	0	0	----	4	1	0	----	10	3	2	----	24	14	11		
Aa33DDxx	----	1	0	0	----	4	1	0	----	10	3	2	----	24	14	11		
AA33DDee	----	0	0	0	----	1	1	0	----	3	2	3	----	9	14	20		
AA33ddxx	----	0	0	0	----	1	1	0	----	3	2	3	----	9	14	20		
Aa33DDxx	----	0	0	0	----	1	1	0	----	3	2	3	----	9	14	20		
aa33DDxx	----	0	0	0	----	1	1	0	----	3	2	3	----	9	14	20		
AA33DdEe	----	2	0	0	----	6	3	1	----	16	12	14	----	41	64	94		
AA33DDEe	----	2	0	0	----	6	3	1	----	16	12	14	----	41	64	94		
AA33DdEe	----	2	0	0	----	6	3	1	----	16	12	14	----	41	64	94		
AA33DDee	----	2	0	0	----	6	3	1	----	16	12	14	----	41	64	94		
AA33DdEe	----	2	0	0	----	6	3	1	----	16	12	14	----	41	64	94		
Aa33DDxx	----	2	0	0	----	6	3	1	----	16	12	14	----	41	64	94		
aa33DDxx	----	2	0	0	----	6	3	1	----	16	12	14	----	41	64	94		
AA33Ddee	----	1	0	0	----	3	3	3	----	6	11	24	----	17	69	197		
AA33DdEe	----	1	0	0	----	3	3	3	----	6	11	24	----	17	69	197		
AA33DDEe	----	1	0	0	----	3	3	3	----	6	11	24	----	17	69	197		
AA33ddEe	----	1	0	0	----	3	3	3	----	6	11	24	----	17	69	197		
Aa33DDxx	----	1	0	0	----	3	3	3	----	6	11	24	----	17	69	197		
Aa33DdEe	----	1	0	0	----	3	3	3	----	6	11	24	----	17	69	197		
Aa33DDEe	----	1	0	0	----	3	3	3	----	6	11	24	----	17	69	197		
Aa33ddEe	----	1	0	0	----	3	3	3	----	6	11	24	----	17	69	197		
aa33DDxx	----	1	0	0	----	3	3	3	----	6	11	24	----	17	69	197		
aa33DdEe	----	1	0	0	----	3	3	3	----	6	11	24	----	17	69	197		
aa33DDEe	----	1	0	0	----	3	3	3	----	6	11	24	----	17	69	197		
aa33ddEe	----	1	0	0	----	3	3	3	----	6	11	24	----	17	69	197		
AA33DdEe	----	4	1	0	----	11	12	12	----	27	51	115	----	76	308	900		
AA33DDEe	----	4	1	0	----	11	12	12	----	27	51	115	----	76	308	900		
Aa33DDxx	----	4	1	0	----	11	12	12	----	27	51	115	----	76	308	900		
Aa33DdEe	----	4	1	0	----	11	12	12	----	27	51	115	----	76	308	900		
AA33Ddee	----	0	0	0	----	1	4	7	----</									

Table 12.--Theoretical population and genotypic trends when native population of 2,000 insects (AABBDDEE) is overflooded by 198,000 or 396,000 partially sterile insects (aabbdee) during parental, F₁, F₂, and F₃ generations. Matings between partially sterile insects are assumed to yield offspring proportionate to sterility level--Continued

Genotype	396,000 released with indicated sterility, increase, and generation															
	90 percent, fivefold				80 percent, fivefold				90 percent, tenfold				80 percent, tenfold			
	F ₁	F ₂	F ₃	F ₄	F ₁	F ₂	F ₃	F ₄	F ₁	F ₂	F ₃	F ₄	F ₁	F ₂	F ₃	F ₄
AABBDDEE	50	0	0	0	50	1	0	0	101	3	0	0	101	6	1	0
AABBDDEe	1	0	0	0	2	0	0	0	4	1	0	0	11	5	3	3
AABBDdEE	1	0	0	0	2	0	0	0	4	1	0	0	11	5	3	3
AABbDDEE	1	0	0	0	2	0	0	0	4	1	0	0	11	5	3	3
AaBBdDEE	1	0	0	0	2	0	0	0	4	1	0	0	11	5	3	3
AaBBDDEe	1	0	0	0	2	0	0	0	4	1	0	0	11	5	3	3
AABBDDEe	0	0	0	0	1	0	0	0	1	1	1	1	4	6	6	6
AABbdDEE	0	0	0	0	1	0	0	0	1	1	1	1	4	6	6	6
AABbDDEe	0	0	0	0	1	0	0	0	1	1	1	1	4	6	6	6
AaBBdDEe	0	0	0	0	1	0	0	0	1	1	1	1	4	6	6	6
AaBBDDEe	0	0	0	0	1	0	0	0	1	1	1	1	4	6	6	6
AABBDDEe	1	0	0	0	3	1	0	0	7	4	3	3	19	25	29	29
AABbdDEe	1	0	0	0	3	1	0	0	7	4	3	3	19	25	29	29
AABbDDEe	1	0	0	0	3	1	0	0	7	4	3	3	19	25	29	29
AaBBdDEe	1	0	0	0	3	1	0	0	7	4	3	3	19	25	29	29
AaBBDDEe	1	0	0	0	3	1	0	0	7	4	3	3	19	25	29	29
AaBbDDEe	1	0	0	0	3	1	0	0	7	4	3	3	19	25	29	29
AABBDDEe	0	0	0	0	1	1	1	1	3	4	7	7	9	31	74	74
AABbdDEe	0	0	0	0	1	1	1	1	3	4	7	7	9	31	74	74
AABbDDEe	0	0	0	0	1	1	1	1	3	4	7	7	9	31	74	74
AABbdDEe	0	0	0	0	1	1	1	1	3	4	7	7	9	31	74	74
AABbDDEe	0	0	0	0	1	1	1	1	3	4	7	7	9	31	74	74
AaBBdDEe	0	0	0	0	1	1	1	1	3	4	7	7	9	31	74	74
AaBBDDEe	0	0	0	0	1	1	1	1	3	4	7	7	9	31	74	74
AaBbDDEe	0	0	0	0	1	1	1	1	3	4	7	7	9	31	74	74
AaBBDDEe	0	0	0	0	1	1	1	1	3	4	7	7	9	31	74	74
AaBbDDEe	0	0	0	0	1	1	1	1	3	4	7	7	9	31	74	74
AABBDDEe	2	0	0	0	5	5	4	4	12	19	33	33	37	132	321	321
AABbdDEe	2	0	0	0	5	5	4	4	12	19	33	33	37	132	321	321
AABbDDEe	2	0	0	0	5	5	4	4	12	19	33	33	37	132	321	321
AaBBdDEe	2	0	0	0	5	5	4	4	12	19	33	33	37	132	321	321
AABBDDEe	0	0	0	0	1	2	3	3	1	5	19	19	4	42	211	211
AABbdDEe	0	0	0	0	1	2	3	3	1	5	19	19	4	42	211	211
AABbDDEe	0	0	0	0	1	2	3	3	1	5	19	19	4	42	211	211
AaBBdDEe	0	0	0	0	1	2	3	3	1	5	19	19	4	42	211	211
AaBBDDEe	0	0	0	0	1	2	3	3	1	5	19	19	4	42	211	211
AaBbDDEe	0	0	0	0	1	2	3	3	1	5	19	19	4	42	211	211
AABBDDEe	1	1	0	0	3	7	13	13	6	23	83	83	18	174	891	891
AABbdDEe	1	1	0	0	3	7	13	13	6	23	83	83	18	174	891	891
AABbDDEe	1	1	0	0	3	7	13	13	6	23	83	83	18	174	891	891
AaBBdDEe	1	1	0	0	3	7	13	13	6	23	83	83	18	174	891	891
AaBBDDEe	1	1	0	0	3	7	13	13	6	23	83	83	18	174	891	891
AaBbDDEe	1	1	0	0	3	7	13	13	6	23	83	83	18	174	891	891
AABBDDEe	1	1	0	0	3	7	13	13	6	23	83	83	18	174	891	891
AABbdDEe	1	1	0	0	3	7	13	13	6	23	83	83	18	174	891	891
AABbDDEe	1	1	0	0	3	7	13	13	6	23	83	83	18	174	891	891
AaBBdDEe	1	1	0	0	3	7	13	13	6	23	83	83	18	174	891	891
AaBBDDEe	1	1	0	0	3	7	13	13	6	23	83	83	18	174	891	891
AaBbDDEe	1	1	0	0	3	7	13	13	6	23	83	83	18	174	891	891
AABBDDEe	0	1	1	1	1	10	40	40	3	31	233	233	9	245	2,676	2,676
AABbdDEe	0	1	1	1	1	10	40	40	3	31	233	233	9	245	2,676	2,676
AABbDDEe	0	1	1	1	1	10	40	40	3	31	233	233	9	245	2,676	2,676
AaBBdDEe	0	1	1	1	1	10	40	40	3	31	233	233	9	245	2,676	2,676
AaBBDDEe	0	1	1	1	1	10	40	40	3	31	233	233	9	245	2,676	2,676
AaBbDDEe	0	1	1	1	1	10	40	40	3	31	233	233	9	245	2,676	2,676
AABBDDEe	0	1	1	1	1	10	40	40	3	31	233	233	9	245	2,676	2,676
AABbdDEe	0	1	1	1	1	10	40	40	3	31	233	233	9	245	2,676	2,676
AABbDDEe	0	1	1	1	1	10	40	40	3	31	233	233	9	245	2,676	2,676
AaBBdDEe	0	1	1	1	1	10	40	40	3	31	233	233	9	245	2,676	2,676
AaBBDDEe	0	1	1	1	1	10	40	40	3	31	233	233	9	245	2,676	2,676
AaBbDDEe	0	1	1	1	1	10	40	40	3	31	233	233	9	245	2,676	2,676
AABBDDEe	178	79	34	34	826	929	1,241	1,241	906	1,538	4,210	4,210	4,230	14,445	53,340	53,340
AABbdDEe	178	79	34	34	826	929	1,241	1,241	906	1,538	4,210	4,210	4,230	14,445	53,340	53,340
AABbDDEe	178	79	34	34	826	929	1,241	1,241	906	1,538	4,210	4,210	4,230	14,445	53,340	53,340
AaBBdDEe	178	79	34	34	826	929	1,241	1,241	906	1,538	4,210	4,210	4,230	14,445	53,340	53,340
AABBDDEe	177	202	189	189	823	2,507	6,957	6,957	900	3,782	19,777	19,777	4,213	38,015	275,066	275,066
AABbdDEe	177	202	189	189	823	2,507	6,957	6,957	900	3,782	19,777	19,777	4,213	38,015	275,066	275,066
AABbDDEe	177	202	189	189	823	2,507	6,957	6,957	900	3,782	19,777	19,777	4,213	38,015	275,066	275,066
AaBBdDEe	177	202	189	189	823	2,507	6,957	6,957	900	3,782	19,777	19,777	4,213	38,015	275,066	275,066
AaBBDDEe	177	202	189	189	823	2,507	6,957	6,957	900	3,782	19,777	19,777	4,213	38,015	275,066	275,066
AaBbDDEe	177	202	189	189	823	2,507	6,957	6,957	900	3,782	19,777	19,777	4,213	38,015	275,066	275,066
AABBDDEe	177	472	1,171	1,171	822	7,218	43,590	43,590	897	10,466	111,560	111,560	4,204	1,081,706	1,639,488	1,639,488
AABbdDEe	177	472	1,171	1,171	822	7,218	43,590	43,590	897	10,466	111,560	111,560	4,204	1,081,706	1,639,488	1,639,488
AABbDDEe	177	472	1,171	1,171	822	7,218	43,590	43,590	897	10,466	111,560	111,560	4,204	1,081,706	1,639,488	1,639,488
AaBBdDEe	177	472	1,171	1,171	822	7,218	43,590	43,590	897	10,466	111,560	111,560	4,204	1,081,706	1,639,488	1,639,488
aabbddee	19,700	42,267	77,333	146,934	78,802	261,504	883,205	3,625,230	39,401	142,907	626,777	4,394,789	157,604	1,002,591	8,252,021	79,065,153
Total	21,741	45,036	81,209	152,919	82,832	274,150	931,556	3,847,774	43,481	157,060	699,296	4,984,656	165,664	1,067,514	8,984,906	87,580,048

198,000 released with indicated sterility, increase, and generation																			
Genotype	90 percent, fivefold				80 percent, fivefold				90 percent, tenfold				80 percent, tenfold						
	F ₁	F ₂	F ₃	F ₄	F ₁	F ₂	F ₃	F ₄	F ₁	F ₂	F ₃	F ₄	F ₁	F ₂	F ₃	F ₄			
AA33DDEE	50	1	0	0	50	1	0	0	100	5	0	0	100	8	2	1	1		
AA33DDEE		1	0	0		2	0	0		5	2	1		12	7	5	5		
AA33DdEE		1	0	0		2	0	0		5	2	1		12	7	5	5		
AA33DDEE		1	0	0		2	0	0		5	2	1		12	7	5	5		
Aa33DDEE		1	0	0		2	0	0		5	2	1		12	7	5	5		
AA33DDeE		0	0	0		1	0	0		1	1	1		4	7	10	10		
AA33dDEE		0	0	0		1	0	0		1	1	1		4	7	10	10		
AA33DDEE		0	0	0		1	0	0		1	1	1		4	7	10	10		
Aa33DDEE		0	0	0		1	0	0		1	1	1		4	7	10	10		
AA33DdEe		1	0	0		3	1	1		7	6	7		21	32	47	47		
AA33DDEE		1	0	0		3	1	1		7	6	7		21	32	47	47		
Aa33DdEe		1	0	0		3	1	1		7	6	7		21	32	47	47		
Aa33DDEE		1	0	0		3	1	1		7	6	7		21	32	47	47		
Aa33DdEe		1	0	0		3	1	1		7	6	7		21	32	47	47		
Aa33DDEE		1	0	0		3	1	1		7	6	7		21	32	47	47		
Aa33DdEe		1	0	0		3	1	1		7	6	7		21	32	47	47		
AA33DDeE		0	0	0		1	1	1		3	5	12		9	35	99	99		
AA33DdEe		0	0	0		1	1	1		3	5	12		9	35	99	99		
AA33DDEE		0	0	0		1	1	1		3	5	12		9	35	99	99		
AA33dDEE		0	0	0		1	1	1		3	5	12		9	35	99	99		
AA33DDEE		0	0	0		1	1	1		3	5	12		9	35	99	99		
Aa33DDEE		0	0	0		1	1	1		3	5	12		9	35	99	99		
Aa33DdEe		0	0	0		1	1	1		3	5	12		9	35	99	99		
Aa33DDEE		0	0	0		1	1	1		3	5	12		9	35	99	99		
Aa33DdEe		0	0	0		1	1	1		3	5	12		9	35	99	99		
Aa33DDEE		0	0	0		1	1	1		3	5	12		9	35	99	99		
Aa33DdEe		0	0	0		1	1	1		3	5	12		9	35	99	99		
AA33DdEe		2	1	0		6	6	6		13	26	57		38	154	450	450		
AA33DDEE		2	1	0		6	6	6		13	26	57		38	154	450	450		
Aa33DDEE		2	1	0		6	6	6		13	26	57		38	154	450	450		
Aa33DdEe		2	1	0		6	6	6		13	26	57		38	154	450	450		
AA33DdEe		0	0	0		1	0	0		1	6	26		4	43	239	239		
AA33DDEE		0	0	0		1	0	0		1	6	26		4	43	239	239		
AA33dDEE		0	0	0		1	0												

396,000 released with indicated sterility, increase, and generation																	
Genotype	9D percent, fivefold				80 percent, fivefold				90 percent, tenfold				BD percent, tenfold				
	F ₁	F ₂	F ₃	F ₄	F ₁	F ₂	F ₃	F ₄	F ₁	F ₂	F ₃	F ₄	F ₁	F ₂	F ₃	F ₄	
AABBDDEE --- 25	0	0	0	0	25	D	0	0	50	1	0	0	50	3	1	0	0
AABBDdEe ---	0	0	0	0	---	1	0	0	---	2	0	0	---	5	2	1	1
AABBDdEE ---	0	0	0	0	---	1	0	0	---	2	0	0	---	5	2	1	1
AABbDDEE ---	0	0	0	0	---	1	0	0	---	2	0	0	---	5	2	1	1
AaBBDDEE ---	0	0	0	0	---	1	0	0	---	2	0	0	---	5	2	1	1
AABBDDee ---	0	0	0	0	---	0	0	0	---	1	0	D	---	2	3	3	3
AABbdDEE ---	0	0	0	0	---	0	0	0	---	1	0	0	---	2	3	3	3
AabbDDEE ---	0	0	0	0	---	0	0	0	---	1	0	0	---	2	3	3	3
aaBBDDEE ---	D	0	0	0	---	0	0	0	---	1	0	0	---	2	3	3	3
AABbDdEe ---	0	0	0	0	---	1	0	0	---	3	2	2	---	10	12	14	14
AABbDDEe ---	0	0	0	0	---	1	0	0	---	3	2	2	---	10	12	14	14
AABbDdEE ---	0	0	0	0	---	1	D	0	---	3	2	2	---	10	12	14	14
AaBBDDEe ---	0	0	0	0	---	1	0	0	---	3	2	2	---	10	12	14	14
AaBBDdEE ---	0	0	0	0	---	1	0	0	---	3	2	2	---	10	12	14	14
AaBbDDEE ---	0	0	0	0	---	1	0	0	---	3	2	2	---	10	12	14	14
AABBDdee ---	0	0	0	0	---	1	1	1	---	1	2	4	---	4	15	37	37
AABbdDEe ---	0	0	0	0	---	1	1	1	---	1	2	4	---	4	15	37	37
AABbDDee ---	0	0	0	0	---	1	1	1	---	1	2	4	---	4	15	37	37
AABbdDEE ---	0	0	0	0	---	1	1	1	---	1	2	4	---	4	15	37	37
AABbDDEE ---	0	0	0	0	---	1	1	1	---	1	2	4	---	4	15	37	37
AaBBDDee ---	0	0	0	0	---	1	1	1	---	1	2	4	---	4	15	37	37
AaBbdDEE ---	0	0	0	0	---	1	1	1	---	1	2	4	---	4	15	37	37
AaBBDDEE ---	0	0	0	0	---	1	1	1	---	1	2	4	---	4	15	37	37
aaBBDDEe ---	0	0	0	0	---	1	1	1	---	1	2	4	---	4	15	37	37
aaBbdDEE ---	0	0	0	0	---	1	1	1	---	1	2	4	---	4	15	37	37
aaBBDDEE ---	0	0	0	0	---	1	1	1	---	1	2	4	---	4	15	37	37
AABbDdEe ---	1	0	0	0	---	3	3	2	---	6	9	16	---	19	66	161	161
AABBDDee ---	1	0	0	0	---	3	3	2	---	6	9	16	---	19	66	161	161
AABbDDEe ---	1	0	0	0	---	3	3	16	---	6	9	16	---	19	66	161	161
AaBbDdEE ---	1	0	0	0	---	3	3	2	---	6	9	16	---	19	66	161	161
AABbddee ---	0	0	0	0	---	0	1	2	---	1	3	10	---	2	21	105	105
AAbbdDEe ---	0	0	0	0	---	0	1	2	---	1	3	10	---	2	21	105	105
AAbbddee ---	0	0	0	0	---	0	1	2	---	1	3	10	---	2	21	105	105
aaBBDDee ---	0	0	0	0	---	0	1	2	---	1	3	10	---	2	21	105	105
aaBbdDEE ---	0	0	0	0	---	0	1	2	---	1	3	10	---	2	21	105	105
AABbDdeE ---	0	0	0	0	---	1	4	6	---	3	11	41	---	9	87	445	445
AABbdDEe ---	0	0	0	0	---	1	4	6	---	3	11	41	---	9	87	445	445
AABbdDEE ---	0	0	0	0	---	1	4	6	---	3	11	41	---	9	87	445	445
AaBBDDee ---	0	0	0	0	---	1	4	6	---	3	11	41	---	9	87	445	445
AaBbdDEe ---	0	0	0	0	---	1	4	6	---	3	11	41	---	9	87	445	445
AaBbdDEE ---	0	0	0	0	---	1	4	6	---	3	11	41	---	9	87	445	445
AaBBDDee ---	0	0	0	0	---	1	4	6	---	3	11	41	---	9	87	445	445
AaBbdDEE ---	0	0	0	0	---	1	4	6	---	3	11	41	---	9	87	445	445
AaBBDDee ---	0	0	0	0	---	1	4	6	---	3	11	41	---	9	87	445	445
aaBBDDee ---	0	0	0	0	---	1	4	6	---	3	11	41	---	9	87	445	445
aaBbdDEE ---	0	0	0	0	---	1	4	6	---	3	11	41	---	9	87	445	445
AABbddee ---	0	0	0	0	---	1	5	20	---	1	15	117	---	4	122	1,338	1,338
AAbbdDEe ---	0	0	0	0	---	1	5	20	---	1	15	117	---	4	122	1,338	1,338
AAbbdDEE ---	0	0	0	0	---	1	5	20	---	1	15	117	---	4	122	1,338	1,338
AaBBDDee ---	0	0	0	0	---	1	5	20	---	1	15	117	---	4	122	1,338	1,338
AaBbdDEe ---	0	0	0	0	---	1	5	20	---	1	15	117	---	4	122	1,338	1,338
AaBbdDEE ---	0	0	0	0	---	1	5	20	---	1	15	117	---	4	122	1,338	1,338
aaBBDDee ---	0	0	0	0	---	1	5	20	---	1	15	117	---	4	122	1,338	1,338
aaBbdDEE ---	0	0	0	0	---	1	5	20	---	1	15	117	---	4	122	1,338	1,338
aaBBDDee ---	0	0	0	0	---	1	5	20	---	1	15	117	---	4	122	1,338	1,338
AABbDdEe ---	995	125	19	4	1,990	499	201	132	1,990	640	401	571	3,980	2,557	3,271	6,371	6,371
AABbdDEe ---	0	1	1	1	---	0	7	66	---	1	22	354	---	2	177	4,249	4,249
aaBBDDee ---	0	1	1	1	---	0	7	66	---	1	22	354	---	2	177	4,249	4,249
aabbDDEe ---	0	1	1	1	---	0	7	66	---	1	22	354	---	2	177	4,249	4,249
aabbDDEE ---	0	1	1	1	---	0	7	66	---	1	22	354	---	2	177	4,249	4,249
AaBbDdeE ---	89	39	17	17	---	413	465	620	---	453	769	2,105	---	2,115	7,223	26,669	26,669
AaBbdDEe ---	89	39	17	17	---	413	465	620	---	453	769	2,105	---	2,115	7,223	26,669	26,669
AaBbDDEe ---	89	39	17	17	---	413	465	620	---	453	769	2,105	---	2,115	7,223	26,669	26,669
AaBbDdEE ---	89	39	17	17	---	413	465	620	---	453	769	2,105	---	2,115	7,223	26,669	26,669
AaBbddee ---	89	101	94	94	---	412	1,253	3,478	---	450	1,891	9,888	---	2,106	19,007	137,527	137,527
AABbdDEe ---	89	101	94	94	---	412	1,253	3,478	---	450	1,891	9,888	---	2,106	19,007	137,527	137,527
AABbdDEE ---	89	101	94	94	---	412	1,253	3,478	---	450	1,891	9,888	---	2,106	19,007	137,527	137,527
aaBBDDee ---	89	101	94	94	---	412	1,253	3,478	---	450	1,891	9,888	---	2,106	19,007	137,527	137,527
aaBbdDEE ---	89	101	94	94	---	412	1,253	3,478	---	450	1,891	9,888	---	2,106	19,007	137,527	137,527
AaBbddee ---	88	286	586	586	---	411	3,609	21,795	---	449	5,233	55,779	---	2,102	54,084	819,703	819,703
AaBbdDEe ---	88	286	586	586	---	411	3,609	21,795	---	449	5,233	55,779	---	2,102	54,084	819,703	819,703
AaBbdDEE ---	88	286	586	586	---	411	3,609	21,795	---	449	5,233	55,779	---	2,102	54,084	819,703	819,703
AabbddEe ---	88	286	586	586	---	411	3,609	21,795	---	449	5,233	55,779	---	2,102	54,084	819,703	819,703
aabbddde	9,850	21,133	38,666	73,467	39,401	130,752	441,601	1,812,597	19,700	71,454	313,387	2,197,379	78,802	501,294	4,125,979	39,532,192	39,532,192
Total-----	10,870	22,518	40,605	76,459	41,416	137,075	465,776	1,923,866	21,741	78,530	349,646	2,492,303	82,832	533,756	4,492,411	43,789,424	43,789,424

Table 1.---Theoretical population and genotypic trends of female insects when native population of 2,000 insects (3 autosomal genes BBDDEE plus 1 sex-linked gene AA; female is heterogametic) is overflooded by 198,000 or 396,000 partially sterile insects (aabbdee and a-bbdee) during parental, F₁, F₂, and F₃ generations. Matings between partially sterile insects are assumed to yield no offspring

Genotype	198,000 released with indicated sterility, increase, and generation															
	90 percent, fivefold				80 percent, fivefold				90 percent, tenfold				80 percent, tenfold			
	F ₁	F ₂	F ₃	F ₄	F ₁	F ₂	F ₃	F ₄	F ₁	F ₂	F ₃	F ₄	F ₁	F ₂	F ₃	F ₄
A BBDDEE --- 50	1	0	0	0	50	2	0	0	100	7	1	1	100	15	6	3
A BBDDEe --- ----	1	0	0	0	----	3	1	0	----	9	4	4	----	22	23	29
A BBDdEE --- ----	1	0	0	0	----	3	1	0	----	9	4	4	----	22	23	29
A BbDDEE --- ----	1	0	0	0	----	3	1	0	----	9	4	4	----	22	23	29
A BBDDee --- ----	0	0	0	0	----	1	1	1	----	3	4	7	----	9	2	60
A BbDDEe --- ----	0	0	0	0	----	1	1	1	----	3	4	7	----	9	2	60
A bbDDEE --- ----	0	0	0	0	----	1	1	1	----	3	4	7	----	9	2	60
A BBDdEe --- ----	2	0	0	0	----	6	4	4	----	14	19	35	----	40	109	272
A BbDDEe --- ----	2	0	0	0	----	6	4	4	----	14	19	35	----	40	109	272
A BbDdEE --- ----	2	0	0	0	----	6	4	4	----	14	19	35	----	40	109	272
A BBDdee --- ----	1	0	0	0	----	3	5	9	----	6	19	70	----	17	126	625
A BbDdEe --- ----	1	0	0	0	----	3	5	9	----	6	19	70	----	17	126	625
A BbDDEe --- ----	1	0	0	0	----	3	5	9	----	6	19	70	----	17	126	625
A BbDdEe --- ----	1	0	0	0	----	3	5	9	----	6	19	70	----	17	126	625
A BbDDEE --- ----	1	0	0	0	----	3	5	9	----	6	19	70	----	17	126	625
A BbDdEE --- ----	1	0	0	0	----	3	5	9	----	6	19	70	----	17	126	625
a BBDDEE --- ----	1	0	0	0	----	2	0	0	----	4	2	2	----	10	11	13
A BbDdEe --- 495	82	15	4	990	295	142	115	990	423	352	669	1,980	1,515	2,420	6,026	
a BBDDEe --- ----	1	0	0	0	----	3	2	2	----	7	8	16	----	19	50	122
a BBDdEE --- ----	1	0	0	0	----	3	2	2	----	7	8	16	----	19	50	122
a BbDDEE --- ----	1	0	0	0	----	3	2	2	----	7	8	16	----	19	50	122
A BBDdee --- ----	1	1	1	----	1	7	25	----	3	22	163	----	9	164	1,631	
A BbBDEe --- ----	0	1	1	----	1	7	25	----	3	22	163	----	9	164	1,631	
A BbDDEE --- ----	0	1	1	----	1	7	25	----	3	22	163	----	9	164	1,631	
A BbDdee --- ----	45	24	13	----	207	269	419	----	231	510	1,791	----	1,061	4,263	19,077	
A BbDdEe --- ----	45	24	13	----	207	269	419	----	231	510	1,791	----	1,061	4,263	19,077	
A BbDDEe --- ----	45	24	13	----	207	269	419	----	231	510	1,791	----	1,061	4,263	19,077	
a BBDDee --- ----	0	0	0	----	1	3	4	----	3	9	32	----	9	60	289	
a BBDdEE --- ----	0	0	0	----	1	3	4	----	3	9	32	----	9	60	289	
a BbDDEE --- ----	0	0	0	----	1	3	4	----	3	9	32	----	9	60	289	
a BBDdEe --- ----	2	1	0	----	5	11	18	----	12	39	145	----	36	260	128	
a BbDDEe --- ----	2	1	0	----	5	11	18	----	12	39	145	----	36	260	128	
a BbDdEE --- ----	2	1	0	----	5	11	18	----	12	39	145	----	36	260	128	
A BbDdee --- ----	44	55	57	----	205	653	1,954	----	225	1,051	6,352	----	1,044	9,863	78,026	
A BbDDEe --- ----	44	55	57	----	205	653	1,954	----	225	1,051	6,352	----	1,044	9,863	78,026	
A BbDdEe --- ----	44	55	57	----	205	653	1,954	----	225	1,051	6,352	----	1,044	9,863	78,026	
a BBDdee --- ----	1	1	1	----	3	14	51	----	6	46	333	----	17	334	3,310	
a BBDdEe --- ----	1	1	1	----	3	14	51	----	6	46	333	----	17	334	3,310	
a BbDDEe --- ----	1	1	1	----	3	14	51	----	6	46	333	----	17	334	3,310	
a BbDdEE --- ----	1	1	1	----	3	14	51	----	6	46	333	----	17	334	3,310	
a BbDDEE --- ----	1	1	1	----	3	14	51	----	6	46	333	----	17	334	3,310	
a BbDdEE --- ----	1	1	1	----	3	14	51	----	6	46	333	----	17	334	3,310	
a BbDDEe --- 495 169	62	28	990	698	658	917	990	861	1,293	3,961	1,980	3,565	10,425	41,623		
a BBDdee --- ----	0	1	3	----	1	20	152	----	3	60	876	----	9	461	9,489	
a BbDDEe --- ----	0	1	3	----	1	20	152	----	3	60	876	----	9	461	9,489	
a BbDdEE --- ----	0	1	3	----	1	20	152	----	3	60	876	----	9	461	9,489	
A BbDdee --- ----	44	146	313	----	203	1,794	10,962	----	223	2,661	29,361	----	1,035	26,392	398,638	
a BbDDEe --- ----	132	132	124	----	611	1,547	4,226	----	671	2,520	13,827	----	3,114	23,322	168,505	
a BbDdEe --- ----	132	132	124	----	611	1,547	4,226	----	671	2,520	13,827	----	3,114	23,322	168,505	
a BbDDEE --- ----	132	132	124	----	611	1,547	4,226	----	671	2,520	13,827	----	3,114	23,322	168,505	
a BbDdee --- ----	132	344	677	----	609	4,203	23,573	----	665	6,254	63,322	----	3,097	61,725	856,318	
a BbDDEe --- ----	132	344	677	----	609	4,203	23,573	----	665	6,254	63,322	----	3,097	61,725	856,318	
a BbDdEE --- ----	132	344	677	----	609	4,203	23,573	----	665	6,254	63,322	----	3,097	61,725	856,318	
a BbDDEe --- 4,900 10,568	19,615	37,990	19,602	64,957	220,209	906,583	9,801	35,666	159,577	1,138,900	39,204	247,807	2,024,255	19,228,432		
Total ----	5,940	11,955	21,525	40,967	21,632	71,150	243,078	1,010,071	11,881	42,786	195,771	1,435,022	43,264	279,555	2,367,239	23,103,616

Table 14.--Theoretical population and genotypic trends of female insects when native population of 2,000 insects (3 autosomal genes BBDEE plus 1 sex-linked gene AA; female is heterogametic) is overflooded by 198,000 or 396,000 partially sterile insects (aabbdee and a-bbdee) during parental, F₁, F₂, and F₃ generations. Matings between partially sterile insects are assumed to yield no offspring--Continued

Genotype	396,000 released with indicated sterility, increase, and generation															
	90 percent, fivefold				80 percent, fivefold				90 percent, tenfold				80 percent, tenfold			
	F ₁	F ₂	F ₃	F ₄	F ₁	F ₂	F ₃	F ₄	F ₁	F ₂	F ₃	F ₄	F ₁	F ₂	F ₃	F ₄
A BBDEE---	25	0	0	0	25	1	0	0	50	2	0	0	50	6	2	1
A BBDEE---	----	0	0	0	----	1	0	0	----	4	1	1	----	10	9	9
A BBdEE---	----	0	0	0	----	1	0	0	----	4	1	1	----	10	9	9
A BbDEE---	----	0	0	0	----	1	0	0	----	4	1	1	----	10	9	9
A BBDEE---	----	0	0	0	----	1	0	0	----	4	1	1	----	10	9	9
A BBdEE---	----	0	0	0	----	1	0	0	----	1	1	2	----	4	11	22
A BBdEE---	----	0	0	0	----	1	0	0	----	1	1	2	----	4	11	22
A bbDEE---	----	0	0	0	----	1	0	0	----	1	1	2	----	4	11	22
A BBdEE---	----	1	0	0	----	3	2	1	----	6	7	10	----	19	45	95
A BbDEE---	----	1	0	0	----	3	2	1	----	6	7	10	----	19	45	95
A BbDEE---	----	1	0	0	----	3	2	1	----	6	7	10	----	19	45	95
A BBdEE---	----	0	0	0	----	1	2	4	----	3	8	24	----	9	59	260
A BbDEE---	----	0	0	0	----	1	2	4	----	3	8	24	----	9	59	260
A BbDEE---	----	0	0	0	----	1	2	4	----	3	8	24	----	9	59	260
A BbDEE---	----	0	0	0	----	1	2	4	----	3	8	24	----	9	59	260
A bbDEE---	----	0	0	0	----	1	2	4	----	3	8	24	----	9	59	260
A bbDEE---	----	0	0	0	----	1	2	4	----	3	8	24	----	9	59	260
a BBDEE---	----	0	0	0	----	1	0	0	----	2	1	0	----	5	4	4
A BbDEE---	497	64	10	2	995	252	103	68	995	326	210	302	1,990	1,297	1,701	3,347
a BBDEE---	----	0	0	0	----	1	1	1	----	3	3	4	----	9	22	44
a BBdEE---	----	0	0	0	----	1	1	1	----	3	3	4	----	9	22	44
a BbDEE---	----	0	0	0	----	1	1	1	----	3	3	4	----	9	22	44
A BBdEE---	----	0	0	0	----	1	3	12	----	1	10	68	----	4	82	774
A BbDEE---	----	0	0	0	----	1	3	12	----	1	10	68	----	4	82	774
A BbDEE---	----	0	0	0	----	1	3	12	----	1	10	68	----	4	82	774
A BbDEE---	----	45	20	9	----	208	236	317	----	229	396	1,094	----	1,066	3,698	13,780
A BbDEE---	----	45	20	9	----	208	236	317	----	229	396	1,094	----	1,066	3,698	13,780
A BbDEE---	----	45	20	9	----	208	236	317	----	229	396	1,094	----	1,066	3,698	13,780
a BBDEE---	----	0	0	0	----	1	1	2	----	1	4	11	----	4	29	124
a BBdEE---	----	0	0	0	----	1	1	2	----	1	4	11	----	4	29	124
a BbDEE---	----	0	0	0	----	1	1	2	----	1	4	11	----	4	29	124
a BBdEE---	----	1	0	0	----	3	5	8	----	6	16	50	----	18	120	526
a BbDEE---	----	1	0	0	----	3	5	8	----	6	16	50	----	18	120	526
a BbDEE---	----	1	0	0	----	3	5	8	----	6	16	50	----	18	120	526
A BbDEE---	----	45	51	48	----	206	632	1,759	----	226	961	5,061	----	1,058	9,626	70,101
A BbDEE---	----	45	51	48	----	206	632	1,759	----	226	961	5,061	----	1,058	9,626	70,101
A BbDEE---	----	45	51	48	----	206	632	1,759	----	226	961	5,061	----	1,058	9,626	70,101
a BbDEE---	----	0	1	0	----	1	7	23	----	3	21	137	----	9	166	1,560
a BbDEE---	----	0	1	0	----	1	7	23	----	3	21	137	----	9	166	1,560
a BbDEE---	----	0	1	0	----	1	7	23	----	3	21	137	----	9	166	1,560
a BbDEE---	----	0	1	0	----	1	7	23	----	3	21	137	----	9	166	1,560
a BbDEE---	----	0	1	0	----	1	7	23	----	3	21	137	----	9	166	1,560
a BbDEE---	----	0	1	0	----	1	7	23	----	3	21	137	----	9	166	1,560
a BbDEE---	----	0	1	0	----	1	7	23	----	3	21	137	----	9	166	1,560
a BbDEE---	497	152	49	19	995	662	565	686	994	773	969	390	1,990	3,394	8,858	29,854
a BbDEE---	----	0	1	1	----	1	10	76	----	1	30	412	----	4	238	4,918
a BbDEE---	----	0	1	1	----	1	10	76	----	1	30	412	----	4	238	4,918
a BbDEE---	----	0	1	1	----	1	10	76	----	1	30	412	----	4	238	4,918
A BbDEE---	----	44	143	294	----	206	1,812	10,963	----	225	2,638	28,243	----	1,053	27,220	41,411
a BbDEE---	----	133	121	103	----	618	1,486	3,789	----	676	2,276	10,940	----	3,164	22,618	150,861
a BbDEE---	----	133	121	103	----	618	1,486	3,789	----	676	2,276	10,940	----	3,164	22,618	150,861
a BbDEE---	----	133	121	103	----	618	1,486	3,789	----	676	2,276	10,940	----	3,164	22,618	150,861
a BbDEE---	----	133	336	633	----	617	4,235	23,534	----	674	6,178	60,722	----	3,155	63,588	888,475
a BbDEE---	----	133	336	633	----	617	4,235	23,534	----	674	6,178	60,722	----	3,155	63,588	888,475
a BbDEE---	----	133	336	633	----	617	4,235	23,534	----	674	6,178	60,722	----	3,155	63,588	888,475
a BbDEE---	9,850	21,178	38,809	73,759	39,401	130,957	443,405	1,823,495	19,700	71,678	316,004	2,225,268	78,802	502,345	4,153,020	39,942,048
Total----	10,870	22,518	40,605	76,459	41,416	137,075	465,776	1,923,866	21,741	78,530	349,646	2,492,301	82,832	533,756	4,492,413	43,789,456

Table 15.—Interpretations and transcriptions used to derive tables 16-27 from tables 4-14

Inheritance of conditional lethal trait		Genotypes of --		Survivors	Transcriptions and tables used to obtain number of survivors in tables 16-27
Trait 1	Trait 2	Native strain	Release strain		
1 dom. auto.	---	aa	AA	aa	None, use tables 3 and 9 directly.
2 auto. (3,4)	---	AaBb	aabb	AaBb, AaBb, AaBb	None, use tables 4 and 10 to obtain table 16.
2 auto. (5,6)	---	AaBb	aabb	AaBbD, AaBbD, AaBbD, AaBbD	Do.
3 auto. (6-8)	---	AaBbD	aabbD	AaBbD, AaBbD, AaBbD, AaBbD	None, use tables 5 and 11 to obtain table 17.
4 auto. (7,8)	---	AaBbD	aabbD	AaBbD, AaBbD, AaBbD, AaBbD	Do.
4 auto. (6-8)	---	AaBbD	aabbD	AaBbD, AaBbD, AaBbD, AaBbD	None, use tables 6 and 12 to obtain table 18.
3 auto. + 1 s.l. (6-9)	---	AaBbD	aabbD	Male AaBbD, AaBbD, AaBbD, AaBbD, etc., and corresponding female genotypes	None, use tables 7, 8, 13, and 14 to obtain table 19.
1 dom. auto.	1 dom. auto.	aabb	AaBb	aabbD, aabbD, aabbD	a to A and b to B in tables 4 and 10 to obtain table 20.
1 dom. auto.	2 auto. (3,4)	aabbD	AaBbD	aabbD, aabbD, aabbD	a to A in tables 5 and 11 to obtain table 21.
1 dom. auto.	3 auto. (4-6)	AaBbD	AaBbD	AaBbD, AaBbD, AaBbD, AaBbD, etc.	a to A in tables 6 and 12 to obtain table 22.
2 auto. (3,4)	---	AaBbD	aabbD	AaBbD, AaBbD, AaBbD, AaBbD, etc.	None, use tables 6 and 12 to obtain table 23.
1 dom. s.l.	3 auto. (4-6)	aabbD	AaBbD	aabbD, aabbD, aabbD, aabbD, etc., and corresponding female genotypes	a to A in tables 7, 8, 13, and 14 to obtain table 24.
1 dom. auto.	1 dom. auto.	aabbD	AaBbD	aabbD, aabbD, aabbD	a to A and b to B and d to D in tables 5 and 11 to obtain table 25.
1 dom. auto.	1 dom. auto.	aabbD	AaBbD	aabbD, aabbD, aabbD	a to A and b to B in tables 6 and 12 to obtain table 26.
1 dom. s.l.	1 dom. auto.	aabbD	AaBbD	aabbD, aabbD, aabbD, etc., and corresponding female genotypes	a to A and b to B in tables 7, 8, 13, and 14 to obtain table 27.

Table 16.--Numbers in each generation in which conditional lethal traits cannot be expressed when native population of 2,000 insects (AABB) was overflooded in parental, F_1 , F_2 , and F_3 generations by partially sterile insects (aabb) with 1 conditional lethal trait

Number released	Sterility	Rate of increase	Generation	No offspring from matings between partially sterile insects			Proportionate offspring from matings between partially sterile insects		
				4 dom. alleles	3,4 dom. alleles	Total	4 dom. alleles	3,4 dom. alleles	Total
Percent									
198,000--	90	Fivefold---	F_1	100	100	2,080	100	100	11,881
			F_2	9	39	2,167	8	36	23,911
			F_3	1	9	2,261	1	13	43,048
			F_4	0	2	2,362	0	8	81,937
198,000--	80	---do---	F_1	100	100	4,060	100	100	43,264
			F_2	29	135	8,361	25	115	142,302
			F_3	10	110	17,747	14	164	486,161
			F_4	4	92	39,874	14	348	2,020,164
198,000--	90	Tenfold---	F_1	200	200	4,160	200	200	23,762
			F_2	70	304	9,006	64	276	85,569
			F_3	33	313	21,145	57	599	391,547
			F_4	25	409	58,609	123	2,539	2,870,101
198,000--	80	---do---	F_1	200	200	8,120	200	200	86,528
			F_2	231	1,069	34,589	167	773	559,111
			F_3	373	3,761	168,148	384	3,994	4,734,508
			F_4	1,219	18,727	1,135,905	1,031	23,577	46,207,951
396,000--	90	Fivefold---	F_1	50	50	2,040	50	50	21,740
			F_2	4	18	2,082	4	18	45,037
			F_3	0	2	2,125	1	7	81,212
			F_4	0	0	2,172	0	2	152,918
396,000--	80	---do---	F_1	50	50	4,030	50	50	82,832
			F_2	14	66	8,182	11	55	274,150
			F_3	4	48	16,862	6	74	931,555
			F_4	1	33	35,787	6	152	3,847,779
396,000--	90	Tenfold---	F_1	100	100	4,080	100	100	43,482
			F_2	30	138	8,493	27	127	157,062
			F_3	11	117	18,416	21	247	699,296
			F_4	5	103	43,372	39	945	4,984,668
396,000--	90	---do---	F_1	100	100	8,060	100	100	165,664
			F_2	108	520	33,206	78	374	1,067,517
			F_3	141	1,579	148,237	151	1,833	8,984,915
			F_4	313	6,065	835,211	406	10,380	87,580,148

Table 17.--Numbers in each generation in which conditional lethal traits cannot be expressed when native population of 2,000 insects (AABBDD) was overflooded in parental, F_1 , F_2 , and F_3 generations by partially sterile insects (aabbdd) with 1 conditional lethal trait

Number released	Sterility	Rate of increase	Generation	No offspring from matings between partially sterile insects			Proportionate offspring from matings between partially sterile insects		
				5,6 dom. alleles	4-6 dom. alleles	Total	5,6 dom. alleles	4-6 dom. alleles	Total
<u>Percent</u>									
198,000--	90	Fivefold---	F_1	100	100	2,080	100	100	11,881
			F_2	16	42	2,166	15	41	23,911
			F_3	1	7	2,260	2	12	43,050
			F_4	0	1	2,362	0	4	81,936
198,000--	80	--do--	F_1	100	100	4,060	100	100	43,264
			F_2	52	151	8,365	44	119	142,301
			F_3	14	90	17,747	20	132	486,161
			F_4	4	51	39,873	12	174	2,020,176
198,000--	90	Tenfold---	F_1	200	200	4,160	200	200	23,762
			F_2	126	337	9,005	114	307	85,571
			F_3	50	276	21,144	83	507	391,548
			F_4	29	269	58,607	124	1,442	2,870,116
198,000--	80	--do--	F_1	200	200	8,120	200	200	86,528
			F_2	412	1,183	34,399	298	851	559,111
			F_3	551	3,238	168,148	474	3,196	4,734,505
			F_4	1,483	12,901	1,135,912	939	12,326	46,207,856
396,000--	90	Fivefold--	F_1	50	50	2,040	50	50	21,740
			F_2	7	19	2,082	6	18	45,036
			F_3	0	3	2,126	1	5	81,210
			F_4	0	0	2,171	0	0	152,920
396,000--	80	--do--	F_1	50	50	4,030	50	50	82,832
			F_2	24	72	8,182	20	61	274,150
			F_3	5	38	16,861	8	58	931,557
			F_4	1	16	35,788	4	70	3,847,777
396,000--	90	Tenfold--	F_1	101	101	4,081	101	101	43,482
			F_2	54	154	8,494	49	140	157,060
			F_3	15	95	18,414	29	197	699,296
			F_4	5	58	43,374	34	472	4,984,654
396,000--	80	--do--	F_1	101	101	8,060	101	101	165,663
			F_2	192	574	33,206	138	413	1,067,514
			F_3	193	1,089	148,237	194	1,423	8,984,898
			F_4	326	3,589	835,208	326	4,922	87,579,904

Table 18.--Numbers in each generation in which conditional lethal traits cannot be expressed when native population of 2,000 insects (AABBDEE) was overflooded in parental, F₁, F₂, and F₃ generations by partially sterile insects (aabbdee) with 1 conditional lethal trait

Number released	Sterility	Rate of increase	Generation	No offspring from matings between partially sterile insects			Proportionate offspring from matings between partially sterile insects		
				7,8 dom. alleles	6-8 dom. alleles	Total	7,8 dom. alleles	6-8 dom. alleles	Total
<u>Percent</u>									
198,000--	30	Fivefold---	F ₁	100	100	2,080	100	100	11,881
			F ₂	7	21	2,166	6	20	23,911
			F ₃	0	1	2,260	0	2	43,050
			F ₄	0	0	2,362	0	0	81,935
198,000--	30	--do--	F ₁	100	100	4,060	100	100	43,264
			F ₂	20	70	8,365	17	59	142,301
			F ₃	2	15	17,747	2	70	486,159
			F ₄	0	3	39,873	1	8	2,020,161
198,000--	30	Tenfold---	F ₁	200	200	4,160	200	200	23,762
			F ₂	54	168	9,005	50	153	85,571
			F ₃	9	59	21,143	13	92	391,545
			F ₄	2	22	58,606	8	100	2,870,090
198,000--	80	--do--	F ₁	200	200	8,120	200	200	86,528
			F ₂	158	548	24,399	114	397	559,110
			F ₃	93	626	168,147	62	499	4,734,500
			F ₄	157	1,415	1,135,904	44	688	46,207,866
196,000--	9	Fivefold---	F ₁	50	50	2,040	50	50	21,741
			F ₂	3	9	2,082	2	9	45,036
			F ₃	0	0	2,126	0	1	81,209
			F ₄	0	0	2,171	0	0	152,919
196,000--	8	--do--	F ₁	50	50	4,030	50	50	82,832
			F ₂	9	32	8,182	7	27	274,150
			F ₃	1	5	16,861	1	8	931,556
			F ₄	0	1	35,788	0	2	3,847,774
190,000--	90	Tenfold---	F ₁	101	101	4,080	101	101	43,482
			F ₂	20	71	8,494	19	65	157,060
			F ₃	2	16	18,414	4	30	699,296
			F ₄	0	3	43,374	1	21	4,984,656
196,000--	80	--do--	F ₁	101	101	8,060	101	101	165,664
			F ₂	68	254	33,206	49	183	1,067,514
			F ₃	24	202	148,238	21	192	8,984,906
			F ₄	17	224	935,210	12	209	87,580,048

Table 19.--Numbers in each generation in which conditional lethal traits cannot be expressed when native population of 2,000 insects (3 autosomal genes B:DDEE plus 1 sex-linked gene AA; female is heterogametic) was overflooded in parental, F₁, F₂, and F₃ generations by partially sterile insects (aabbdee, a-bbdee) with 1 conditional lethal trait

Number released	Sterility	Rate of increase	Generation	No offspring from matings between partially sterile insects			Proportionate offspring from matings between partially sterile insects		
				Males	Females	Total	Males	Females	Total
<u>Percent</u>									
198,000--	90	Fivefold---	F ₁	1,040	545	2,080	1,040	545	11,880
			F ₂	139	76	2,166	186	99	23,910
			F ₃	13	7	2,322	39	15	43,050
			F ₄	2	1	2,772	7	4	81,934
198,000--	80	--do--	F ₁	2,030	1,040	4,060	2,030	1,040	43,264
			F ₂	460	252	8,364	663	347	142,300
			F ₃	156	84	18,214	362	190	486,156
			F ₄	70	42	45,974	350	184	2,020,142
198,000--	90	Tenfold---	F ₁	2,080	1,090	4,160	2,080	1,090	23,762
			F ₂	689	382	9,004	1,014	548	85,572
			F ₃	390	218	21,610	1,027	550	391,542
			F ₄	342	190	65,288	2,342	1,230	2,870,044
198,000--	80	--do--	F ₁	4,060	2,080	8,120	4,060	2,080	86,528
			F ₂	2,209	1,242	34,400	3,515	1,855	559,110
			F ₃	3,833	2,144	171,406	6,915	3,595	4,734,478
			F ₄	14,649	7,997	1,206,836	20,800	4,849	46,207,232
196,000--	90	Fivefold---	F ₁	1,020	522	2,040	1,020	522	21,740
			F ₂	92	51	2,082	129	67	45,036
			F ₃	8	4	2,188	19	10	81,210
			F ₄	1	0	2,582	4	2	152,918
196,000--	80	--do--	F ₁	2,015	1,020	4,030	2,015	1,020	82,832
			F ₂	355	183	8,182	539	274	274,150
			F ₃	79	46	17,344	249	121	931,552
			F ₄	26	15	42,124	188	95	3,847,732
196,000--	90	Tenfold---	F ₁	2,040	1,045	4,080	2,040	1,045	43,482
			F ₂	467	242	8,494	724	381	157,060
			F ₃	164	92	18,898	539	286	699,292
			F ₄	80	44	50,022	925	485	4,984,602
196,000--	80	--do--	F ₁	4,030	2,040	8,060	4,030	2,040	165,664
			F ₂	1,592	862	33,206	2,826	1,461	1,067,512
			F ₃	1,759	961	151,844	4,330	2,256	8,984,826
			F ₄	2,880	2,356	921,802	10,229	5,290	87,578,912

Table 20.--Numbers in each generation in which conditional lethal traits cannot be expressed when native population of 2,000 insects (aabb) was overflooded in parental, F₁, F₂, and F₃ generations by partially sterile insects (AABB) with 2 conditional lethal traits

Number released	Sterility	Rate of increase	Generation	No offspring from matings between partially sterile insects		Proportionate offspring from matings between partially sterile insects	
				Survivors	Total offspring	Survivors	Total offspring
198,000--	90	Fivefold---	$\left\{ \begin{array}{l} F_1 \\ F_2 \\ F_3 \\ F_4 \end{array} \right.$	100	2,080	100	11,881
			$\left\{ \begin{array}{l} F_2 \\ F_3 \\ F_4 \end{array} \right.$	9	2,167	8	23,911
			$\left\{ \begin{array}{l} F_3 \\ F_4 \end{array} \right.$	1	2,261	1	43,048
			$\left\{ \begin{array}{l} F_4 \end{array} \right.$	0	2,362	0	84,979
198,000--	80	--do--	$\left\{ \begin{array}{l} F_1 \\ F_2 \\ F_3 \\ F_4 \end{array} \right.$	100	4,060	100	43,264
			$\left\{ \begin{array}{l} F_2 \\ F_3 \\ F_4 \end{array} \right.$	29	8,361	25	142,302
			$\left\{ \begin{array}{l} F_3 \\ F_4 \end{array} \right.$	10	17,747	14	486,161
			$\left\{ \begin{array}{l} F_4 \end{array} \right.$	4	39,874	14	2,020,164
198,000--	90	Tenfold---	$\left\{ \begin{array}{l} F_1 \\ F_2 \\ F_3 \\ F_4 \end{array} \right.$	200	4,160	200	23,762
			$\left\{ \begin{array}{l} F_2 \\ F_3 \\ F_4 \end{array} \right.$	70	9,006	64	85,569
			$\left\{ \begin{array}{l} F_3 \\ F_4 \end{array} \right.$	33	21,145	57	391,547
			$\left\{ \begin{array}{l} F_4 \end{array} \right.$	25	58,609	123	2,870,101
198,000--	80	--do--	$\left\{ \begin{array}{l} F_1 \\ F_2 \\ F_3 \\ F_4 \end{array} \right.$	200	8,120	200	86,528
			$\left\{ \begin{array}{l} F_2 \\ F_3 \\ F_4 \end{array} \right.$	230	34,589	167	559,111
			$\left\{ \begin{array}{l} F_3 \\ F_4 \end{array} \right.$	373	168,148	384	4,734,508
			$\left\{ \begin{array}{l} F_4 \end{array} \right.$	1,219	1,135,905	1031	46,207,951
396,000--	90	Fivefold---	$\left\{ \begin{array}{l} F_1 \\ F_2 \\ F_3 \\ F_4 \end{array} \right.$	50	2,040	50	21,740
			$\left\{ \begin{array}{l} F_2 \\ F_3 \\ F_4 \end{array} \right.$	4	2,082	4	45,037
			$\left\{ \begin{array}{l} F_3 \\ F_4 \end{array} \right.$	0	2,125	0	81,212
			$\left\{ \begin{array}{l} F_4 \end{array} \right.$	0	2,172	0	152,918
396,000--	80	--do--	$\left\{ \begin{array}{l} F_1 \\ F_2 \\ F_3 \\ F_4 \end{array} \right.$	50	4,030	50	82,832
			$\left\{ \begin{array}{l} F_2 \\ F_3 \\ F_4 \end{array} \right.$	14	8,182	11	274,150
			$\left\{ \begin{array}{l} F_3 \\ F_4 \end{array} \right.$	4	16,862	6	931,555
			$\left\{ \begin{array}{l} F_4 \end{array} \right.$	1	35,787	6	3,847,779
396,000--	90	Tenfold---	$\left\{ \begin{array}{l} F_1 \\ F_2 \\ F_3 \\ F_4 \end{array} \right.$	100	4,080	100	43,482
			$\left\{ \begin{array}{l} F_2 \\ F_3 \\ F_4 \end{array} \right.$	30	8,493	27	157,062
			$\left\{ \begin{array}{l} F_3 \\ F_4 \end{array} \right.$	11	18,416	21	699,296
			$\left\{ \begin{array}{l} F_4 \end{array} \right.$	5	43,372	39	4,984,668
396,000--	80	--do--	$\left\{ \begin{array}{l} F_1 \\ F_2 \\ F_3 \\ F_4 \end{array} \right.$	100	8,060	100	165,664
			$\left\{ \begin{array}{l} F_2 \\ F_3 \\ F_4 \end{array} \right.$	108	33,206	78	1,067,517
			$\left\{ \begin{array}{l} F_3 \\ F_4 \end{array} \right.$	141	148,237	151	8,984,915
			$\left\{ \begin{array}{l} F_4 \end{array} \right.$	313	835,211	406	87,580,148

Table 21.--Numbers in each generation in which conditional lethal traits cannot be expressed when native population of 2,000 insects (aaBBDD) was overflooded in parental, F₁, F₂, and F₃ generations by partially sterile insects (AAbbdd) with 2 conditional lethal traits

Number released	Sterility	Rate of increase	Generation	No offspring from matings between partially sterile insects		Proportionate offspring from matings between partially sterile insects	
				Survivors	Total offspring	Survivors	Total offspring
198,000--	90	Fivefold---	$\left\{ \begin{array}{l} F_1 \\ F_2 \\ F_3 \\ F_4 \end{array} \right.$	100	2,080	100	11,881
			$\left\{ \begin{array}{l} F_2 \\ F_3 \\ F_4 \end{array} \right.$	12	2,166	11	23,911
			$\left\{ \begin{array}{l} F_3 \\ F_4 \end{array} \right.$	1	2,260	1	43,050
			$\left\{ \begin{array}{l} F_4 \end{array} \right.$	0	2,362	0	81,936
198,000--	80	--do--	$\left\{ \begin{array}{l} F_1 \\ F_2 \\ F_3 \\ F_4 \end{array} \right.$	100	4,060	100	43,264
			$\left\{ \begin{array}{l} F_2 \\ F_3 \\ F_4 \end{array} \right.$	38	8,365	32	142,301
			$\left\{ \begin{array}{l} F_3 \\ F_4 \end{array} \right.$	10	17,747	13	486,161
			$\left\{ \begin{array}{l} F_4 \end{array} \right.$	3	39,873	8	2,020,176
198,000--	90	Tenfold---	$\left\{ \begin{array}{l} F_1 \\ F_2 \\ F_3 \\ F_4 \end{array} \right.$	200	4,160	200	23,762
			$\left\{ \begin{array}{l} F_2 \\ F_3 \\ F_4 \end{array} \right.$	92	9,005	84	85,571
			$\left\{ \begin{array}{l} F_3 \\ F_4 \end{array} \right.$	35	21,144	58	391,548
			$\left\{ \begin{array}{l} F_4 \end{array} \right.$	20	58,607	84	2,870,116
198,000--	80	--do--	$\left\{ \begin{array}{l} F_1 \\ F_2 \\ F_3 \\ F_4 \end{array} \right.$	200	8,120	200	86,528
			$\left\{ \begin{array}{l} F_2 \\ F_3 \\ F_4 \end{array} \right.$	297	34,399	215	559,111
			$\left\{ \begin{array}{l} F_3 \\ F_4 \end{array} \right.$	382	168,148	326	4,734,505
			$\left\{ \begin{array}{l} F_4 \end{array} \right.$	1,015	1,135,912	642	46,207,856
396,000--	90	Fivefold---	$\left\{ \begin{array}{l} F_1 \\ F_2 \\ F_3 \\ F_4 \end{array} \right.$	50	2,040	50	21,740
			$\left\{ \begin{array}{l} F_2 \\ F_3 \\ F_4 \end{array} \right.$	5	2,082	5	45,036
			$\left\{ \begin{array}{l} F_3 \\ F_4 \end{array} \right.$	0	2,126	0	81,210
			$\left\{ \begin{array}{l} F_4 \end{array} \right.$	0	2,171	0	152,920
396,000--	80	--do--	$\left\{ \begin{array}{l} F_1 \\ F_2 \\ F_3 \\ F_4 \end{array} \right.$	50	4,030	50	82,832
			$\left\{ \begin{array}{l} F_2 \\ F_3 \\ F_4 \end{array} \right.$	17	8,182	15	274,150
			$\left\{ \begin{array}{l} F_3 \\ F_4 \end{array} \right.$	4	16,861	5	931,557
			$\left\{ \begin{array}{l} F_4 \end{array} \right.$	1	35,788	3	3,847,777
396,000--	90	Tenfold---	$\left\{ \begin{array}{l} F_1 \\ F_2 \\ F_3 \\ F_4 \end{array} \right.$	101	4,081	101	43,482
			$\left\{ \begin{array}{l} F_2 \\ F_3 \\ F_4 \end{array} \right.$	39	8,494	35	157,060
			$\left\{ \begin{array}{l} F_3 \\ F_4 \end{array} \right.$	10	18,414	20	699,296
			$\left\{ \begin{array}{l} F_4 \end{array} \right.$	3	43,374	23	4,984,654
396,000--	80	--do--	$\left\{ \begin{array}{l} F_1 \\ F_2 \\ F_3 \\ F_4 \end{array} \right.$	101	8,060	101	165,663
			$\left\{ \begin{array}{l} F_2 \\ F_3 \\ F_4 \end{array} \right.$	138	33,206	99	1,067,514
			$\left\{ \begin{array}{l} F_3 \\ F_4 \end{array} \right.$	133	148,237	133	8,984,898
			$\left\{ \begin{array}{l} F_4 \end{array} \right.$	222	835,208	220	87,579,904

Table 22.--Numbers in each generation in which conditional lethal traits cannot be expressed when native population of 2,000 insects (aaBBDDEE) was overflooded in parental, F_1 , F_2 , and F_3 generations by partially sterile insects (AaBbddee) with 2 conditional lethal traits

Number released	Sterility	Rate of increase	Generation	No offspring from matings between partially sterile insects		Proportionate offspring from matings between partially sterile insects	
				Survivors	Total offspring	Survivors	Total offspring
	Percent						
198,000--	90	Fivefold---	F_1	100	2,080	100	11,881
			F_2	10	2,166	10	23,911
			F_3	0	2,260	0	43,050
			F_4	0	2,362	0	81,935
198,000--	80	--do--	F_1	100	4,060	100	43,264
			F_2	42	8,365	36	142,301
			F_3	6	17,747	13	486,159
			F_4	0	39,873	3	2,020,161
198,000--	90	Tenfold---	F_1	200	4,160	200	23,762
			F_2	103	9,005	96	85,571
			F_3	31	21,143	52	391,545
			F_4	18	58,606	57	2,870,090
198,000--	80	--do--	F_1	200	8,120	200	86,528
			F_2	329	34,399	239	559,110
			F_3	352	168,147	280	4,734,500
			F_4	784	1,135,904	376	46,207,866
396,000--	90	Fivefold---	F_1	50	2,040	50	21,741
			F_2	6	2,082	6	45,036
			F_3	0	2,126	0	81,209
			F_4	0	2,171	0	152,919
396,000--	80	--do--	F_1	50	4,030	101	82,832
			F_2	19	8,182	19	274,150
			F_3	3	16,861	3	931,556
			F_4	0	35,788	0	3,847,774
396,000--	90	Tenfold---	F_1	101	4,080	101	43,481
			F_2	48	8,494	39	157,060
			F_3	6	18,414	18	699,296
			F_4	3	43,374	12	4,984,656
396,000--	80	--do--	F_1	101	8,060	101	165,664
			F_2	153	33,206	51	1,067,514
			F_3	116	148,238	34	8,984,906
			F_4	148	835,210	33	87,580,048

Table 23.--Numbers in each generation in which conditional lethal traits cannot be expressed when native population of 2,000 insects (AABBDDEE) was overflooded in parental, F_1 , F_2 , and F_3 generations by partially sterile insects (AaBbddee) with 2 conditional lethal traits

Number released	Sterility	Rate of increase	Generation	No offspring from matings between partially sterile insects		Proportionate offspring from matings between partially sterile insects	
				Survivors	Total offspring	Survivors	Total offspring
	Percent						
198,000--	90	Fivefold---	F_1	100	2,080	100	11,881
			F_2	13	2,166	13	23,911
			F_3	0	2,260	0	43,050
			F_4	0	2,362	0	81,935
198,000--	80	--do--	F_1	100	4,060	100	43,264
			F_2	43	8,365	43	142,301
			F_3	8	17,747	16	486,159
			F_4	0	39,873	4	2,020,161
198,000--	90	Tenfold---	F_1	200	4,160	200	23,762
			F_2	122	9,005	113	85,571
			F_3	37	21,143	58	391,545
			F_4	20	58,606	64	2,870,090
198,000--	80	--do--	F_1	200	8,120	200	86,528
			F_2	383	34,399	277	559,110
			F_3	403	168,147	316	4,734,500
			F_4	883	1,135,904	421	46,207,866
396,000--	90	Fivefold---	F_1	50	2,040	50	21,741
			F_2	8	2,082	8	45,036
			F_3	0	2,126	0	81,209
			F_4	0	2,171	0	152,919
396,000--	80	--do--	F_1	50	4,030	50	82,832
			F_2	21	8,182	21	274,150
			F_3	4	16,861	4	931,556
			F_4	0	35,788	0	3,847,774
396,000--	90	Tenfold---	F_1	101	4,080	101	43,481
			F_2	43	8,494	47	157,060
			F_3	8	18,414	20	699,296
			F_4	4	43,374	12	4,984,656
396,000--	80	--do--	F_1	101	8,060	101	165,664
			F_2	177	33,206	126	1,067,514
			F_3	130	148,238	121	8,984,906
			F_4	165	835,210	128	87,580,048

Table 24.--Numbers in each generation in which conditional lethal traits cannot be expressed when native population of 2,000 insects (3 autosomal genes BBDEE plus 1 sex-linked gene aa; female is heterogametic) was overflooded in parental, F₁, F₂, and F₃ generations by partially sterile insects (AABbdee, A-bbdee) with 2 conditional lethal traits

Number released	Sterility	Rate of increase	Generation	No offspring from matings between partially sterile insects			Proportionate offspring from matings between partially sterile insects		
				Males	Females	Total	Males	Females	Total
	Percent								
198,000--	90	Fivefold--	F ₁	50	50	2,080	50	50	11,880
			F ₂	7	10	2,166	7	10	23,910
			F ₃	0	0	2,322	0	0	43,050
			F ₄	0	0	2,772	0	0	81,934
198,000--	80	--do--	F ₁	50	50	4,060	50	50	43,264
			F ₂	22	42	8,364	19	32	142,300
			F ₃	3	15	18,214	3	18	486,156
			F ₄	0	3	45,974	3	15	2,020,142
198,000--	90	Tenfold---	F ₁	100	100	4,160	100	100	23,762
			F ₂	53	95	9,004	44	85	85,572
			F ₃	19	49	21,610	27	82	391,542
			F ₄	6	33	65,288	27	139	2,870,044
198,000--	80	--do--	F ₁	100	100	8,120	100	100	86,528
			F ₂	168	314	34,400	119	228	559,110
			F ₃	178	537	171,406	140	408	4,734,478
			F ₄	391	1,590	1,206,836	187	1,093	46,207,232
396,000--	90	Fivefold--	F ₁	25	25	2,040	25	25	21,740
			F ₂	0	6	2,082	0	3	45,036
			F ₃	0	0	2,188	0	0	81,210
			F ₄	0	0	2,582	0	0	152,918
396,000--	80	--do--	F ₁	25	25	4,030	25	25	82,832
			F ₂	10	19	8,182	6	16	274,150
			F ₃	0	3	17,344	0	6	931,552
			F ₄	0	0	42,124	0	3	3,847,732
396,000--	90	Tenfold---	F ₁	50	50	4,080	50	50	43,482
			F ₂	23	42	8,494	19	35	157,060
			F ₃	3	15	18,898	6	27	699,292
			F ₄	0	3	50,022	6	39	4,984,602
396,000--	80	--do--	F ₁	50	50	8,060	50	50	165,664
			F ₂	73	146	33,206	54	105	1,067,512
			F ₃	58	191	151,844	52	197	8,984,826
			F ₄	75	368	921,802	54	379	87,578,912

Table 25.--Numbers in each generation in which conditional lethal traits cannot be expressed when native population of 2,000 insects (aabbdd) was overflooded in parental, F₁, F₂, and F₃ generations by partially sterile insects (AABbDD) with 3 conditional lethal traits

Number released	Sterility	Rate of increase	Generation	No offspring from matings between partially sterile insects		Proportionate offspring from matings between partially sterile insects	
				Survivors	Total offspring	Survivors	Total offspring
	Percent						
198,000--	90	Fivefold---	F ₁	100	2,080	100	11,881
			F ₂	3	2,166	3	23,911
			F ₃	0	2,260	0	43,050
			F ₄	0	2,362	0	81,936
198,000--	80	--do--	F ₁	100	4,060	100	43,264
			F ₂	9	8,365	7	142,301
			F ₃	1	17,747	1	486,161
			F ₄	0	39,873	0	2,020,176
198,000--	90	Tenfold---	F ₁	200	4,160	200	23,762
			F ₂	24	9,005	22	85,571
			F ₃	4	21,144	6	391,548
			F ₄	2	58,607	5	2,870,116
198,000--	80	--do--	F ₁	200	8,120	200	86,528
			F ₂	69	34,399	50	559,111
			F ₃	45	168,148	32	4,734,505
			F ₄	81	1,135,912	33	46,207,856
396,000--	90	Fivefold---	F ₁	50	2,040	50	21,740
			F ₂	1	2,082	1	45,036
			F ₃	0	2,126	0	81,210
			F ₄	0	2,171	0	152,920
396,000--	80	--do--	F ₁	50	4,030	50	82,832
			F ₂	4	8,182	3	274,150
			F ₃	0	16,861	0	931,557
			F ₄	0	35,788	0	3,847,777
396,000--	90	Tenfold---	F ₁	101	4,081	101	43,482
			F ₂	9	8,494	8	157,060
			F ₃	1	18,414	2	699,296
			F ₄	0	43,374	1	4,984,654
396,000--	80	--do--	F ₁	101	8,060	101	165,663
			F ₂	30	33,206	21	1,067,514
			F ₃	13	148,237	12	8,984,898
			F ₄	14	835,208	10	87,579,904

Table 26.--Numbers in each generation in which conditional lethal traits cannot be expressed when native population of 2,000 insects (aabbDDEE) was overflooded in parental, F_1 , F_2 , and F_3 generations by partially sterile insects (AABbDdee) with 3 conditional lethal traits

Number released	Sterility	Rate of increase	Generation	No offspring from matings between partially sterile insects		Proportionate offspring from matings between partially sterile insects	
				Survivors	Total offspring	Survivors	Total offspring
	Percent						
198,000--	90	Fivefold---	F_1	100	2,080	100	11,881
			F_2	3	2,166	3	23,911
			F_3	0	2,260	0	43,050
			F_4	0	2,362	0	81,935
198,000--	80	--do--	F_1	100	4,060	100	43,264
			F_2	11	8,365	11	142,301
			F_3	0	17,747	2	486,159
			F_4	0	39,873	0	2,020,161
198,000--	90	Tenfold---	F_1	200	4,160	200	23,762
			F_2	32	9,005	29	85,571
			F_3	5	21,143	7	391,545
			F_4	2	58,606	4	2,870,090
198,000--	80	--do--	F_1	200	8,120	200	86,528
			F_2	89	34,399	65	559,110
			F_3	49	168,147	32	4,734,500
			F_4	71	1,135,904	23	46,207,866
396,000--	90	Fivefold---	F_1	50	2,040	50	21,741
			F_2	2	2,082	2	45,036
			F_3	0	2,162	0	81,209
			F_4	0	2,171	0	152,919
396,000--	80	--do--	F_1	50	4,030	50	82,832
			F_2	5	8,182	5	274,150
			F_3	0	16,861	0	931,556
			F_4	0	35,788	0	3,847,774
396,000--	90	Tenfold---	F_1	101	4,080	101	43,481
			F_2	11	8,494	11	157,060
			F_3	0	18,414	2	699,296
			F_4	0	43,374	0	4,984,656
396,000--	80	--do--	F_1	101	8,060	101	165,664
			F_2	39	33,206	28	1,067,514
			F_3	14	148,238	11	8,984,906
			F_4	11	835,210	6	87,580,048

Table 27.--Numbers in each generation in which conditional lethal traits cannot be expressed when native population of 2,000 insects (3 autosomal genes bbbDDEE plus 1 sex-linked gene aa; female is heterogametic) was overflooded in parental, F_1 , F_2 , and F_3 generations by partially sterile insects (AABbDdee, A-BbDdee) with 3 conditional lethal traits

Number released	Sterility	Rate of increase	Generation	No offspring from matings between partially sterile insects			Proportionate offspring from matings between partially sterile insects		
				Males	Females	Total	Males	Females	Total
	Percent								
198,000--	90	Fivefold---	F_1	50	50	2,080	50	50	11,880
			F_2	3	3	2,166	3	3	23,910
			F_3	0	0	2,322	0	0	43,050
			F_4	0	0	2,772	0	0	81,934
198,000--	80	--do--	F_1	50	50	4,060	50	50	43,264
			F_2	5	11	8,364	5	8	142,300
			F_3	0	2	18,214	0	2	486,156
			F_4	0	0	45,974	0	0	2,020,142
198,000--	90	Tenfold---	F_1	100	100	4,160	100	100	23,762
			F_2	15	28	9,004	15	25	85,572
			F_3	2	7	21,610	4	9	391,542
			F_4	0	2	65,288	2	9	2,870,044
198,000--	80	--do--	F_1	100	100	8,120	100	100	86,528
			F_2	46	82	34,400	32	59	559,110
			F_3	26	69	171,406	16	52	4,734,478
			F_4	35	138	1,206,836	11	61	46,207,232
396,000--	90	Fivefold---	F_1	25	25	2,040	25	25	21,740
			F_2	0	2	2,082	0	0	45,036
			F_3	0	0	2,188	0	0	81,210
			F_4	0	0	2,582	0	0	152,918
396,000--	80	--do--	F_1	25	25	4,030	25	25	82,832
			F_2	3	5	8,182	2	3	274,150
			F_3	0	0	17,344	0	0	931,552
			F_4	0	0	42,124	0	0	3,847,732
396,000--	90	Tenfold---	F_1	50	50	4,080	50	50	43,482
			F_2	6	11	8,494	5	10	157,060
			F_3	0	2	18,898	0	2	699,292
			F_4	0	0	50,022	0	2	4,984,602
396,000--	80	--do--	F_1	50	50	8,060	50	50	165,664
			F_2	18	36	33,206	13	26	1,067,512
			F_3	7	20	151,844	5	20	8,984,826
			F_4	6	26	921,802	2	19	87,578,912

Table 28.--Complete suppression of native population (2,000 insects, 1:1 sex ratio) by overflooding parental, F₁, F₂, and F₃ generations with partially sterile release strain bearing conditional lethal traits. Complete suppression is assumed when number of insects with genotypes for survival is reduced to 30 or less

Inheritance of conditional lethal traits in release strain			No offspring from partially sterile insect matings when lethal traits expressed during--			Proportionate offspring from partially sterile insect matings when lethal traits expressed during--		
Trait 1	Trait 2	Trait 3	F ₂	F ₃	F ₄	F ₂	F ₃	F ₄
1 dom.auto.	--	--	1,5	1,5	1,5	1,5	1,5	1,5
2 auto.(4)	--	--	1,2,5,6,7	1,2,5,6,7	1,2,3,5,6,7	1,2,5,6,7	1,2,5,6,7	1,2,5,6
2 auto.(3,4)	--	--	5	1,5	1,5	5	1,5	1,5
3 auto.(5,6)	--	--	1,5,6	1,2,5,6,7	1,2,3,5,6,7	1,5,6	1,2,5,6,7	1,2,5,6
3 auto.(4-6)	--	--	5	1,5	1,5,6	5	1,5	1,5
4 auto.(7,8)	--	--	1,2,5,6,7	1,2,3,5,6, 7,8	1,2,3,5,6, 7,8	1,2,5,6,7	1,2,3,5,6, 7,8	1,2,3,5,6,7,8
4 auto.(6-8)	--	--	1,5	1,2,5,6,7	1,2,3,5,6,7	1,5,6	1,2,5,6,7	1,2,5,6,7
3 auto.+ 1 s.l.(6-9)	--	--	--	1,5	1,5	--	5	1,5
1 dom.auto.	1 dom.auto.	--	1,2,5,6,7	1,2,5,6,7	1,2,3,5,6,7	1,2,5,6,7	1,2,5,6	1,2,5,6
1 dom.auto.	2 auto.(3,4)	--	1,5,6	1,2,5,6,7	1,2,3,5,6,7	1,5,6	1,2,5,6,7	1,2,5,6,7
1 dom.auto.	3 auto.(4-6)	--	1,5,6	1,2,5,6,7	1,2,3,5,6,7	1,5,6	1,2,5,6,7	1,2,5,6,7
2 auto.(3,4)	2 auto.(3,4)	--	1,5,6	1,2,5,6,7	1,2,3,5,6,7	1,5,6	1,2,5,6,7	1,2,5,6,7
1 dom.s.l.	3 auto.(4-6)	--	1,5,6	1,2,5,6,7	1,2,5,6,7	1,5,6	1,2,5,6, 7(?) ^{1/}	1,2,5,6,7(?)
1 dom.auto.	1 dom.auto.	1 dom.auto.	1,2,3,5,6, 7,8	1,2,3,5,6, 7,8	1,2,3,5,6, 7,8	1,2,3,5,6, 7,8	1,2,3,5,6, 7,8	1,2,3,5,6,7,8
1 dom.auto.	1 dom.auto.	2 auto.(3,4)	1,2,3,5,6, 7,8	1,2,3,5,6, 7,8	1,2,3,5,6, 7,8	1,2,3,5,6, 7,8	1,2,3,5,6, 7,8	1,2,3,4,5,6,7, 8
1 dom.s.l.	1 dom.auto.	2 auto.(3,4)	1,2,3,5,6, 7,8	1,2,3,5,6, 7,8	1,2,3,5,6, 7,8	1,2,3,5,6, 7,8	1,2,3,5,6, 7,8	1,2,3,5,6,7,8

^{1/} (?) = case with slightly more than 30 survivors or with pronounced sex ratio distortion or with both.

Table 29.--Relative frequencies of genotypes when native population (aa) is overflooded once in parental generation by $\underline{X}$ release insects (AA) for every native insect

Genotype	F ₁	F ₂	F ₃	F ₄
$\underline{X} = 1$				
aa---	0.2500000	0.2500000	0.2500000	0.2500000
Aa---	.5000000	.5000000	.5000000	.5000000
AA---	.2500000	.2500000	.2500000	.2500000
$\underline{X} = 2$				
aa---	.1111111	.1111111	.1111111	.1111111
Aa---	.4444444	.4444444	.4444444	.4444444
AA---	.4444444	.4444444	.4444444	.4444444
$\underline{X} = 3$				
aa---	.0625000	.0625000	.0625000	.0625000
Aa---	.3750000	.3750000	.3750000	.3750000
AA---	.5625000	.5625000	.5625000	.5625000
$\underline{X} = 4$				
aa---	.0400000	.0400000	.0400000	.0400000
Aa---	.3200000	.3200000	.3200000	.3200000
AA---	.6400000	.6400000	.6400000	.6400000
$\underline{X} = 5$				
aa---	.0277777	.0277777	.0277777	.0277777
Aa---	.2777777	.2777777	.2777777	.2777777
AA---	.6944444	.6944444	.6944444	.6944444
$\underline{X} = 10$				
aa---	.0082645	.0082645	.0082645	.0082645
Aa---	.1652892	.1652892	.1652892	.1652892
AA---	.8264462	.8264462	.8264462	.8264462
$\underline{X} = 50$				
aa---	.0003845	.0003845	.0003845	.0003845
Aa---	.0384467	.0384467	.0384467	.0384467
AA---	.9611687	.9611687	.9611687	.9611687
$\underline{X} = 100$				
aa---	.0000980	.0000980	.0000980	.0000980
Aa---	.0196059	.0196059	.0196059	.0196059
AA---	.9802959	.9802959	.9802959	.9802959
$\underline{X} = 200$				
aa---	.0000248	.0000248	.0000248	.0000248
Aa---	.0099007	.0099007	.0099007	.0099007
AA---	.9900745	.9900745	.9900745	.9900745
$\underline{X} = 1,000$				
aa---	.0000010	.0000010	.0000010	.0000010
Aa---	.0019960	.0019960	.0019960	.0019960
AA---	.9980029	.9980029	.9980029	.9980029

Table 30.--Relative frequencies of genotypes when native population (AABB) is overflooded once in parental generation by $\bar{X}$ release insects (aabb) for every native insect

Generation	AABB	AaBB	AABb	AaBb	aaBB	AABb	aaBb	Aabb	aabb
$\bar{X} = 1$									
F ₁ ----	0.2500000	-----	-----	0.5000000	-----	-----	-----	-----	0.2500000
F ₂ ----	.1406250	0.0937500	0.0937500	.3125000	0.0156250	0.0156250	0.0937500	0.0937500	.1406250
F ₃ ----	.0965625	.1171875	.1171875	.2656250	.0351563	.0351563	.1171875	.1171875	.0976563
F ₄ ----	.0791016	.1230469	.1230469	.2539063	.0478516	.0478516	.1230469	.1230469	.0791016
$\bar{X} = 2$									
F ₁ ----	.1111111	-----	-----	.4444444	-----	-----	-----	-----	.4444444
F ₂ ----	.0493827	.0493827	.0493827	.2716049	.0123457	.0123457	.1234568	.1234568	.3086420
F ₃ ----	.0277778	.0555556	.0555556	.2222222	.0277778	.0277778	.1666667	.1666667	.2500000
F ₄ ----	.0192901	.0540123	.0540123	.2067901	.0378086	.0378086	.1836420	.1836420	.2229938
$\bar{X} = 3$									
F ₁ ----	.0625000	-----	-----	.3750000	-----	-----	-----	-----	.5625000
F ₂ ----	.0244141	.0292969	.0292969	.2226563	.0087891	.0087891	.1230469	.1230469	.4306641
F ₃ ----	.0119629	.0307617	.0307617	.1728516	.0197754	.0197754	.1713867	.1713867	.3713379
F ₄ ----	.0073853	.0281982	.0281982	.1545410	.0269165	.0269165	.1922607	.1922607	.3433228
$\bar{X} = 4$									
F ₁ ----	.0400000	-----	-----	.3200000	-----	-----	-----	-----	.6400000
F ₂ ----	.0144000	.0192000	.0192000	.1856000	.0064000	.0064000	.1152000	.1152000	.5184000
F ₃ ----	.0064000	.0192000	.0192000	.1376000	.0144000	.0144000	.1632000	.1632000	.4624000
F ₄ ----	.0036000	.0168000	.0168000	.1184000	.0196000	.0196000	.1848000	.1848000	.4356000
$\bar{X} = 5$									
F ₁ ----	.0277778	-----	-----	.2777778	-----	-----	-----	-----	.6944444
F ₂ ----	.0094522	.0135031	.0135031	.1581790	.0048225	.0048225	.1060957	.1060957	.5835262
F ₃ ----	.0039063	.0130208	.0130208	.1128472	.0108507	.0108507	.1519097	.1519097	.5316840
F ₄ ----	.0020375	.0109713	.0109713	.0937982	.0147690	.0147690	.1730083	.1730083	.5066671
$\bar{X} = 10$									
F ₁ ----	.0082645	-----	-----	.1652893	-----	-----	-----	-----	.8264463
F ₂ ----	.0024588	.0040908	.0040908	.0894748	.0017075	.0017075	.0717164	.0717164	.7530223
F ₃ ----	.0008367	.0035858	.0035858	.0566901	.0038420	.0038420	.1050133	.1050133	.7175910
F ₄ ----	.0003458	.0026894	.0026894	.0415784	.0052293	.0055932	.1210214	.1210214	.7001955
$\bar{X} = 50$									
F ₁ ----	.0003845	-----	-----	.0384468	-----	-----	-----	-----	.9611688
F ₂ ----	.0000999	.0001922	.0001922	.0195929	.0000924	.0000924	.0186617	.0186617	.9424147
F ₃ ----	.0000269	.0001497	.0001497	.0104431	.0002079	.0002079	.0278539	.0278539	.9331070
F ₄ ----	.0000078	.0000938	.0000938	.0059376	.0002829	.0002829	.0324154	.0324154	.9284704
$\bar{X} = 100$									
F ₁ ----	.0000980	-----	-----	.0196059	-----	-----	-----	-----	.9802960
F ₂ ----	.0000250	.0000490	.0000490	.0098991	.0000240	.0000240	.0096579	.0096579	.9706142
F ₃ ----	.0000065	.0000375	.0000375	.0051177	.0000541	.0000541	.0144507	.0144507	.9657913
F ₄ ----	.0000018	.0000227	.0000227	.0027450	.0000736	.0000736	.0168382	.0168382	.9633844
$\bar{X} = 200$									
F ₁ ----	.0000248	-----	-----	.0099007	-----	-----	-----	-----	.9900745
F ₂ ----	.0000062	.0000124	.0000124	.0049749	.0000061	.0000061	.0049135	.0049135	.9851549
F ₃ ----	.0000016	.0000094	.0000094	.0025303	.0000138	.0000138	.0073610	.0073610	.9826997
F ₄ ----	.0000004	.0000056	.0000056	.0013126	.0000188	.0000188	.0085825	.0085825	.9814732
$\bar{X} = 1,000$									
F ₁ ----	.0000010	-----	-----	.0019960	-----	-----	-----	-----	.9980030
F ₂ ----	.0000002	.0000005	.0000005	.0009990	.0000002	.0000002	.0009965	.0009965	.9970062
F ₃ ----	.0000001	.0000004	.0000004	.0005012	.0000006	.0000006	.0014944	.0014944	.9965080
F ₄ ----	.0000000	.0000002	.0000002	.0002526	.0000008	.0000008	.0017432	.0017432	.9962590

Table 31.--Relative frequencies of genotypes when native population (AABHND) is overflooded once in parental generation by X release insects (aabbdd) for every native insect

Genotype	$\bar{X} = 1$				$\bar{X} = 2$				$\bar{X} = 3$				$\bar{X} = 4$			
	F ₁	F ₂	f ₃	F ₄	F ₁	F ₂	F ₃	F ₄	F ₁	F ₂	F ₃	F ₄	F ₁	F ₂	F ₃	F ₄
AABBD----	0.250000	0.0976583	0.0478516	0.0295410	0.111111	0.0277778	0.0094521	0.0043522	0.0625000	0.0119629	0.0032082	0.0012019	0.4000000	0.0064000	0.0014400	0.0004622
AABBD-	-----	0.0390625	0.0410156	0.0375977	-----	0.0185185	0.0135030	0.0096209	-----	0.025239	0.0059738	0.0035548	-----	0.0064000	0.0031920	0.0016555
AABBD	-----	0.0390625	0.0410156	0.0375977	-----	0.0185185	0.0135030	0.0096209	-----	0.025239	0.0059738	0.0035548	-----	0.0064000	0.0031920	0.0016555
AABBD--	-----	0.0390625	0.0410156	0.0375977	-----	0.0185185	0.0135030	0.0096209	-----	0.025239	0.0059738	0.0035548	-----	0.0064000	0.0031920	0.0016555
AABBD-	-----	0.039063	0.0087891	0.0119629	-----	0.030864	0.0048225	0.0053168	-----	0.021973	0.0027809	0.0026286	-----	0.0016000	0.0017660	0.0014822
AABBD--	-----	0.039063	0.0087891	0.0119629	-----	0.030864	0.0048225	0.0053168	-----	0.021973	0.0027809	0.0026286	-----	0.0016000	0.0017660	0.0014822
AABBD	-----	0.039063	0.0087891	0.0119629	-----	0.030864	0.0048225	0.0053168	-----	0.021973	0.0027809	0.0026286	-----	0.0016000	0.0017660	0.0014822
AABBD--	-----	0.039063	0.0087891	0.0119629	-----	0.030864	0.0048225	0.0053168	-----	0.021973	0.0027809	0.0026286	-----	0.0016000	0.0017660	0.0014822
AABbd----	-----	0.068750	0.0585938	0.0615234	-----	0.0246914	0.0285492	0.0266882	-----	0.0146684	0.0155182	0.0130777	-----	0.0096000	0.0094559	0.0073289
AABbd-	-----	0.068750	0.0585938	0.0615234	-----	0.0246914	0.0285492	0.0266882	-----	0.0146684	0.0155182	0.0130777	-----	0.0096000	0.0094559	0.0073289
AABbd	-----	0.068750	0.0585938	0.0615234	-----	0.0246914	0.0285492	0.0266882	-----	0.0146684	0.0155182	0.0130777	-----	0.0096000	0.0094559	0.0073289
AABbd--	-----	0.068750	0.0585938	0.0615234	-----	0.0246914	0.0285492	0.0266882	-----	0.0146684	0.0155182	0.0130777	-----	0.0096000	0.0094559	0.0073289
AAbbd----	-----	0.078125	0.0175781	0.0239258	-----	0.061728	0.0135030	0.0177227	-----	0.0043945	0.0092697	0.0115657	-----	0.0032000	0.0065520	0.0078155
AAbbd-	-----	0.078125	0.0175781	0.0239258	-----	0.061728	0.0135030	0.0177227	-----	0.0043945	0.0092697	0.0115657	-----	0.0032000	0.0065520	0.0078155
AAbbd	-----	0.078125	0.0175781	0.0239258	-----	0.061728	0.0135030	0.0177227	-----	0.0043945	0.0092697	0.0115657	-----	0.0032000	0.0065520	0.0078155
AAbbd--	-----	0.078125	0.0175781	0.0239258	-----	0.061728	0.0135030	0.0177227	-----	0.0043945	0.0092697	0.0115657	-----	0.0032000	0.0065520	0.0078155
aABBD----	-----	0.078125	0.0175781	0.0239258	-----	0.061728	0.0135030	0.0177227	-----	0.0043945	0.0092697	0.0115657	-----	0.0032000	0.0065520	0.0078155
aABBD-	-----	0.078125	0.0175781	0.0239258	-----	0.061728	0.0135030	0.0177227	-----	0.0043945	0.0092697	0.0115657	-----	0.0032000	0.0065520	0.0078155
aABBD	-----	0.078125	0.0175781	0.0239258	-----	0.061728	0.0135030	0.0177227	-----	0.0043945	0.0092697	0.0115657	-----	0.0032000	0.0065520	0.0078155
aABBD--	-----	0.078125	0.0175781	0.0239258	-----	0.061728	0.0135030	0.0177227	-----	0.0043945	0.0092697	0.0115657	-----	0.0032000	0.0065520	0.0078155
aAabD----	-----	0.2187500	0.1484375	0.1308594	0.4444444	0.1851851	0.188252	0.0994327	0.3750000	0.1464844	0.0868835	0.0675024	0.3200000	0.1184000	0.0634073	0.0474615
Aabbd----	-----	0.039063	0.0087891	0.0119629	-----	0.030864	0.004521	0.0147490	-----	0.021973	0.0077248	0.0127222	-----	0.016000	0.0060840	0.0103022
Aabbd-	-----	0.039063	0.0087891	0.0119629	-----	0.030864	0.004521	0.0147490	-----	0.021973	0.0077248	0.0127222	-----	0.016000	0.0060840	0.0103022
Aabbd	-----	0.039063	0.0087891	0.0119629	-----	0.030864	0.004521	0.0147490	-----	0.021973	0.0077248	0.0127222	-----	0.016000	0.0060840	0.0103022
Aabbd--	-----	0.039063	0.0087891	0.0119629	-----	0.030864	0.004521	0.0147490	-----	0.021973	0.0077248	0.0127222	-----	0.016000	0.0060840	0.0103022
AaBbd----	-----	0.068750	0.0585938	0.0615234	-----	0.0617284	0.0748454	0.0806807	-----	0.0615234	0.0704498	0.0739600	-----	0.0576000	0.0627358	0.0636086
AaBbd-	-----	0.068750	0.0585938	0.0615234	-----	0.0617284	0.0748454	0.0806807	-----	0.0615234	0.0704498	0.0739600	-----	0.0576000	0.0627358	0.0636086
AaBbd	-----	0.068750	0.0585938	0.0615234	-----	0.0617284	0.0748454	0.0806807	-----	0.0615234	0.0704498	0.0739600	-----	0.0576000	0.0627358	0.0636086
AaBbd--	-----	0.068750	0.0585938	0.0615234	-----	0.0617284	0.0748454	0.0806807	-----	0.0615234	0.0704498	0.0739600	-----	0.0576000	0.0627358	0.0636086
AabbD----	-----	0.0390625	0.0410156	0.0375977	-----	0.0555555	0.0783178	0.0852383	-----	0.0571289	0.0916672	0.1067346	-----	0.0544000	0.0939119	0.1133754
AabbD-	-----	0.0390625	0.0410156	0.0375977	-----	0.0555555	0.0783178	0.0852383	-----	0.0571289	0.0916672	0.1067346	-----	0.0544000	0.0939119	0.1133754
AabbD	-----	0.0390625	0.0410156	0.0375977	-----	0.0555555	0.0783178	0.0852383	-----	0.0571289	0.0916672	0.1067346	-----	0.0544000	0.0939119	0.1133754
AabbD--	-----	0.0390625	0.0410156	0.0375977	-----	0.0555555	0.0783178	0.0852383	-----	0.0571289	0.0916672	0.1067346	-----	0.0544000	0.0939119	0.1133754
aabbD----	-----	0.0976563	0.0478516	0.0295410	0.4444444	0.2500000	0.1622298	0.1229873	0.5625000	0.3713379	0.2719460	0.2238656	0.6400000	0.4623994	0.3624041	0.3119229

Table 31.--Relative frequencies of genotypes when native population (AABBDd) is overflooded once in parental generation by $\bar{X}$ release insects (aabbdd) for every native insect--
Continued

Genotype	$\bar{X} = 5$				$\bar{X} = 10$				$\bar{X} = 50$				$\bar{X} = 100$			
	F ₁	F ₂	F ₃	F ₄	F ₁	F ₂	F ₃	F ₄	F ₁	F ₂	F ₃	F ₄	F ₁	F ₂	F ₃	F ₄
AABBDd ---	0.0280000	0.0039062	0.0007716	0.0002178	0.0082645	0.0008367	0.0001126	0.0000214	0.0003845	0.0000269	0.0000021	0.0000002	0.0000980	0.0000065	0.0000005	0.0000000
AABBDd ---	-----	.0043403	.0019290	.0008967	-----	.0011953	.0003887	.0001292	-----	.0000499	.0000108	.0000021	-----	.0000125	.0000025	.0000004
AaBBDd ---	-----	.0043403	.0019290	.0008967	-----	.0011953	.0003887	.0001292	-----	.0000499	.0000108	.0000021	-----	.0000125	.0000025	.0000004
AaBBDd ---	-----	.0043403	.0019290	.0008967	-----	.0011953	.0003887	.0001292	-----	.0000499	.0000108	.0000021	-----	.0000125	.0000025	.0000004
AABBDd ---	-----	.0012056	.0012056	.0009231	-----	.0004269	.0003354	.0001951	-----	.0000231	.0000140	.0000055	-----	.0000060	.0000035	.0000013
AABBDd ---	-----	.0012056	.0012056	.0009231	-----	.0004269	.0003354	.0001951	-----	.0000231	.0000140	.0000055	-----	.0000060	.0000035	.0000013
aaBBDd ---	-----	.0012056	.0012056	.0009131	-----	.0004269	.0003354	.0001951	-----	.0000231	.0000140	.0000055	-----	.0000060	.0000035	.0000013
AABBDd ---	-----	.0067515	.0062693	.0045361	-----	.0020490	.0015976	.0009300	-----	.0000961	.0000389	.0000237	-----	.0000245	.0000144	.0000054
AaBBDd ---	-----	.0067515	.0062693	.0045361	-----	.0020490	.0015976	.0009300	-----	.0000961	.0000389	.0000237	-----	.0000245	.0000144	.0000054
AaBBDd ---	-----	.0067515	.0062693	.0045361	-----	.0020490	.0015976	.0009300	-----	.0000961	.0000389	.0000237	-----	.0000245	.0000144	.0000054
AABBDd ---	-----	.0024113	.0048225	.0055383	-----	.0008538	.0015995	.0016301	-----	.0000462	.0000799	.0000680	-----	.0000120	.0000205	.0000169
AABBDd ---	-----	.0024113	.0048225	.0055383	-----	.0008538	.0015995	.0016301	-----	.0000462	.0000799	.0000680	-----	.0000120	.0000205	.0000169
AaBBDd ---	-----	.0024113	.0048225	.0055383	-----	.0008538	.0015995	.0016301	-----	.0000462	.0000799	.0000680	-----	.0000120	.0000205	.0000169
AaBBDd ---	-----	.0024113	.0048225	.0055383	-----	.0008538	.0015995	.0016301	-----	.0000462	.0000799	.0000680	-----	.0000120	.0000205	.0000169
aaBBDd ---	-----	.0024113	.0048225	.0055383	-----	.0008538	.0015995	.0016301	-----	.0000462	.0000799	.0000680	-----	.0000120	.0000205	.0000169
AABBDd ---	.2800000	.0983795	.0511181	.0349327	.1652289	.0515675	.0218510	.0120912	.0384468	.0101660	.0029998	.0010344	.0196059	.0050456	.0013796	.0004160
AABBDd ---	-----	.0012056	.0048225	.0083075	-----	.0004269	.0019071	.0034040	-----	.0000231	.0001139	.0002094	-----	.0000060	.0000300	.0000554
AaBBDd ---	-----	.0012056	.0048225	.0083075	-----	.0004269	.0019071	.0034040	-----	.0000231	.0001139	.0002094	-----	.0000060	.0000300	.0000554
aaBBDd ---	-----	.0012056	.0048225	.0083075	-----	.0004269	.0019071	.0034040	-----	.0000231	.0001139	.0002094	-----	.0000060	.0000300	.0000554
AaBBDd ---	-----	.0530478	.0554588	.0543285	-----	.0358582	.0332412	.0285570	-----	.0093308	.0073844	.0048794	-----	.0048289	.0037237	.0023237
AaBBDd ---	-----	.0530478	.0554588	.0543285	-----	.0358582	.0332412	.0285570	-----	.0093308	.0073844	.0048794	-----	.0048289	.0037237	.0023237
aaBBDd ---	-----	.0538478	.0554588	.0543285	-----	.0358582	.0332412	.0285570	-----	.0093308	.0073844	.0048794	-----	.0048289	.0037237	.0023237
AaBBDd ---	-----	.0506365	.0916278	.1131409	-----	.0350044	.0701723	.0908340	-----	.0092846	.0203895	.0274679	-----	.0048169	.0107065	.0144976
AaBBDd ---	-----	.0506365	.0916278	.1131409	-----	.0350044	.0701723	.0908340	-----	.0092846	.0203895	.0274679	-----	.0048169	.0107065	.0144976
aaBBDd ---	-----	.0506365	.0916278	.1131409	-----	.0350044	.0701723	.0908340	-----	.0092846	.0203895	.0274679	-----	.0048169	.0107065	.0144976
aaBBDd ---	.6944444	.5316837	.4352337	.3852191	.8264462	.7175908	.6455109	.6059582	.9611687	.9331066	.9126031	.9007925	.9802959	.9657912	.9550533	.9488312

Table 31.--Relative frequencies of genotypes when native population (AABBDD) is overflooded once in parental generation by $\bar{X}$ release insects (aabbdd) for every native insect--
Continued

Genotype	$\bar{X} = 200$				$\bar{X} = 1,000$			
	F ₁	F ₂	F ₃	F ₄	F ₁	F ₂	F ₃	F ₄
AAB3DD ---	0.0000248	0.0000016	0.0000001	0.0000001	0.0000010	0.0000001	0.0000000	0.0000000
AAB3Dd ---	-----	.0000031	.0000006	.0000010	-----	.0000001	.0000000	.0000000
AABbDD ---	-----	.0000031	.0000006	.0000010	-----	.0000001	.0000000	.0000000
AaB3DD ---	-----	.0000031	.0000006	.0000010	-----	.0000001	.0000000	.0000000
AAB3dd ---	-----	.0000015	.0000009	.0000003	-----	.0000001	.0000000	.0000000
AAbbDD ---	-----	.0000015	.0000009	.0000003	-----	.0000001	.0000000	.0000000
aaB3DD ---	-----	.0000015	.0000009	.0000003	-----	.0000001	.0000000	.0000000
AABbDd ---	-----	.0000062	.0000036	.0000013	-----	.0000002	.0000001	.0000000
AaB3Dd ---	-----	.0000062	.0000036	.0000013	-----	.0000002	.0000001	.0000000
AaBbDD ---	-----	.0000062	.0000036	.0000013	-----	.0000002	.0000001	.0000000
AABbdd ---	-----	.0000031	.0000052	.0000042	-----	.0000001	.0000002	.0000002
AAbbDd ---	-----	.0000031	.0000052	.0000042	-----	.0000001	.0000002	.0000002
AaB3dd ---	-----	.0000031	.0000052	.0000042	-----	.0000001	.0000002	.0000002
AabbDD ---	-----	.0000031	.0000052	.0000042	-----	.0000001	.0000002	.0000002
aaB3Dd ---	-----	.0000031	.0000052	.0000042	-----	.0000001	.0000002	.0000002
aaBbDD ---	-----	.0000031	.0000052	.0000042	-----	.0000001	.0000002	.0000002
AaBbDd ---	.0099007	.0025119	.0006580	.0001822	.0019960	.0005000	.0001263	.0000323
AAbbdd ---	-----	.0000015	.0000077	.0000142	-----	.0000001	.0000003	.0000006
aaB3dd ---	-----	.0000015	.0000077	.0000142	-----	.0000001	.0000003	.0000006
aabbDD ---	-----	.0000015	.0000077	.0000142	-----	.0000001	.0000003	.0000006
AaBbdd ---	-----	.0024567	.0018688	.0011291	-----	.0004983	.0003748	.0002202
AabbDd ---	-----	.0024567	.0018688	.0011291	-----	.0004983	.0003748	.0002202
aaBbDd ---	-----	.0024567	.0018688	.0011291	-----	.0004983	.0003748	.0002202
Aabbdd ---	-----	.0024537	.0058471	.0074492	-----	.0004981	.0011194	.0015229
aaBbdd ---	-----	.0024537	.0058471	.0074492	-----	.0004981	.0011194	.0015229
aabbDd ---	-----	.0024537	.0058471	.0074492	-----	.0004981	.0011194	.0015229
aabbdd ---	.9900745	.9826995	.9772047	.9740093	.9980030	.9965084	.9953883	.9947354

Table 32.--Relative frequencies of genotypes when native population (AABBDDEE) is overflooded once in parental generation by X release insects (aabbdd~~ee~~) for every native insect

Genotype	$\bar{X} = 1$				$\bar{X} = 2$				$\bar{X} = 3$			
	F ₁	F ₂	F ₃	F ₄	F ₁	F ₂	F ₃	F ₄	F ₁	F ₂	F ₃	F ₄
AABBDDeE_0.2500000	0.0791016	0.0275612	0.0125576	0.1111111	0.0192901	0.0040523	0.0011956	0.0625000	0.0073853	0.0011269	0.0002485	
AABBDDeE----	0.0175781	0.015095	0.0134057	----	0.0077160	0.0042733	0.0021711	----	0.0040283	0.0015490	0.0005960	
AABBDDeE----	0.0175781	0.015095	0.0134057	----	0.0077160	0.0042733	0.0021711	----	0.0040283	0.0015490	0.0005960	
AABBDDeE----	0.0175781	0.015095	0.0134057	----	0.0077160	0.0042733	0.0021711	----	0.0040283	0.0015490	0.0005960	
AaBBDDeE----	0.0175781	0.015095	0.0134057	----	0.0077160	0.0042733	0.0021711	----	0.0040283	0.0015490	0.0005960	
AABBDDee----	0.0009766	0.0027809	0.0035778	----	0.0007716	0.0011266	0.0009856	----	0.0005493	0.0005323	0.0003574	
AABBDdeE----	0.0009766	0.0027809	0.0035778	----	0.0007716	0.0011266	0.0009856	----	0.0005493	0.0005323	0.0003574	
AaBbDDeE----	0.0009766	0.0027809	0.0035778	----	0.0007716	0.0011266	0.0009856	----	0.0005493	0.0005323	0.0003574	
aaBBDDeE----	0.0009766	0.0027809	0.0035778	----	0.0007716	0.0011266	0.0009856	----	0.0005493	0.0005323	0.0003574	
AABRdDeE----	0.0195313	0.0191803	0.0182631	----	0.0092593	0.0068212	0.0048427	----	0.0051270	0.0030561	0.0017351	
AABRDDeE----	0.0195313	0.0191803	0.0182631	----	0.0092593	0.0068212	0.0048427	----	0.0051270	0.0030561	0.0017351	
AABbdDeE----	0.0195313	0.0191803	0.0182631	----	0.0092593	0.0068212	0.0048427	----	0.0051270	0.0030561	0.0017351	
AaBBDDeE----	0.0195313	0.0191803	0.0182631	----	0.0092593	0.0068212	0.0048427	----	0.0051270	0.0030561	0.0017351	
AaBbdDeE----	0.0195313	0.0191803	0.0182631	----	0.0092593	0.0068212	0.0048427	----	0.0051270	0.0030561	0.0017351	
AABBDDee----	0.0019531	0.0043259	0.0059289	----	0.0015432	0.0024086	0.0026071	----	0.0010986	0.0013687	0.0012237	
AABBDdeE----	0.0019531	0.0043259	0.0059289	----	0.0015432	0.0024086	0.0026071	----	0.0010986	0.0013687	0.0012237	
AABbdDeE----	0.0019531	0.0043259	0.0059289	----	0.0015432	0.0024086	0.0026071	----	0.0010986	0.0013687	0.0012237	
AaBbDDeE----	0.0019531	0.0043259	0.0059289	----	0.0015432	0.0024086	0.0026071	----	0.0010986	0.0013687	0.0012237	
AaBbdDeE----	0.0019531	0.0043259	0.0059289	----	0.0015432	0.0024086	0.0026071	----	0.0010986	0.0013687	0.0012237	
AaBBDDeE----	0.0019531	0.0043259	0.0059289	----	0.0015432	0.0024086	0.0026071	----	0.0010986	0.0013687	0.0012237	
AaBbdDeE----	0.0019531	0.0043259	0.0059289	----	0.0015432	0.0024086	0.0026071	----	0.0010986	0.0013687	0.0012237	
aaBBDDeE----	0.0019531	0.0043259	0.0059289	----	0.0015432	0.0024086	0.0026071	----	0.0010986	0.0013687	0.0012237	
aaBbdDeE----	0.0019531	0.0043259	0.0059289	----	0.0015432	0.0024086						

Table 32.--Relative frequencies of genotypes when native population (AABBDEEE) is overflooded once in parental generation by X release insects (aabbddde) for every native insect--Continued

[illegible]

Table 32.--Relative frequencies of genotypes when native population (AABBDDEE) is overflooded once in parental generation by X
release insects (aabbdd ee) for every native insect--Continued

Genotype	X = 20				X = 50				X = 100			
	F ₁	F ₂	F ₃	F ₄	F ₁	F ₂	F ₃	F ₄	F ₁	F ₂	F ₃	F ₄
AABBDDEE_0_0022676	0.0000630	0.0000024	0.0000001	0.0003845	0.0000078	0.0000002	0.0000000	0.0000980	0.0000018	0.0000000	0.0000000	0.0000000
AABBDDEE_0_0000900	0.0000900	0.0000085	0.0000009	0.0000134	0.0000009	0.0000001	0.0000000	0.0000032	0.0000002	0.0000000	0.0000000	0.0000000
AABBDDEE_0_0000900	0.0000900	0.0000085	0.0000009	0.0000134	0.0000009	0.0000001	0.0000000	0.0000032	0.0000002	0.0000000	0.0000000	0.0000000
AABbDDEE_0_0000900	0.0000900	0.0000085	0.0000009	0.0000134	0.0000009	0.0000001	0.0000000	0.0000032	0.0000002	0.0000000	0.0000000	0.0000000
AaBBDDEE_0_0000900	0.0000900	0.0000085	0.0000009	0.0000134	0.0000009	0.0000001	0.0000000	0.0000032	0.0000002	0.0000000	0.0000000	0.0000000
AABBDDee_0_0000321	0.0000321	0.0000075	0.0000014	0.0000558	0.0000010	0.0000001	0.0000000	0.0000015	0.0000002	0.0000000	0.0000000	0.0000000
AABbDDee_0_0000321	0.0000321	0.0000075	0.0000014	0.0000558	0.0000010	0.0000001	0.0000000	0.0000015	0.0000002	0.0000000	0.0000000	0.0000000
AAbbDDEE_0_0000321	0.0000321	0.0000075	0.0000014	0.0000558	0.0000010	0.0000001	0.0000000	0.0000015	0.0000002	0.0000000	0.0000000	0.0000000
aaBBDDEE_0_0000321	0.0000321	0.0000075	0.0000014	0.0000558	0.0000010	0.0000001	0.0000000	0.0000015	0.0000002	0.0000000	0.0000000	0.0000000
AABBDDee_0_0001543	0.0001543	0.0000354	0.0000066	0.000249	0.0000044	0.0000006	0.0000000	0.0000062	0.0000010	0.0000001	0.0000001	0.0000001
AABbDDee_0_0001543	0.0001543	0.0000354	0.0000066	0.000249	0.0000044	0.0000006	0.0000000	0.0000062	0.0000010	0.0000000	0.0000000	0.0000000
AABbDDee_0_0001543	0.0001543	0.0000354	0.0000066	0.000249	0.0000044	0.0000006	0.0000000	0.0000062	0.0000010	0.0000000	0.0000000	0.0000000
AaBBDDee_0_0001543	0.0001543	0.0000354	0.0000066	0.000249	0.0000044	0.0000006	0.0000000	0.0000062	0.0000010	0.0000000	0.0000001	0.0000001
AaBbDDee_0_0001543	0.0001543	0.0000354	0.0000066	0.000249	0.0000044	0.0000006	0.0000000	0.0000062	0.0000010	0.0000000	0.0000001	0.0000001
AABBDDee_0_0000643	0.0000643	0.0000360	0.0000124	0.000115	0.0000055	0.0000014	0.0000000	0.0000030	0.0000014	0.0000003	0.0000003	0.0000003
AABbDDee_0_0000643	0.0000643	0.0000360	0.0000124	0.000115	0.0000055	0.0000014	0.0000000	0.0000030	0.0000014	0.0000003	0.0000003	0.0000003
AABbDDee_0_0000643	0.0000643	0.0000360	0.0000124	0.000115	0.0000055	0.0000014	0.0000000	0.0000030	0.0000014	0.0000003	0.0000003	0.0000003
AaBBDDee_0_0000643	0.0000643	0.0000360	0.0000124	0.000115	0.0000055	0.0000014	0.0000000	0.0000030	0.0000014	0.0000003	0.0000003	0.0000003
AaBbDDee_0_0000643	0.0000643	0.0000360	0.0000124	0.000115	0.0000055	0.0000014	0.0000000	0.0000030	0.0000014	0.0000003	0.0000003	0.0000003
AaBBDDee_0_0000643	0.0000643	0.0000360	0.0000124	0.000115	0.0000055	0.0000014	0.0000000	0.0000030	0.0000014	0.0000003	0.0000003	0.0000003
AaBbDDee_0_0000643	0.0000643	0.0000360	0.0000124	0.000115	0.0000055	0.0000014	0.0000000	0.0000030	0.0000014	0.0000003	0.0000003	0.0000003
AABbDDee_0_0002828	0.0002828	0.0001643	0.0000577	0.000480	0.000235	0.0000063	0.0000000	0.000122	0.0000056	0.0000013	0.0000013	0.0000013
AaBBDDee_0_0002828	0.0002828	0.0001643	0.0000577	0.000480	0.000235	0.0000063	0.0000000	0.000122	0.0000056	0.0000013	0.0000013	0.0000013
AaBbDDee_0_0002828	0.0002828	0.0001643	0.0000577	0.000480	0.000235	0.0000063	0.0000000	0.000122	0.0000056	0.0000013	0.0000013	0.0000013
AaBBDDee_0_0002828	0.0002828	0.0001643	0.0000577	0.000480	0.000235	0.0000063	0.0000000	0.000122	0.0000056	0.0000013	0.0000013	0.0000013
AABBDDee_0_0000321	0.0000321	0.0000432	0.0000269	0.000058	0.0000075	0.0000040	0.0000000	0.000015	0.0000019	0.0000010	0.0000010	0.0000010
AABbDDee_0_0000321	0.0000321	0.0000432	0.0000269	0.000058	0.0000075	0.0000040	0.0000000	0.000015	0.0000019	0.0000010	0.0000010	0.0000010
AABbDDee_0_0000321	0.0000321	0.0000432	0.0000269	0.000058	0.0000075	0.0000040	0.0000000	0.000015	0.0000019	0.0000010	0.0000010	0.0000010
aaBBDDee_0_0000321	0.0000321	0.0000432	0.0000269	0.000058	0.0000075	0.0000040	0.0000000	0.000015	0.0000019	0.0000010	0.0000010	0.0000010
aaBBDDee_0_0000321	0.0000321	0.0000432	0.0000269	0.000058	0.0000075	0.0000040	0.0000000	0.000015	0.0000019	0.0000010	0.0000010	0.0000010
AABBDDee_0_0001285	0.0001285	0.0001858	0.0001209	0.000231	0.000310	0.000169	0.0000000	0.000060	0.0000078	0.0000040	0.0000040	0.0000040
AABbDDee_0_0001285	0.0001285	0.0001858	0.0001209	0.000231	0.000310	0.000169	0.0000000	0.000060	0.0000078	0.0000040	0.0000040	0.0000040
AABbDDee_0_0001285	0.0001285	0.0001858	0.0001209	0.000231	0.000310	0.000169	0.0000000	0.000060	0.0000078	0.0000040	0.0000040	0.0000040
AaBBDDee_0_0001285	0.0001285	0.0001858	0.0001209	0.000231	0.000310	0.000169	0.0000000	0.000060	0.0000078	0.0000040	0.0000040	0.0000040
AaBbDDee_0_0001285	0.0001285	0.0001858	0.0001209	0.000231	0.000310	0.000169	0.0000000	0.000060	0.0000078	0.0000040	0.0000040	0.0000040
AaBBDDee_0_0001285	0.0001285	0.0001858	0.0001209	0.000231	0.000310	0.000169	0.0000000	0.000060	0.0000078	0.0000040	0.0000040	0.0000040
AaBbDDee_0_0001285	0.0001285	0.0001858	0.0001209	0.000231	0.000310	0.000169	0.0000000	0.000060	0.0000078	0.0000040	0.0000040	0.0000040
AaBBDDee_0_0001285	0.0001285	0.0001858	0.0001209	0.000231	0.000310	0.000169	0.0000000	0.000060	0.0000078	0.0000040	0.0000040	0.0000040
AaBbDDee_0_0001285	0.0001285	0.0001858	0.0001209	0.000231	0.000310	0.000169	0.0000000	0.000060	0.0000078	0.0000040	0.0000040	0.0000040
AABBDDee_0_0000643	0.0000643	0.0002382	0.0002916	0.000115	0.000434	0.0000497	0.0000000	0.000030	0.0000114	0.0000126	0.0000126	0.0000126
AABbDDee_0_0000643	0.0000643	0.0002382	0.0002916	0.000115	0.000434	0.0000497	0.0000000	0.000030	0.0000114	0.0000126	0.0000126	0.0000126
AABbDDee_0_0000643	0.0000643	0.0002382	0.0002916	0.000115	0.000434	0.0000497	0.0000000	0.000030	0.0000114	0.0000126	0.0000126	0.0000126
AaBBDDee_0_0000643	0.0000643	0.0002382	0.0002916	0.000115	0.000434	0.0000497	0.0000000	0.000030	0.0000114	0.0000126	0.0000126	0.0000126
AaBbDDee_0_0000643	0.0000643	0.0002382	0.0002916	0.000115	0.000434	0.0000497	0.0000000	0.000030	0.0000114	0.0000126	0.0000126	0.0000126
AaBBDDee_0_0000643	0.0000643	0.0002382	0.0002916	0.000115	0.000434	0.0000497	0.0000000	0.000030	0.0000114	0.0000126	0.0000126	0.0000126
AaBbDDee_0_0000643	0.0000643	0.0002382	0.0002916	0.000115	0.000434	0.0000497	0.0000000	0.000030	0.0000114	0.0000126	0.0000126	0.0000126
AaBBDDee_0_0000643	0.0000643	0.0002382	0.0002916	0.000115	0.000434	0.0000497	0.0000000	0.000030	0.0000114	0.0000126	0.0000126	0.0000126
AaBbDDee_0_0000643	0.0000643	0.0002382	0.0002916	0.000115	0.000434	0.0000497	0.0000000	0.000030	0.0000114	0.0000126	0.0000126	0.0000126
AABbDDee_0_0907029	0.0149372	0.0033698	0.0010517	0.0384467	0.0054258	0.0009365	0.0002073	0.196059	0.0021689	0.0003923	0.0000704	0.0000704
AABbDDee_0_0000321	0.0000321	0.0002827	0.0007908	0.000058	0.0000629	0.0001557	0.0000000	0.000015	0.0000167	0.0000418	0.0000418	0.0000418
AaBBDDee_0_0000321	0.0000321	0.0002827	0.0007908	0.000058	0.0000629	0.0001557	0.0000000	0.000015	0.0000167	0.0000418	0.0000418	0.0000418
AaBbDDee_0_0000321	0.0000321	0.0002827	0.0007908	0.000058	0.0000629	0.0001557	0.0000000	0.000015	0.0000167	0.0000418	0.0000418	0.0000418
AaBBDDee_0_0105488	0.0105488	0.0055177	0.029070	0.0046654	0.020399	0.0008209	0.0000000	0.0024145	0.0009817	0.0003443	0.0003443	0.0003443
AaBbDDee_0_0105488	0.0105488	0.0055177	0.029070	0.0046654	0.020399	0.0008209	0.0000000	0.0024145	0.0009817	0.0003443	0.0003443	0.0003443
AaBBDDee_0_0105488	0.0105488	0.0055177	0.029070	0.0046654	0.020399	0.0008209	0.0000000	0.0024145	0.0009817	0.0003443	0.0003443	0.0003443
AaBbDDee_0_0105488	0.0105488	0.0055177	0.029070	0.0046654	0.020399	0.0008209	0.0000000	0.0024145	0.0009817	0.0003443	0.0003443	0.0003443
AABBDDee_0_0104123	0.0104123	0.0121626	0.0104074	0.0046423	0.0053136	0.0040417	0.0000000	0.0024085	0.0027341	0.0019754	0.0019754	0.0019754
AABbDDee_0_0104123	0.0104123	0.0121626	0.0104074	0.0046423	0.0053136	0.0040417	0.0000000	0.0024085	0.0027341	0.0019754	0.0019754	0.0019754
AABbDDee_0_0104123	0.0104123	0.0121626	0.0104074	0.0046423	0.0053136	0.0040417	0.0000000	0.0024085	0.0027341	0.0019754	0.0019754	0.0019754
AaBBDDee_0_0104123	0.0104123	0.0121626	0.0104074	0.0046423	0.0053136	0.0040417	0.0000000	0.0024085	0.0027341	0.0019754	0.0019754	0.0019754
AaBbDDee_0_0104123	0.0104123	0.0121626	0.0104074	0.0046423	0.0053136	0.0040417	0.0000000	0.0024085	0.0027341	0.0019754	0.0019754	0.0019754
AABBDDee_0_0103481	0.0103481	0.0131740	0.0478775	0.0046308	0.0150326	0.0233767	0.0000000	0.0024055	0.0079610	0.0125095	0.0125095	0.0125095
AABbDDee_0_0103481	0.0103481	0.0131740	0.0478775	0.0046308	0.0150326	0.0233767	0.0000000	0.0024055	0.0079610	0.0125095	0.0125095	0.0125095
AABbDDee_0_0103481	0.0103481	0.0131740	0.0478775	0.0046308	0.0150326	0.0233767	0.0000000	0.0024055	0.0079610	0.0125095	0.0125095	0.0125095
aaBBDDee_0_90												

[illegible]

Table 33.--Relative frequencies of male genotypes when native population (3 autosomal genes BBDDEE plus 1 sex-linked gene AA; female is heterozygous) is overflooded once in parental generation by $\bar{X}$ release insects (aabbddde, a-bbddde) for every native insect--Continued

Genotype	$\bar{X} = 4$				$\bar{X} = 5$				$\bar{X} = 10$			
	F ₁	F ₂	F ₃	F ₄	F ₁	F ₂	F ₃	F ₄	F ₁	F ₂	F ₃	F ₄
AABBDDEE	0.020000	0.001800	0.0002184	0.0000388	0.0139000	0.0010188	0.0001036	0.0000156	0.0041322	0.0001729	0.0000104	0.0000009
AABbDDEE	-----	.0012800	.0003574	.0001118	-----	.0007837	.0001926	.0000512	-----	.0001921	.0000276	.0000045
AABBDDEE	-----	.0012000	.0003574	.0001118	-----	.0007837	.0001926	.0000512	-----	.0001921	.0000276	.0000045
AABbDDEE	-----	.0012000	.0003574	.0001118	-----	.0007837	.0001926	.0000512	-----	.0001921	.0000276	.0000045
AaBBDDEE	-----	.0012000	.0003574	.0001118	-----	.0007837	.0001926	.0000512	-----	.0001921	.0000276	.0000045
AaBbDDEE	-----	.0002000	.0001462	.0000805	-----	.0001507	.0000895	.0000421	-----	.0000534	.0000183	.0000053
AABbDDEE	-----	.0002000	.0001462	.0000805	-----	.0001507	.0000895	.0000421	-----	.0000534	.0000183	.0000053
AaBBDDEE	-----	.0002000	.0001462	.0000805	-----	.0001507	.0000895	.0000421	-----	.0000534	.0000183	.0000053
AaBbDDEE	-----	.0002000	.0001462	.0000805	-----	.0001507	.0000895	.0000421	-----	.0000534	.0000183	.0000053
AABBDDEE	-----	.0016000	.0008128	.0003884	-----	.0010851	.0004863	.0002025	-----	.0002988	.0000925	.0000253
AABbDDEE	-----	.0016000	.0008128	.0003884	-----	.0010851	.0004863	.0002025	-----	.0002988	.0000925	.0000253
AaBBDDEE	-----	.0016000	.0008128	.0003884	-----	.0010851	.0004863	.0002025	-----	.0002988	.0000925	.0000253
AaBbDDEE	-----	.0016000	.0008128	.0003884	-----	.0010851	.0004863	.0002025	-----	.0002988	.0000925	.0000253
AABBDDEE	-----	.0004000	.0004258	.0003275	-----	.0003014	.0002856	.0001946	-----	.0001067	.0000742	.0000349
AABbDDEE	-----	.0004000	.0004258	.0003275	-----	.0003014	.0002856	.0001946	-----	.0001067	.0000742	.0000349
AaBBDDEE	-----	.0004000	.0004258	.0003275	-----	.0003014	.0002856	.0001946	-----	.0001067	.0000742	.0000349
AaBbDDEE	-----	.0004000	.0004258	.0003275	-----	.0003014	.0002856	.0001946	-----	.0001067	.0000742	.0000349
AABBDDEE	-----	.0004000	.0004258	.0003275	-----	.0003014	.0002856	.0001946	-----	.0001067	.0000742	.0000349
AABbDDEE	-----	.0004000	.0004258	.0003275	-----	.0003014	.0002856	.0001946	-----	.0001067	.0000742	.0000349
AaBBDDEE	-----	.0004000	.0004258	.0003275	-----	.0003014	.0002856	.0001946	-----	.0001067	.0000742	.0000349
AaBbDDEE	-----	.0004000	.0004258	.0003275	-----	.0003014	.0002856	.0001946	-----	.0001067	.0000742	.0000349
AABBDDEE	-----	.0004000	.0004258	.0003275	-----	.0003014	.0002856	.0001946	-----	.0001067	.0000742	.0000349
AABbDDEE	-----	.0004000	.0004258	.0003275	-----	.0003014	.0002856	.0001946	-----	.0001067	.0000742	.0000349
AaBBDDEE	-----	.0004000	.0004258	.0003275	-----	.0003014	.0002856	.0001946	-----	.0001067	.0000742	.0000349
AaBbDDEE	-----	.0004000	.0004258	.0003275	-----	.0003014	.0002856	.0001946	-----	.0001067	.0000742	.0000349
AABBDDEE	-----	.0024000	.0023971	.0016493	-----	.0016879	.0015492	.0009740	-----	.0005123	.0003658	.0001698
AABbDDEE	-----	.0024000	.0023971	.0016493	-----	.0016879	.0015492	.0009740	-----	.0005123	.0003658	.0001698
AaBBDDEE	-----	.0024000	.0023971	.0016493	-----	.0016879	.0015492	.0009740	-----	.0005123	.0003658	.0001698
AaBbDDEE	-----	.0024000	.0023971	.0016493	-----	.0016879	.0015492	.0009740	-----	.0005123	.0003658	.0001698
AABBDDEE	-----	.0002000	.0003100	.0003331	-----	.0001507	.0002280	.0002248	-----	.0000534	.0000752	.0000574
AABbDDEE	-----	.0002000	.0003100	.0003331	-----	.0001507	.0002280	.0002248	-----	.0000534	.0000752	.0000574
AaBBDDEE	-----	.0002000	.0003100	.0003331	-----	.0001507	.0002280	.0002248	-----	.0000534	.0000752	.0000574
AaBbDDEE	-----	.0002000	.0003100	.0003331	-----	.0001507	.0002280	.0002248	-----	.0000534	.0000752	.0000574
AABBDDEE	-----	.0008000	.0015280	.0016265	-----	.0006028	.0010991	.0010915	-----	.0002134	.0003404	.0002699
AABbDDEE	-----	.0008000	.0015280	.0016265	-----	.0006028	.0010991	.0010915	-----	.0002134	.0003404	.0002699
AaBBDDEE	-----	.0008000	.0015280	.0016265	-----	.0006028	.0010991	.0010915	-----	.0002134	.0003404	.0002699
AaBbDDEE	-----	.0008000	.0015280	.0016265	-----	.0006028	.0010991	.0010915	-----	.0002134	.0003404	.0002699
AABBDDEE	-----	.0008000	.0015280	.0016265	-----	.0006028	.0010991	.0010915	-----	.0002134	.0003404	.0002699
AABbDDEE	-----	.0008000	.0015280	.0016265	-----	.0006028	.0010991	.0010915	-----	.0002134	.0003404	.0002699
AaBBDDEE	-----	.0008000	.0015280	.0016265	-----	.0006028	.0010991	.0010915	-----	.0002134	.0003404	.0002699
AaBbDDEE	-----	.0008000	.0015280	.0016265	-----	.0006028	.0010991	.0010915	-----	.0002134	.0003404	.0002699
AABBDDEE	-----	.0004000	.0013222	.0019536	-----	.0003014	.0010265	.0014830	-----	.0001067	.0003851	.0005102
AABbDDEE	-----	.0004000	.0013222	.0019536	-----	.0003014	.0010265	.0014830	-----	.0001067	.0003851	.0005102
AaBBDDEE	-----	.0004000	.0013222	.0019536	-----	.0003014	.0010265	.0014830	-----	.0001067	.0003851	.0005102
AaBbDDEE	-----	.0004000	.0013222	.0019536	-----	.0003014	.0010265	.0014830	-----	.0001067	.0003851	.0005102
AABBDDEE	-----	.0004000	.0013222	.0019536	-----	.0003014	.0010265	.0014830	-----	.0001067	.0003851	.0005102
AABbDDEE	-----	.0004000	.0013222	.0019536	-----	.0003014	.0010265	.0014830	-----	.0001067	.0003851	.0005102
AaBBDDEE	-----	.0004000	.0013222	.0019536	-----	.0003014	.0010265	.0014830	-----	.0001067	.0003851	.0005102
AaBbDDEE	-----	.0004000	.0013222	.0019536	-----	.0003014	.0010265	.0014830	-----	.0001067	.0003851	.0005102
AABBDDEE	-----	.0002000	.0014098	.0028643	-----	.0001507	.0011570	.0024459	-----	.0000534	.0004932	.0011345
AABbDDEE	-----	.0002000	.0014098	.0028643	-----	.0001507	.0011570	.0024459	-----	.0000534	.0004932	.0011345
AaBBDDEE	-----	.0002000	.0014098	.0028643	-----	.0001507	.0011570	.0024459	-----	.0000534	.0004932	.0011345
AaBbDDEE	-----	.0002000	.0014098	.0028643	-----	.0001507	.0011570	.0024459	-----	.0000534	.0004932	.0011345
AABBDDEE	-----	.0144000	.0133520	.0119863	-----	.0132620	.0112640	.0095031	-----	.0089645	.0058268	.0039119
AABbDDEE	-----	.0144000	.0133520	.0119863	-----	.0132620	.0112640	.0095031	-----	.0089645	.0058268	.0039119
AaBBDDEE	-----	.0144000	.0133520	.0119863	-----	.0132620	.0112640	.0095031	-----	.0089645	.0058268	.0039119
AaBbDDEE	-----	.0144000	.0133520	.0119863	-----	.0132620	.0112640	.0095031	-----	.0089645	.0058268	.0039119
AABBDDEE	-----	.0136000	.0164867	.0181903	-----	.0126591	.0153655	.0165684	-----	.0087511	.0104532	.0100960
AABbDDEE	-----	.0136000	.0164867	.0181903	-----	.0126591	.0153655	.0165684	-----	.0087511	.0104532	.0100960
AaBBDDEE	-----	.0136000	.0164867	.0181903	-----	.0126591	.0153655	.0165684	-----	.0087511	.0104532	.0100960
AaBbDDEE	-----	.0136000	.0164867	.0181903	-----	.0126591	.0153655	.0165684	-----	.0087511	.0104532	.0100960
AABBDDEE	-----	.0132000	.0291464	.0365424	-----	.0123577	.0294216	.0385180	-----	.0086444	.0242473	.0348103
AABbDDEE	-----	.0132000	.0291464	.0365424	-----	.0123577	.0294216	.0385180	-----	.0086444	.0242473	.0348103
AaBBDDEE	-----	.0132000	.0291464	.0365424	-----	.0123577	.0294216	.0385180	-----	.0086444	.0242473	.0348103
AaBbDDEE	-----	.0132000	.0291464	.0365424	-----	.0123577	.0294216	.0385180	-----	.0086444	.0242473	.0348103
aabbddde	-.3200000	.2178000	.1506456	.1165559	.3472222	.2533332	.1870379	.1516475	.4132231	.3500978	.2980147	.2670351

[illegible]

Table 33.--Relative frequencies of male genotypes when native population (3 autosomal genes BBDDEE plus 1 sex-linked gene AA; female is heterozygotic) is overflooded once in parental generation by $\bar{X}$ release insects (aabbdee, a-bbdee) for every native insect.--Continued

[illegible]

Table 34.--Relative frequencies of female genotypes when native population (3 autosomal genes BBdDEE plus 1 sex-linked gene AA; female is heterogametic) is overflooded once in parental generation by $\bar{X}$ release insects (aabbdd $\bar{e}$ e, a-bb $\bar{d}$ de $\bar{e}$) for every native insect

Genotype	$\bar{X} = 1$				$\bar{X} = 2$				$\bar{X} = 3$			
	F ₁	F ₂	F ₃	F ₄	F ₁	F ₂	F ₃	F ₄	F ₁	F ₂	F ₃	F ₄
A BBdDEE_0.1250000	0.0439453	0.0181580	0.0096298		0.0555555	0.0115741	0.0030944	0.0011406	0.0312500	0.0046997	0.0009507	0.0002732
A BBdDEe_-----	.0136720	.0135498	.0112679		-----	.0061728	.0038419	.0022981	-----	.0032959	.0015385	.0007318
A BBdDEE_-----	.0136720	.0135498	.0112679		-----	.0061728	.0038419	.0022981	-----	.0032959	.0015384	.0007318
A BBdDEE_-----	.0136720	.0135498	.0112679		-----	.0061728	.0038419	.0022961	-----	.0032959	.0015385	.0007318
A BBdDe_-----	.0009766	.0024719	.0032711		-----	.0007716	.0011654	.0011446	-----	.0005493	.0006083	.0004846
A BBdDE_-----	.0009766	.0024719	.0032711		-----	.0007716	.0011654	.0011446	-----	.0005493	.0006083	.0004846
A bbDDEE_-----	.0009766	.0024719	.0032711		-----	.0007716	.0011654	.0011446	-----	.0005493	.0006083	.0004846
A BBdDe_-----	.0156250	.0172119	.0169284		-----	.0077160	.0071693	.0057595	-----	.0043945	.0035319	.0024191
A BBdDE_-----	.0156250	.0172119	.0169284		-----	.0077160	.0071693	.0057595	-----	.0043945	.0035319	.0024191
A BBdDE_-----	.0156250	.0172119	.0169284		-----	.0077160	.0071693	.0057595	-----	.0043945	.0035319	.0024191
A BBdDe_-----	.0019531	.0043945	.0059812		-----	.0015432	.0028774	.0034213	-----	.0010986	.0017960	.0018958
A BBdDE_-----	.0019531	.0043945	.0059812		-----	.0015432	.0028774	.0034213	-----	.0010986	.0017960	.0018958
A BBdDE_-----	.0019531	.0043945	.0059812		-----	.0015432	.0028774	.0034213	-----	.0010986	.0017960	.0018958
A BBdDE_-----	.0019531	.0043945	.0059812		-----	.0015432	.0028774	.0034213	-----	.0010986	.0017960	.0018958
A BBdDE_-----	.0019531	.0043945	.0059812		-----	.0015432	.0028774	.0034213	-----	.0010986	.0017960	.0018958
A BBdDE_-----	.0019531	.0043945	.0059812		-----	.0015432	.0028774	.0034213	-----	.0010986	.0017960	.0018958
a BBdDEE_-----	.0048828	.0057678	.0051401		-----	.0023148	.0016316	.0010356	-----	.0012817	.0006534	.0003277
A BBdDEE_-.1250000	.0546875	.0371094	.0327126		.1111111	.0416666	.0244316	.0189655	.0937500	.0307617	.0157900	.0108102
a BBdDEe_-----	.0058594	.0069580	.0075297		-----	.0030864	.0029095	.0025141	-----	.0018311	.0014484	.0010456
a BBdDEE_-----	.0058594	.0069580	.0075297		-----	.0030864	.0029095	.0025141	-----	.0018311	.0014484	.0010456
a BBdDEE_-----	.0058594	.0069580	.0075297		-----	.0030864	.0029095	.0025141	-----	.0018311	.0014484	.0010456
A BBdDe_-----	.0009766	.0019226	.0027103		-----	.0007716	.0017441	.0025230	-----	.0005493	.0013036	.0018252
A bbDDEe_-----	.0009766	.0019226	.0027103		-----	.0007716	.0017441	.0025230	-----	.0005493	.0013036	.0018252
A BBdDEE_-----	.0009766	.0019226	.0027103		-----	.0007716	.0017441	.0025230	-----	.0005493	.0013036	.0018252
A BBdDe_-----	.0078125	.0120850	.0138311		-----	.0092593	.0123775	.0134673	-----	.0087891	.0101581	.0101845
A BBdDE_-----	.0078125	.0120850	.0138311		-----	.0092593	.0123775	.0134673	-----	.0087891	.0101581	.0101845
A BBdDE_-----	.0078125	.0120850	.0138311		-----	.0092593	.0123775	.0134673	-----	.0087891	.0101581	.0101845
a BBdDe_-----	.0009766	.0019226	.0027103		-----	.0007716	.0012458	.0015138	-----	.0005493	.0007821	.0008296
a BBdDE_-----	.0009766	.0019226	.0027103		-----	.0007716	.0012458	.0015138	-----	.0005493	.0007821	.0008296
a BBdDEE_-----	.0009766	.0019226	.0027103		-----	.0007716	.0012458	.0015138	-----	.0005493	.0007821	.0008296
a BBdDe_-----	.0078125	.0120850	.0138309		-----	.0046296	.0071050	.0075737	-----	.0029297	.0042272	.0041194
a BBdDE_-----	.0078125	.0120850	.0138309		-----	.0046296	.0071050	.0075737	-----	.0029297	.0042272	.0041194
a BBdDE_-----	.0078125	.0120850	.0138309		-----	.0046296	.0071050	.0075737	-----	.0029297	.0042272	.0041194
A BBdDe_-----	.0058594	.0069580	.0075299		-----	.0077160	.0102076	.0121419	-----	.0076904	.0102932	.0121922
A BBdDE_-----	.0058594	.0069580	.0075299		-----	.0077160	.0102076	.0121419	-----	.0076904	.0102932	.0121922
A BBdDE_-----	.0058594	.0069580	.0075299		-----	.0077160	.0102076	.0121419	-----	.0076904	.0102932	.0121922
a BBdDe_-----	.0019531	.0043945	.0059811		-----	.0015432	.0038740	.0054396	-----	.0010986	.0028389	.0038869
a BBdDE_-----	.0019531	.0043945	.0059811		-----	.0015432	.0038740	.0054396	-----	.0010986	.0028389	.0038869
a BBdDE_-----	.0019531	.0043945	.0059811		-----	.0015432	.0038740	.0054396	-----	.0010986	.0028389	.0038869
a BBdDE_-----	.0019531	.0043945	.0059811		-----	.0015432	.0038740	.0054396	-----	.0010986	.0028389	.0038869
a BBdDE_-----	.0019531	.0043945	.0059811		-----	.0015432	.0038740	.0054396	-----	.0010986	.0028389	.0038869
a BBdDE_-----	.0019531	.0043945	.0059811		-----	.0015432	.0038740	.0054396	-----	.0010986	.0028389	.0038869
a BBdDE_-----	.0019531	.0043945	.0059811		-----	.0015432	.0038740	.0054396	-----	.0010986	.0028389	.0038869
a BBdDE_-.1250000	.0546875	.0371094	.0327125		.1111111	.0509258	.0349742	.0307520	.0937500	.0424805	.0276518	.0229389
a BBdDe_-----	.0009766	.0024719	.0032711		-----	.0007716	.0029819	.0048613	-----	.0005493	.0025588	.0045359
a BBdDE_-----	.0009766	.0024719	.0032711		-----	.0007716	.0029819	.0048613	-----	.0005493	.0025588	.0045359
a BBdDE_-----	.0009766	.0024719	.0032711		-----	.0007716	.0029819	.0048613	-----	.0005493	.0025588	.0045359
A BBdDe_-----	.0048828	.0057678	.0051403		-----	.0069444	.0123537	.0140288	-----	.0071411	.0015182	.0190272
a BBdDe_-----	.0156250	.0172119	.0169285		-----	.0216050	.0250430	.0268719	-----	.0219727	.0250669	.0267941
a BBdDE_-----	.0156250	.0172119	.0169285		-----	.0216050	.0250430	.0268719	-----	.0219727	.0250669	.0267941
a BBdDE_-----	.0156250	.0172119	.0169285		-----	.0216050	.0250430	.0268719	-----	.0219727	.0250669	.0267941
a BBdDe_-----	.0136719	.0135498	.0112681		-----	.0200617	.0289505	.0304769	-----	.0208740	.0355403	.0411741
a BBdDE_-----	.0136719	.0135498	.0112681		-----	.0200617	.0289505	.0304769	-----	.0208740	.0355403	.0411741
a BBdDE_-----	.0136719	.0135498	.0112681		-----	.0200617	.0289505	.0304769	-----	.0208740	.0355403	.0411741
a BBdDe_-.1250000	.0439453	.0181580	.0096300		.2222222	.1180555	.0687608	.0474657	.2812500	.1785278	.1207906	.0929048

Table 34.--Relative frequencies of female genotypes when native population (3 autosomal genes BBdDEE plus 1 sex-linked gene AA; female is heterogametic) is overflooded once in parental generation by $\bar{X}$ release insects (aabbdde, a-bbddee) for every native insect--Continued

Genotype	$\bar{X} = 4$				$\bar{X} = 5$				$\bar{X} = 10$			
	F ₁	F ₂	F ₃	F ₄	F ₁	F ₂	F ₃	F ₄	F ₁	F ₂	F ₃	F ₄
A BBdDEE	0.0200000	0.0024000	0.0003971	0.0000947	0.0138889	0.0014106	0.0001999	0.0000412	0.0041322	0.0002689	0.0000242	0.0000032
A BBdDEe	-----	.002000	.0007638	.0003060	-----	.0013262	.0004358	.0001525	-----	.0003415	.0000739	.0000171
A BBdDEE	-----	.002000	.0007638	.0003060	-----	.0013262	.0004358	.0001525	-----	.0003415	.0000739	.0000171
A BbDDEE	-----	.002000	.0007638	.0003060	-----	.0013262	.0004358	.0001525	-----	.0003415	.0000739	.0000171
A BBdDee	-----	.0004000	.0003591	.0002442	-----	.0003014	.0002323	.0001394	-----	.0001067	.0000554	.0000228
A BBdDEe	-----	.0004000	.0003591	.0002442	-----	.0003014	.0002323	.0001394	-----	.0001067	.0000554	.0000228
A bbdDEE	-----	.0004000	.0003591	.0002442	-----	.0003014	.0002323	.0001394	-----	.0001067	.0000554	.0000228
A BBdDee	-----	.0028000	.0020064	.0012131	-----	.0019290	.0012609	.0006895	-----	.0005549	.0002755	.0001101
A BbDDEe	-----	.0028000	.0020064	.0012131	-----	.0019290	.0012609	.0006895	-----	.0005549	.0002755	.0001101
A BbDDEE	-----	.0028000	.0020064	.0012131	-----	.0019290	.0012609	.0006895	-----	.0005549	.0002755	.0001101
A BBdDee	-----	.0003000	.0011898	.0011407	-----	.0006028	.0008351	.0007403	-----	.0002134	.0002444	.0001699
A BbDDee	-----	.0003000	.0011898	.0011407	-----	.0006028	.0008351	.0007403	-----	.0002134	.0002444	.0001699
A BbDDEe	-----	.0003000	.0011898	.0011407	-----	.0006028	.0008351	.0007403	-----	.0002134	.0002444	.0001699
A BBdDEE	-----	.0003000	.0011898	.0011407	-----	.0006028	.0008351	.0007403	-----	.0002134	.0002444	.0001699
A BBdDEe	-----	.0003000	.0011898	.0011407	-----	.0006028	.0008351	.0007403	-----	.0002134	.0002444	.0001699
A bbdDEE	-----	.0003000	.0011898	.0011407	-----	.0006028	.0008351	.0007403	-----	.0002134	.0002444	.0001699
a BBdDEE	-----	.0008000	.0003249	.0001364	-----	.0005425	.0001859	.0000677	-----	.0001494	.0000321	.0000075
A BbDDEe	0.0800000	.0236000	.0108687	.0066964	.0694444	.0188078	.0079216	.0044681	.0413223	.0086657	.0027321	.0011515
a BBdDEe	-----	.0012000	.0008322	.0005217	-----	.0008439	.0005287	.0002959	-----	.0002561	.0001025	.0000475
a BBdDEE	-----	.0012000	.0008322	.0005217	-----	.0008439	.0005287	.0002959	-----	.0002561	.0001025	.0000475
a BbDDEE	-----	.0012000	.0008322	.0005217	-----	.0008439	.0005287	.0002959	-----	.0002561	.0001025	.0000475
A BbDdee	-----	.0004000	.0009711	.0013099	-----	.0003014	.0007410	.0009663	-----	.0001067	.0002677	.0003124
A bbdDee	-----	.0004000	.0009711	.0013099	-----	.0003014	.0007410	.0009663	-----	.0001067	.0002677	.0003124
A bbdDEE	-----	.0004000	.0009711	.0013099	-----	.0003014	.0007410	.0009663	-----	.0001067	.0002677	.0003124
A BbDdee	-----	.0080000	.0082042	.0076196	-----	.0072338	.0067313	.0058431	-----	.0046957	.0032539	.0022260
A BbDDEe	-----	.0080000	.0082042	.0076196	-----	.0072338	.0067313	.0058431	-----	.0046957	.0032539	.0022260
A bbdDEe	-----	.0080000	.0082042	.0076196	-----	.0072338	.0067313	.0058431	-----	.0046957	.0032539	.0022260
a BBdDee	-----	.0004000	.0005229	.0004969	-----	.0003014	.0003705	.0003221	-----	.0001067	.0001123	.0000748
a BBdDEE	-----	.0004000	.0005229	.0004969	-----	.0003014	.0003705	.0003221	-----	.0001067	.0001123	.0000748
a bbdDEE	-----	.0004000	.0005229	.0004969	-----	.0003014	.0003705	.0003221	-----	.0001067	.0001123	.0000748
a BBdDEe	-----	.0020000	.0027215	.0024511	-----	.0014468	.0018737	.0015784	-----	.0004696	.0005233	.0003548
a BBdDEE	-----	.0020000	.0027215	.0024511	-----	.0014468	.0018737	.0015784	-----	.0004696	.0005233	.0003548
a BbDDEE	-----	.0020000	.0027215	.0024511	-----	.0014468	.0018737	.0015784	-----	.0004696	.0005233	.0003548
A BbDdee	-----	.0072000	.0095657	.0110491	-----	.0066310	.0087093	.0097675	-----	.0044823	.0056117	.0055583
A bbdDee	-----	.0072000	.0095657	.0110491	-----	.0066310	.0087093	.0097675	-----	.0044823	.0056117	.0055583
A bbdDEe	-----	.0072000	.0095657	.0110491	-----	.0066310	.0087093	.0097675	-----	.0044823	.0056117	.0055583
a BBddee	-----	.0008000	.0020862	.0027668	-----	.0006028	.0015761	.0020287	-----	.0002134	.0005553	.0006451
a BBdDEe	-----	.0008000	.0020862	.0027668	-----	.0006028	.0015761	.0020287	-----	.0002134	.0005553	.0006451
a BbDDEe	-----	.0008000	.0020862	.0027668	-----	.0006028	.0015761	.0020287	-----	.0002134	.0005553	.0006451
a BbDDEE	-----	.0008000	.0020862	.0027668	-----	.0006028	.0015761	.0020287	-----	.0002134	.0005553	.0006451
a bbdDEe	-----	.0008000	.0020862	.0027668	-----	.0006028	.0015761	.0020287	-----	.0002134	.0005553	.0006451
a BbDDEe	-----	.0008000	.0020862	.0027668	-----	.0006028	.0015761	.0020287	-----	.0002134	.0005553	.0006451
a BBdDEe	0.0800000	.0356000	.0218332	.0170321	.0694444	.0303819	.0176361	.0129964	.0413223	.0171180	.0081931	.0048935
a BBddee	-----	.0004000	.0020709	.0038411	-----	.0003014	.0016703	.0031874	-----	.0001067	.0006858	.0013895
a bbdDee	-----	.0004000	.0020709	.0038411	-----	.0003014	.0016703	.0031874	-----	.0001067	.0006858	.0013895
a bbdDEE	-----	.0004000	.0020709	.0038411	-----	.0003014	.0016703	.0031874	-----	.0001067	.0006858	.0013895
A bbddee	-----	.0068000	.0159830	.0211357	-----	.0063296	.0158678	.0217050	-----	.0043756	.0126171	.0185395
a BbDDee	-----	.0208000	.0231628	.0241830	-----	.0192901	.0209976	.0213200	-----	.0132334	.0133664	.0120520
a BbDDEe	-----	.0208000	.0231628	.0241830	-----	.0192901	.0209976	.0213200	-----	.0132334	.0133664	.0120520
a bbdDEe	-----	.0208000	.0231628	.0241830	-----	.0192901	.0209976	.0213200	-----	.0132334	.0133664	.0120520
a BbDdee	-----	.0200000	.0373897	.0456376	-----	.0186873	.0371042	.0468022	-----	.0130199	.0294741	.0398582
a bbdDee	-----	.0200000	.0373897	.0456376	-----	.0186873	.0371042	.0468022	-----	.0130199	.0294741	.0398582
a bbdDEe	-----	.0200000	.0373897	.0456376	-----	.0186873	.0371042	.0468022	-----	.0130199	.0294741	.0398582
a bbddee	0.3200000	.2243999	.1652187	.1348273	.3472222	.2595120	.2017483	.1709067	.4132231	.3544198	.3101384	.2844399

Table 34.--Relative frequencies of female genotypes when native population (3 autosomal genes BBDDEE plus 1 sex-linked gene AA; female is heterogametic) is overflooded once in parental generation by $\bar{X}$ release insects (aabbdd $\bar{e}e$, a-bb $\bar{d}d\bar{e}e$) for every native insect--Continued

Genotype	$\bar{X} = 20$				$\bar{X} = 50$				$\bar{X} = 100$			
	F ₁	F ₂	F ₃	F ₄	F ₁	F ₂	F ₃	F ₄	F ₁	F ₂	F ₃	F ₄
A BBDDEE	0.0011338	0.0000540	0.0000033	0.0000003	0.0001922	0.0000072	0.0000003	0.0000000	0.0000490	0.0000017	0.0000003	0.0000000
A BBDDEe	-----	.0000836	.0000131	.0000021	-----	.0000129	.0000015	.0000002	-----	.0000032	.0000003	.0000000
A BbDDEE	-----	.0000836	.0000131	.0000021	-----	.0000129	.0000015	.0000002	-----	.0000032	.0000003	.0000000
A BbDDEe	-----	.0000836	.0000131	.0000021	-----	.0000129	.0000015	.0000002	-----	.0000032	.0000003	.0000000
A BBDDee	-----	.0000321	.0000013	.0000038	-----	.0000058	.0000019	.0000004	-----	.0000015	.0000005	.0000001
A BbDdEE	-----	.0000321	.0000013	.0000038	-----	.0000058	.0000019	.0000004	-----	.0000015	.0000005	.0000001
A BbDDEe	-----	.0000321	.0000013	.0000038	-----	.0000058	.0000019	.0000004	-----	.0000015	.0000005	.0000001
A BBDDee	-----	.0001478	.0000588	.0000177	-----	.0000245	.0000081	.0000018	-----	.0000062	.0000019	.0000004
A BbDDEe	-----	.0001478	.0000588	.0000177	-----	.0000245	.0000081	.0000018	-----	.0000062	.0000019	.0000004
A BbDDEe	-----	.0001478	.0000588	.0000177	-----	.0000245	.0000081	.0000018	-----	.0000062	.0000019	.0000004
A BBDdEE	-----	.0000643	.0000645	.0000364	-----	.0000115	.0000105	.0000049	-----	.0000030	.0000026	.0000011
A BbdEe	-----	.0000643	.0000645	.0000364	-----	.0000115	.0000105	.0000049	-----	.0000030	.0000026	.0000011
A BbDDee	-----	.0000643	.0000645	.0000364	-----	.0000115	.0000105	.0000049	-----	.0000030	.0000026	.0000011
A BbDdEE	-----	.0000643	.0000645	.0000364	-----	.0000115	.0000105	.0000049	-----	.0000030	.0000026	.0000011
A BbDDEe	-----	.0000643	.0000645	.0000364	-----	.0000115	.0000105	.0000049	-----	.0000030	.0000026	.0000011
A BbDDEe	-----	.0000643	.0000645	.0000364	-----	.0000115	.0000105	.0000049	-----	.0000030	.0000026	.0000011
a BBDDEE	---	-----	.0000386	.0000059	-----	.0000062	.0000007	.0000001	-----	.0000016	.0000002	.0000000
A BbDDEe	---	.0226757	.0038757	.0009246	.0096117	.0013872	.0002459	.0000550	.0049015	.0006609	.0001009	.0000183
a BBDDEe	---	-----	.0000707	.0000269	-----	.0000120	.0000039	.0000009	-----	.0000031	.0000009	.0000002
a BBDDEE	---	-----	.0000707	.0000269	-----	.0000120	.0000039	.0000009	-----	.0000031	.0000009	.0000002
a BbDDEE	---	-----	.0000707	.0000269	-----	.0000120	.0000039	.0000009	-----	.0000031	.0000009	.0000002
A BbdEe	---	-----	.0000321	.0000811	-----	.0000058	.0000146	.0000144	-----	.0000015	.0000038	.0000036
A BBDDee	---	-----	.0000321	.0000811	-----	.0000058	.0000146	.0000144	-----	.0000015	.0000038	.0000036
A bbdEE	---	-----	.0000321	.0000811	-----	.0000058	.0000146	.0000144	-----	.0000015	.0000038	.0000036
A BbdEe	---	-----	.0026995	.0014723	-----	.0011779	.0005254	.0002136	-----	.0006066	.0002494	.0000880
A BbddEe	---	-----	.0026995	.0014723	-----	.0011779	.0005254	.0002136	-----	.0006066	.0002494	.0000880
A BbDdEe	---	-----	.0026995	.0014723	-----	.0011779	.0005254	.0002136	-----	.0006066	.0002494	.0000880
a BBDDee	---	-----	.0000321	.0000306	-----	.0000058	.0000051	.0000023	-----	.0000015	.0000013	.0000006
a BBDdEE	---	-----	.0000321	.0000306	-----	.0000058	.0000051	.0000023	-----	.0000015	.0000013	.0000006
a bbdEE	---	-----	.0000321	.0000306	-----	.0000058	.0000051	.0000023	-----	.0000015	.0000013	.0000006
a BBDdEe	---	-----	.0001350	.0001340	-----	.0000236	.0000214	.0000100	-----	.0000061	.0000053	.0000023
a BbDDEe	---	-----	.0001350	.0001340	-----	.0000236	.0000214	.0000100	-----	.0000061	.0000053	.0000023
a BbDDEE	---	-----	.0001350	.0001340	-----	.0000236	.0000214	.0000100	-----	.0000061	.0000053	.0000023
A Bbddee	---	-----	.0026352	.0031598	-----	.0011664	.0013501	.0010352	-----	.0006036	.0006892	.0005002
A bbDdee	---	-----	.0026352	.0031598	-----	.0011664	.0013501	.0010352	-----	.0006036	.0006892	.0005002
A bbddee	---	-----	.0026352	.0031598	-----	.0011664	.0013501	.0010352	-----	.0006036	.0006892	.0005002
a BBDDee	---	-----	.0000643	.0001656	-----	.0000115	.0000295	.0000291	-----	.0000030	.0000076	.0000073
a BBDdEe	---	-----	.0000643	.00001656	-----	.0000115	.0000295	.0000291	-----	.0000030	.0000076	.0000073
a BbDDEe	---	-----	.0000643	.0001656	-----	.0000115	.0000295	.0000291	-----	.0000030	.0000076	.0000073
a BbDdEE	---	-----	.0000643	.0001656	-----	.0000115	.0000295	.0000291	-----	.0000030	.0000076	.0000073
a BbDDEe	---	-----	.0000643	.0001656	-----	.0000115	.0000295	.0000291	-----	.0000030	.0000076	.0000073
a BbDdEE	---	-----	.0000643	.0001656	-----	.0000115	.0000295	.0000291	-----	.0000030	.0000076	.0000073
a BbDdEe	---	-----	.00226757	.0090047	.0036011	.0096117	.0036958	.0012540	.0004622	.0049015	.0018620	.0005889
a BBDdee	---	-----	.0000321	.0002239	.0004683	-----	.0000058	.0000423	.0000903	-----	.0015015	.0000112
a BbDDEe	---	-----	.0000321	.0002239	.0004683	-----	.0000058	.0000423	.0000903	-----	.0015015	.0000112
a bbdEE	---	-----	.0000321	.0002239	.0004683	-----	.0000058	.0000423	.0000903	-----	.0015015	.0000112
A bbddee	---	-----	.0026031	.0081011	.0123646	-----	.0011606	.0037896	.0059220	-----	.0018078	.0016125
a BbDdee	---	-----	.0078414	.0074605	.0059301	-----	.0034875	.0031667	.0022260	-----	.0018078	.0016125
a BbDdEe	---	-----	.0078414	.0074605	.0059301	-----	.0034875	.0031667	.0022260	-----	.0018078	.0016125
a bbdEE	---	-----	.0078414	.0074605	.0059301	-----	.0034875	.0031667	.0022260	-----	.0018078	.0016125
a Bbddee	---	-----	.0077771	.0189138	.0265400	-----	.0034760	.0088446	.0126985	-----	.0018048	.0046640
a bbDdee	---	-----	.0077771	.0189138	.0265400	-----	.0034760	.0088446	.0126985	-----	.0018048	.0046640
a bbdEE	---	-----	.0077771	.0189138	.0265400	-----	.0034760	.0088446	.0126985	-----	.0018048	.0046640
a bbddee	---	.4535145	.4190957	.3912190	.4805842	.4653922	.4525121	.4444750	.4901480	.4822930	.4755288	.4712676

Table 3.--Relative frequencies of female genotypes when native population (3 autosomal genes BBDOEE plus 1 sex-linked gene AA; female is heterogametic) is overflooded once in parental generation by $\bar{X}$ release insects (aabbdee, a-bbdee) for every native insect--Continued

Genotype	$\bar{X} = 200$				$\bar{X} = 500$				$\bar{X} = 1,000$			
	F ₁	F ₂	F ₃	F ₄	F ₁	F ₂	F ₃	F ₄	F ₁	F ₂	F ₃	F ₄
A BBDOEE	0.0000124	0.0000004	0.0000000	0.0000000	0.0000020	0.0000001	0.0000000	0.0000000	0.0000005	0.0000000	0.0000000	0.0000000
A BBdDEe	-----	.0000008	.0000001	.0000000	-----	.0000001	.0000000	.0000000	-----	.0000000	.0000000	.0000000
A BBdDEE	-----	.0000008	.0000001	.0000000	-----	.0000001	.0000000	.0000000	-----	.0000000	.0000000	.0000000
A BbDDEe	-----	.0000008	.0000001	.0000000	-----	.0000001	.0000000	.0000000	-----	.0000000	.0000000	.0000000
A BBdDee	-----	.0000004	.0000001	.0000000	-----	.0000001	.0000000	.0000000	-----	.0000000	.0000000	.0000000
A BBdDEE	-----	.0000004	.0000001	.0000000	-----	.0000001	.0000000	.0000000	-----	.0000000	.0000000	.0000000
A BbDDEe	-----	.0000004	.0000001	.0000000	-----	.0000001	.0000000	.0000000	-----	.0000000	.0000000	.0000000
A BbDDEE	-----	.0000004	.0000001	.0000000	-----	.0000001	.0000000	.0000000	-----	.0000000	.0000000	.0000000
A BbDDee	-----	.0000016	.0000005	.0000001	-----	.0000002	.0000001	.0000000	-----	.0000001	.0000000	.0000000
A BbDDEe	-----	.0000016	.0000005	.0000001	-----	.0000002	.0000001	.0000000	-----	.0000001	.0000000	.0000000
A BbDDEE	-----	.0000016	.0000005	.0000001	-----	.0000002	.0000001	.0000000	-----	.0000001	.0000000	.0000000
A BBdDEE	-----	.0000008	.0000007	.0000003	-----	.0000001	.0000001	.0000000	-----	.0000000	.0000000	.0000000
A BbDDEe	-----	.0000008	.0000007	.0000003	-----	.0000001	.0000001	.0000000	-----	.0000000	.0000000	.0000000
A BbDDEE	-----	.0000008	.0000007	.0000003	-----	.0000001	.0000001	.0000000	-----	.0000000	.0000000	.0000000
A BbDDee	-----	.0000008	.0000007	.0000003	-----	.0000001	.0000001	.0000000	-----	.0000000	.0000000	.0000000
A BBdDEE	-----	.0000008	.0000007	.0000003	-----	.0000001	.0000001	.0000000	-----	.0000000	.0000000	.0000000
A BbDDEe	-----	.0000008	.0000007	.0000003	-----	.0000001	.0000001	.0000000	-----	.0000000	.0000000	.0000000
A BbDDEE	-----	.0000008	.0000007	.0000003	-----	.0000001	.0000001	.0000000	-----	.0000000	.0000000	.0000000
a BBDOEE	-----	.0000004	.0000000	.0000000	-----	.0000001	.0000000	.0000000	-----	.0000000	.0000000	.0000000
A BbDDEe	-.0024752	.0003217	.0000448	.0000070	.0009960	.0001265	.0000165	.0000023	.0004990	.0000629	.0000080	.0000011
a BBDOEE	-----	.0000008	.0000002	.0000000	-----	.0000001	.0000000	.0000000	-----	.0000000	.0000000	.0000000
a BBdDEE	-----	.0000008	.0000002	.0000000	-----	.0000001	.0000000	.0000000	-----	.0000000	.0000000	.0000000
a BbDDEE	-----	.0000008	.0000002	.0000000	-----	.0000001	.0000000	.0000000	-----	.0000000	.0000000	.0000000
A BBddee	-----	.0000004	.0000010	.0000009	-----	.0000001	.0000002	.0000001	-----	.0000000	.0000000	.0000000
A BBdDEe	-----	.0000004	.0000010	.0000009	-----	.0000001	.0000002	.0000001	-----	.0000000	.0000000	.0000000
A bbdDEE	-----	.0000004	.0000010	.0000009	-----	.0000001	.0000002	.0000001	-----	.0000000	.0000000	.0000000
A BbDdee	-----	.0003079	.0001210	.0000392	-----	.0001243	.0000475	.0000145	-----	.0000623	.0000236	.0000070
A BbDDEe	-----	.0003079	.0001210	.0000392	-----	.0001243	.0000475	.0000145	-----	.0000623	.0000236	.0000070
A BbDDEE	-----	.0003079	.0001210	.0000392	-----	.0001243	.0000475	.0000145	-----	.0000623	.0000236	.0000070
a BBdDee	-----	.0000004	.0000003	.0000001	-----	.0000001	.0000001	.0000000	-----	.0000000	.0000000	.0000000
a BbDDEe	-----	.0000004	.0000003	.0000001	-----	.0000001	.0000001	.0000000	-----	.0000000	.0000000	.0000000
a bbdDEE	-----	.0000004	.0000003	.0000001	-----	.0000001	.0000001	.0000000	-----	.0000000	.0000000	.0000000
a BBdDEe	-----	.0000015	.0000013	.0000006	-----	.0000002	.0000002	.0000001	-----	.0000001	.0000001	.0000000
a BbDDEe	-----	.0000015	.0000013	.0000006	-----	.0000002	.0000002	.0000001	-----	.0000001	.0000001	.0000000
a BbDDEE	-----	.0000015	.0000013	.0000006	-----	.0000002	.0000002	.0000001	-----	.0000001	.0000001	.0000000
A BbDdee	-----	.0003071	.0003481	.0002449	-----	.0001241	.0001401	.0000966	-----	.0000623	.0000702	.0000481
A bbdDee	-----	.0003071	.0003481	.0002449	-----	.0001241	.0001401	.0000966	-----	.0000623	.0000702	.0000481
A bbdDEe	-----	.0003071	.0003481	.0002449	-----	.0001241	.0001401	.0000966	-----	.0000623	.0000702	.0000481
a BBdDee	-----	.0000008	.0000019	.0000018	-----	.0000001	.0000003	.0000003	-----	.0000000	.0000001	.0000001
a BbDDEe	-----	.0000008	.0000019	.0000018	-----	.0000001	.0000003	.0000003	-----	.0000000	.0000001	.0000001
a BbDDEE	-----	.0000008	.0000019	.0000018	-----	.0000001	.0000003	.0000003	-----	.0000000	.0000001	.0000001
a BbDDee	-----	.0000008	.0000019	.0000018	-----	.0000001	.0000003	.0000003	-----	.0000000	.0000001	.0000001
a bbdDEe	-----	.0000008	.0000019	.0000018	-----	.0000001	.0000003	.0000003	-----	.0000000	.0000001	.0000001
a bbdDEE	-----	.0000008	.0000019	.0000018	-----	.0000001	.0000003	.0000003	-----	.0000000	.0000001	.0000001
a BbDDEe	-.0024752	.0009343	.0002842	.0000842	.0009960	.0003745	.0001111	.0000311	.0004990	.0001874	.0000551	.0000151
a BBdDee	-----	.0000004	.0000029	.0000062	-----	.0000001	.0000005	.0000010	-----	.0000000	.0000001	.0000003
a bbdDee	-----	.0000004	.0000029	.0000062	-----	.0000001	.0000005	.0000010	-----	.0000000	.0000001	.0000003
a bbdDEE	-----	.0000004	.0000029	.0000062	-----	.0000001	.0000005	.0000010	-----	.0000000	.0000001	.0000003
A bbddee	-----	.0003067	.001027	.0016235	-----	.0001241	.0004173	.0006616	-----	.0000623	.0002098	.0003329
a BbDDee	-----	.0009205	.0008133	.0005254	-----	.0003723	.0003270	.0002072	-----	.0001868	.0001638	.0001031
a BbDDEe	-----	.0009205	.0008133	.0005254	-----	.0003723	.0003270	.0002072	-----	.0001868	.0001638	.0001031
a bbdDEe	-----	.0009205	.0008133	.0005254	-----	.0003723	.0003270	.0002072	-----	.0001868	.0001638	.0001031
a Bbddee	-----	.0009197	.0023954	.0034796	-----	.0003721	.0009738	.0014179	-----	.0001868	.0004895	.0007133
a bbdDee	-----	.0009197	.0023954	.0034796	-----	.0003721	.0009738	.0014179	-----	.0001868	.0004895	.0007133
a bbdDEe	-----	.0009197	.0023954	.0034796	-----	.0003721	.0009738	.0014179	-----	.0001868	.0004895	.0007133
a bbddee	.4950372	.4910426	.4875758	.4853811	.4980059	.4963919	.4949640	.4940906	.4990014	.4981916	.4974845	.4970345

Table 35.--Relative frequencies of genotypes when native population (aa) is overflooded in parental, F₁, F₂, and F₃ generations by X release insects for every native insect

Genotype	F ₁	F ₂	F ₃	F ₄
<u>X</u> = 1				
aa -----	0.2500000	0.0625000	0.0156250	0.0039063
Aa -----	.5000000	.3750000	.2187500	.1171875
AA -----	.2500000	.5625000	.7656250	.8789063
<u>X</u> = 2				
aa -----	.1111111	.0204082	.0044444	.0010406
Aa -----	.4444444	.2448981	.1244445	.0643498
AA -----	.4444444	.7346942	.8711112	.9365246
<u>X</u> = 3				
aa -----	.0625000	.0100000	.0020661	.0004726
Aa -----	.3750000	.1800000	.0867769	.0425331
AA -----	.5625000	.8100000	.9111573	.9569945
<u>X</u> = 4				
aa -----	.0400000	.0059172	.0011891	.0002687
Aa -----	.3200000	.1420119	.0665874	.0322494
AA -----	.6400000	.8520712	.9322236	.9674819
<u>X</u> = 5				
aa -----	.0277778	.0039062	.0007716	.0001731
Aa -----	.2777777	.1171875	.0540123	.0259695
AA -----	.6944444	.8789064	.9452161	.9738574
<u>X</u> = 10				
aa -----	.0082645	.0010406	.0001984	.0000439
Aa -----	.1652892	.0643495	.0277723	.0131573
AA -----	.8264462	.9365245	.9720310	.9867996
<u>X</u> = 50				
aa -----	.0003845	.0000439	.0000081	.0000018
Aa -----	.0384467	.0131573	.0056818	.0026596
AA -----	.9611687	.9867991	.9943102	.9973388
<u>X</u> = 100				
aa -----	.0000980	.0000110	.0000020	.0000004
Aa -----	.0196059	.0066224	.0028490	.0013316
AA -----	.9802959	.9933666	.9971490	.9986680
<u>X</u> = 200				
aa -----	.0000248	.0000028	.0000005	.0000001
Aa -----	.0099007	.0033223	.0014265	.0006662
AA -----	.9900745	.9966766	.9985736	.9993343
<u>X</u> = 1,000				
aa -----	.0000010	.0000001	.0000000	.0000000
Aa -----	.0019960	.0006662	.0002856	.0001333
AA -----	.9980029	.9993339	.9997144	.9998668

Table 3b.--Relative frequencies of genotypes when native population (AABB) is overflooded in parental, F₁, F₂, and F₃ generations by X release insects (aabb) for every native insect

Genera- tion	AABB	AaBB	AABb	AaBb	aaBB	AAbb	aaBb	Aabb	aabb
<u>X</u> = 1									
F ₁ ---	0.2500000	-----	-----	0.5000000	-----	-----	-----	-----	0.2500000
F ₂ ---	.0351563	.00234375	.00234375	.2656250	.00039063	.00039063	.00859375	.00859375	.4726563
F ₃ ---	.0039063	.0078125	.0078125	.1093750	.0039063	.0039063	.1015625	.1015625	.6601563
F ₄ ---	.0003815	.0016785	.0016785	.0386353	.0018463	.0018463	.0768738	.0768738	.8001862
<u>X</u> = 2									
F ₁ ---	.1111111	-----	-----	.4444444	-----	-----	-----	-----	.4444444
F ₂ ---	.0090703	.0090703	.0090703	.1587302	.0022676	.0022676	.0770975	.0770975	.6553288
F ₃ ---	.0007281	.0021416	.0021416	.0513782	.0015747	.0015747	.0709247	.0709247	.7986117
F ₄ ---	.0000578	.0003749	.0003749	.0155576	.0006078	.0006078	.0465025	.0465025	.8894141
<u>X</u> = 3									
F ₁ ---	.0625000	-----	-----	.3750000	-----	-----	-----	-----	.5625000
F ₂ ---	.0039063	.0046875	.0046875	.1106250	.0014063	.0014063	.0646875	.0646875	.7439063
F ₃ ---	.0002715	.0009549	.0009549	.0321810	.0008397	.0008397	.0536409	.0536409	.8566765
F ₄ ---	.0000197	.0001535	.0001535	.0091212	.0002995	.0002995	.0332584	.0332584	.9234365
<u>X</u> = 4									
F ₁ ---	.0400000	-----	-----	.3200000	-----	-----	-----	-----	.6400000
F ₂ ---	.0021302	.0028402	.0028402	.0842604	.0009467	.0009467	.0549112	.0549112	.7962130
F ₃ ---	.0001362	.0005325	.0005325	.0230455	.0005204	.0005204	.0430094	.0430094	.8886938
F ₄ ---	.0000093	.0000815	.0000815	.0062878	.0001779	.0001779	.0258801	.0258801	.9414239
<u>X</u> = 5									
F ₁ ---	.0277777	-----	-----	.2777777	-----	-----	-----	-----	.6944444
F ₂ ---	.0013292	.0018989	.0018989	.0678168	.0006782	.0006782	.0474718	.0474718	.8307563
F ₃ ---	.0000805	.0003374	.0003374	.0178115	.0003537	.0003537	.0358634	.0358634	.9089989
F ₄ ---	.0000053	.0000501	.0000501	.0047391	.0001177	.0001177	.0211804	.0211804	.9525592
<u>X</u> = 10									
F ₁ ---	.0082645	-----	-----	.1652893	-----	-----	-----	-----	.8264463
F ₂ ---	.0003096	.0005160	.0005160	.0339694	.0002150	.0002150	.0279495	.0279495	.9083600
F ₃ ---	.0000166	.0000815	.0000815	.0081413	.0001003	.0001003	.0195494	.0195494	.9523796
F ₄ ---	.0000010	.0000113	.0000113	.0020448	.0000316	.0000316	.0111012	.0111012	.9756660
<u>X</u> = 50									
F ₁ ---	.0005845	-----	-----	.0384468	-----	-----	-----	-----	.9611688
F ₂ ---	.0000114	.0000219	.0000219	.0067068	.0000105	.0000105	.0064286	.0064286	.9803597
F ₃ ---	.0000005	.0000031	.0000031	.0014729	.0000045	.0000045	.0042057	.0042057	.9900999
F ₄ ---	.0000000	.0000004	.0000004	.0003494	.0000013	.0000013	.0023097	.0023097	.9950276
<u>X</u> = 100									
F ₁ ---	.0000980	-----	-----	.0196059	-----	-----	-----	-----	.9802960
F ₂ ---	.0000028	.0000055	.0000055	.0033439	.0000027	.0000027	.0032730	.0032730	.9900907
F ₃ ---	.0000001	.0000008	.0000008	.0007255	.0000011	.0000011	.0021227	.0021227	.9950251
F ₄ ---	.0000000	.0000001	.0000001	.0001707	.0000003	.0000003	.0011607	.0011607	.9975069
<u>X</u> = 200									
F ₁ ---	.0000248	-----	-----	.0099007	-----	-----	-----	-----	.9900745
F ₂ ---	.0000007	.0000014	.0000014	.0016694	.0000007	.0000007	.0016515	.0016515	.9950228
F ₃ ---	.0000000	.0000002	.0000002	.0003600	.0000003	.0000003	.0010664	.0010664	.9975063
F ₄ ---	.0000000	.0000000	.0000000	.0000844	.0000001	.0000001	.0005818	.0005818	.9987517
<u>X</u> = 1,000									
F ₁ ---	.0000010	-----	-----	.0019960	-----	-----	-----	-----	.9980030
F ₂ ---	.0000000	.0000000	.0000000	.0003334	.0000000	.0000000	.0003327	.0003327	.9990009
F ₃ ---	.0000000	.0000000	.0000000	.0000715	.0000000	.0000000	.0002141	.0002141	.9995003
F ₄ ---	.0000000	.0000000	.0000000	.0000167	.0000000	.0000000	.0001166	.0001166	.9997501

Table 37.--Relative frequencies of genotypes when native population (AABDD) is overflooded in parental, F_1 , F_2 , and F_3 generations by $\bar{X}$ release insects (aabbdd) for every native insect

Genotype	$\bar{X}_1 = 1$				$\bar{X}_2 = 2$				$\bar{X}_3 = 3$				$\bar{X}_4 = 4$			
	F_1	F_2	F_3	F_4	F_1	F_2	F_3	F_4	F_1	F_2	F_3	F_4	F_1	F_2	F_3	F_4
0, 2500000	0.0244141	0.0013771	0.0000573	0.0000050	0.1111111	0.0051020	0.0001715	0.0000050	0.0625000	0.0019141	0.0000504	0.0000012	0.0400000	0.0009467	0.0000215	0.0000005
AAABBD	---	0.007656	0.001885	0.001811	---	0.0034014	0.0003638	0.000240	---	0.016406	0.0001332	0.0000074	---	0.0009467	0.0000653	0.0000033
AAABDd	---	0.007656	0.001885	0.001811	---	0.0034014	0.0003638	0.000240	---	0.016406	0.0001332	0.0000074	---	0.0009467	0.0000653	0.0000033
AAABSD	---	0.007656	0.001885	0.001811	---	0.0034014	0.0003638	0.000240	---	0.016406	0.0001332	0.0000074	---	0.0009467	0.0000653	0.0000033
AAABDD	---	0.007656	0.001885	0.001811	---	0.0034014	0.0003638	0.000240	---	0.016406	0.0001332	0.0000074	---	0.0009467	0.0000653	0.0000033
AAABBD	---	0.009766	0.0006447	0.001431	---	0.005669	0.0001929	0.000288	---	0.003516	0.0000879	0.0000110	---	0.002367	0.0000494	0.0000056
AAABDd	---	0.009766	0.0006447	0.001431	---	0.005669	0.0001929	0.000288	---	0.003516	0.0000879	0.0000110	---	0.002367	0.0000494	0.0000056
AAABSD	---	0.009766	0.0006447	0.001431	---	0.005669	0.0001929	0.000288	---	0.003516	0.0000879	0.0000110	---	0.002367	0.0000494	0.0000056
AAABDD	---	0.009766	0.0006447	0.001431	---	0.005669	0.0001929	0.000288	---	0.003516	0.0000879	0.0000110	---	0.002367	0.0000494	0.0000056
AAABDd	---	0.117188	0.0040436	0.0007556	---	0.0045351	0.0010614	0.0001439	---	0.0023437	0.0004542	0.0000533	---	0.014201	0.0002453	0.0000264
AAABDD	---	0.117188	0.0040436	0.0007556	---	0.0045351	0.0010614	0.0001439	---	0.0023437	0.0004542	0.0000533	---	0.014201	0.0002453	0.0000264
AAABSD	---	0.117188	0.0040436	0.0007556	---	0.0045351	0.0010614	0.0001439	---	0.0023437	0.0004542	0.0000533	---	0.014201	0.0002453	0.0000264
AAABDD	---	0.117188	0.0040436	0.0007556	---	0.0045351	0.0010614	0.0001439	---	0.0023437	0.0004542	0.0000533	---	0.014201	0.0002453	0.0000264
AAABDd	---	0.019531	0.001885	0.0007418	---	0.0011338	0.0007165	0.0002070	---	0.0007031	0.0003675	0.0000928	---	0.004734	0.0002219	0.0000518
AAABDD	---	0.019531	0.001885	0.0007418	---	0.0011338	0.0007165	0.0002070	---	0.0007031	0.0003675	0.0000928	---	0.004734	0.0002219	0.0000518
AAABSD	---	0.019531	0.001885	0.0007418	---	0.0011338	0.0007165	0.0002070	---	0.0007031	0.0003675	0.0000928	---	0.004734	0.0002219	0.0000518
AAABDd	---	0.019531	0.001885	0.0007418	---	0.0011338	0.0007165	0.0002070	---	0.0007031	0.0003675	0.0000928	---	0.004734	0.0002219	0.0000518
AAABDD	---	0.019531	0.001885	0.0007418	---	0.0011338	0.0007165	0.0002070	---	0.0007031	0.0003675	0.0000928	---	0.004734	0.0002219	0.0000518
AAABDd	---	0.019531	0.001885	0.0007418	---	0.0011338	0.0007165	0.0002070	---	0.0007031	0.0003675	0.0000928	---	0.004734	0.0002219	0.0000518
AAABDD	---	0.019531	0.001885	0.0007418	---	0.0011338	0.0007165	0.0002070	---	0.0007031	0.0003675	0.0000928	---	0.004734	0.0002219	0.0000518
AAABDd	---	0.210935	0.632019	0.0152963	0.4444444	0.1156462	0.0248789	0.0047540	0.3750000	0.0759375	0.0039714	0.0023954	0.3200000	0.0553846	0.0092709	0.0014893
AAABDd	---	0.009766	0.013771	0.0009614	---	0.003569	0.0006653	0.0003720	---	0.0003516	0.0003843	0.0001957	---	0.002367	0.0002491	0.0001204
AAABDd	---	0.009766	0.013771	0.0009614	---	0.003569	0.0006653	0.0003720	---	0.0003516	0.0003843	0.0001957	---	0.002367	0.0002491	0.0001204
AAABDd	---	0.009766	0.013771	0.0009614	---	0.003569	0.0006653	0.0003720	---	0.0003516	0.0003843	0.0001957	---	0.002367	0.0002491	0.0001204
AAABDd	---	0.009766	0.013771	0.0009614	---	0.003569	0.0006653	0.0003720	---	0.0003516	0.0003843	0.0001957	---	0.002367	0.0002491	0.0001204
AAABDd	---	0.0429688	0.0421295	0.0225832	---	0.0385487	0.0254377	0.0106596	---	0.0323437	0.0177554	0.0066725	---	0.0274556	0.0135291	0.0047720
AAABDd	---	0.0429688	0.0421295	0.0225832	---	0.0385487	0.0254377	0.0106596	---	0.0323437	0.0177554	0.0066725	---	0.0274556	0.0135291	0.0047720
AAABDd	---	0.0429688	0.0421295	0.0225832	---	0.0385487	0.0254377	0.0106596	---	0.0323437	0.0177554	0.0066725	---	0.0274556	0.0135291	0.0047720
AAABDd	---	0.0429688	0.0421295	0.0225832	---	0.0385487	0.0254377	0.0106596	---	0.0323437	0.0177554	0.0066725	---	0.0274556	0.0135291	0.0047720
AAABDd	---	0.0410156	0.0575485	0.0535486	---	0.0374150	0.0447704	0.0356358	---	0.0316406	0.0355180	0.0264931	---	0.0269822	0.0292582	0.0210561
AAABDd	---	0.0410156	0.0575485	0.0535486	---	0.0374150	0.0447704	0.0356358	---	0.0316406	0.0355180	0.0264931	---	0.0269822	0.0292582	0.0210561
AAABDd	---	0.0410156	0.0575485	0.0535486	---	0.0374150	0.0447704	0.0356358	---	0.0316406	0.0355180	0.0264931	---	0.0269822	0.0292582	0.0210561
AAABDd	---	0.0410156	0.0575485	0.0535486	---	0.0374150	0.0447704	0.0356358	---	0.0316406	0.0355180	0.0264931	---	0.0269822	0.0292582	0.0210561
AAABDd	---	0.4306641	0.6012306	0.7456736	0.4444444	0.6173472	0.7531792	0.8534113	0.5652500	0.7119137	0.8207779	0.8967518	0.6400000	0.7689942	0.8591886	0.9202501

Table 37.--Relative frequencies of genotypes when native population (AABBDD) is overflooded in parental, F₁, F₂, and F₃ generations by X release insects (aabbdd) for every native insect--Continued

Genotype	<u>X</u> = 200				<u>X</u> = 1,000			
	F ₁	F ₂	F ₃	F ₄	F ₁	F ₂	F ₃	F ₄
AABBDD---	0.0000248	0.0000002	0.0000000	0.0000000	0.0000010	0.0000001	0.0000000	0.0000000
AABBdd---	-----	.0000003	.0000000	.0000000	-----	.0000001	.0000000	.0000000
AAbbdd---	-----	.0000003	.0000000	.0000000	-----	.0000001	.0000000	.0000000
AaBBDD---	-----	.0000003	.0000000	.0000000	-----	.0000001	.0000000	.0000000
AABBdd---	-----	.0000002	.0000000	.0000000	-----	.0000000	.0000000	.0000000
AAbbdd---	-----	.0000002	.0000000	.0000000	-----	.0000000	.0000000	.0000000
aaBBDD---	-----	.0000002	.0000000	.0000000	-----	.0000000	.0000000	.0000000
AaBbDd---	-----	.0000007	.0000001	.0000001	-----	.0000000	.0000000	.0000000
AaBBdd---	-----	.0000007	.0000001	.0000001	-----	.0000000	.0000000	.0000000
AaBbDD---	-----	.0000007	.0000001	.0000001	-----	.0000000	.0000000	.0000000
AABbdd---	-----	.0000003	.0000001	.0000000	-----	.0000000	.0000000	.0000000
AAbbdd---	-----	.0000003	.0000001	.0000000	-----	.0000000	.0000000	.0000000
AaBBdd---	-----	.0000003	.0000001	.0000000	-----	.0000000	.0000000	.0000000
AabbDD---	-----	.0000003	.0000001	.0000000	-----	.0000000	.0000000	.0000000
aaBBdd---	-----	.0000003	.0000001	.0000000	-----	.0000000	.0000000	.0000000
aaBbDD---	-----	.0000003	.0000001	.0000000	-----	.0000000	.0000000	.0000000
AaBbDd---	.0099007	.0008429	.0000916	.0000108	.0019960	.0001670	.0000180	.0000021
AAbbdd---	-----	.0000002	.0000002	.0000001	-----	.0000001	.0000001	.0000000
aaBBdd---	-----	.0000002	.0000002	.0000001	-----	.0000001	.0000001	.0000000
aabbDD---	-----	.0000002	.0000002	.0000001	-----	.0000001	.0000001	.0000000
AaBbdd---	-----	.0008257	.0002683	.0000735	-----	.0001664	.0000536	.0000146
AabbDd---	-----	.0008257	.0002683	.0000735	-----	.0001664	.0000536	.0000146
aaBbDd---	-----	.0008257	.0002683	.0000735	-----	.0001664	.0000536	.0000146
Aabbdd---	-----	.0008254	.0007980	.0005083	-----	.0001663	.0001605	.0001020
aaBbdd---	-----	.0008254	.0007980	.0005083	-----	.0001663	.0001605	.0001020
aabbDd---	-----	.0008254	.0007980	.0005083	-----	.0001663	.0001605	.0001020
aabbdd---	.9900745	.9941983	.9967092	.9982441	.9980003	.9988348	.9993399	.9996479

*able 38...Relative frequencies of genotypes when native population (AABBDDEE) is overflooded in parental, F₁, F₂, and F₃ generations by X release insects (aabbddde) for every native insect

[illegible]

[illegible]

[illegible]

Table 3B.--Relative frequencies of genotypes when native population (AABBDDEE) is overflooded in parental, F₁, F₂, and F₃ generations by X release insects (aabbdd ee) for every native insect--Continued

[illegible]

[illegible]

Table 39.--Relative frequencies of male genotypes when native population (3 autosomal genes BEDDEE plus 1 sex-linked gene AA; female is heterogametic) is overflooded by X release insects (aabbdee, a-bbdee) for every native insect--Continued

Genotype	X = 4				X = 5				X = 10			
	F1	F2	F3	F4	F1	F2	F3	F4	F1	F2	F3	F4
AABBDDEE--	0,0200000	0,0002663	0,0000024	0,0000000	0,0138889	0,0001433	0,0000011	0,0000000	0,0041322	0,0000218	0,0000001	0,0000000
AABBDDee--	-----	.0001175	.0000054	.0000001	-----	.0001102	.0000028	.0000000	-----	.0000242	.0000004	.0000000
AABBDDEE--	-----	.0001175	.0000054	.0000001	-----	.0001102	.0000028	.0000000	-----	.0000242	.0000004	.0000000
AABBDDeE--	-----	.0001175	.0000054	.0000001	-----	.0001102	.0000028	.0000000	-----	.0000242	.0000004	.0000000
AaBBDDEE--	-----	.0001175	.0000054	.0000001	-----	.0001102	.0000028	.0000000	-----	.0000242	.0000004	.0000000
AABBDDee--	-----	.0000296	.0000030	.0000001	-----	.0000212	.0000018	.0000001	-----	.0000067	.0000004	.0000000
AABBDdEe--	-----	.0000296	.0000030	.0000001	-----	.0000212	.0000018	.0000001	-----	.0000067	.0000004	.0000000
AabbDDEE--	-----	.0000296	.0000030	.0000001	-----	.0000212	.0000018	.0000001	-----	.0000067	.0000004	.0000000
aabbDDEE--	-----	.0000296	.0000030	.0000001	-----	.0000212	.0000018	.0000001	-----	.0000067	.0000004	.0000000
AABBDDee--	-----	.0002367	.0000160	.0000006	-----	.0001526	.0000091	.0000003	-----	.0000376	.0000016	.0000000
AABBDDeE--	-----	.0002367	.0000160	.0000006	-----	.0001526	.0000091	.0000003	-----	.0000376	.0000016	.0000000
AABBDdEe--	-----	.0002367	.0000160	.0000006	-----	.0001526	.0000091	.0000003	-----	.0000376	.0000016	.0000000
AaBBDDEE--	-----	.0002367	.0000160	.0000006	-----	.0001526	.0000091	.0000003	-----	.0000376	.0000016	.0000000
AaBBDdEe--	-----	.0002367	.0000160	.0000006	-----	.0001526	.0000091	.0000003	-----	.0000376	.0000016	.0000000
AaBBDDEE--	-----	.0002367	.0000160	.0000006	-----	.0001526	.0000091	.0000003	-----	.0000376	.0000016	.0000000
AABBDDee--	-----	.0000592	.0000112	.0000009	-----	.0000424	.0000070	.0000005	-----	.0000134	.0000016	.0000001
AABBDdEe--	-----	.0000592	.0000112	.0000009	-----	.0000424	.0000070	.0000005	-----	.0000134	.0000016	.0000001
AABBDDEE--	-----	.0000592	.0000112	.0000009	-----	.0000424	.0000070	.0000005	-----	.0000134	.0000016	.0000001
AABBDdEE--	-----	.0000592	.0000112	.0000009	-----	.0000424	.0000070	.0000005	-----	.0000134	.0000016	.0000001
AabbDDEE--	-----	.0000592	.0000112	.0000009	-----	.0000424	.0000070	.0000005	-----	.0000134	.0000016	.0000001
AabbDdEE--	-----	.0000592	.0000112	.0000009	-----	.0000424	.0000070	.0000005	-----	.0000134	.0000016	.0000001
AaBBDDEE--	-----	.0000592	.0000112	.0000009	-----	.0000424	.0000070	.0000005	-----	.0000134	.0000016	.0000001
AaBBDdEE--	-----	.0000592	.0000112	.0000009	-----	.0000424	.0000070	.0000005	-----	.0000134	.0000016	.0000001
aabbDDEE--	-----	.0000592	.0000112	.0000009	-----	.0000424	.0000070	.0000005	-----	.0000134	.0000016	.0000001
aabbDdEE--	-----	.0000592	.0000112	.0000009	-----	.0000424	.0000070	.0000005	-----	.0000134	.0000016	.0000001
AABBDDee--	-----	.0003550	.0000582	.0000046	-----	.0002374	.0000351	.0000025	-----	.0000645	.0000074	.0000004
AABBDdEe--	-----	.0003550	.0000582	.0000046	-----	.0002374	.0000351	.0000025	-----	.0000645	.0000074	.0000004
AABBDDEE--	-----	.0003550	.0000582	.0000046	-----	.0002374	.0000351	.0000025	-----	.0000645	.0000074	.000000

[illegible]

[illegible]

Table 40.--Relative frequencies of female genotypes when native population (3 autosomal genes BBDDEE plus 1 sex-linked gene AA; female is heterogametic) is overflooded by X release insects (aabbdde, a-bbddee) for every native insect

Genotype	N = 1				N = 2				N = 3			
	F ₁	F ₂	F ₃	F ₄	F ₁	F ₂	F ₃	F ₄	F ₁	F ₂	F ₃	F ₄
a BbDdEe	0.125000	0.109863	0.070666	0.000131	0.055555	0.002125	0.000048	0.000009	0.031250	0.000750	0.000012	0.000002
A BbDdEe	-----	0.034180	0.05412	0.00363	-----	0.011338	0.000087	0.000037	-----	0.005273	0.000293	0.000010
A BbDdEe	-----	0.03418	0.05412	0.00363	-----	0.011338	0.000087	0.000037	-----	0.005273	0.000293	0.000010
A BbDdEe	-----	0.034180	0.05412	0.00363	-----	0.011338	0.000087	0.000037	-----	0.005273	0.000293	0.000010
A BbDdEe	-----	0.000241	0.001518	0.000246	-----	0.001417	0.000039	0.000039	-----	0.000879	0.000164	0.000013
A BbDdEe	-----	0.000241	0.001519	0.000246	-----	0.001417	0.000039	0.000039	-----	0.000879	0.000164	0.000013
A BbDdEe	-----	0.000241	0.001518	0.000246	-----	0.001417	0.000039	0.000039	-----	0.000879	0.000164	0.000013
A BbDdEe	-----	0.039063	0.010195	0.001325	-----	0.014172	0.002284	0.000198	-----	0.007031	0.000890	0.000064
A BbDdEe	-----	0.039063	0.010195	0.001325	-----	0.014172	0.002284	0.000198	-----	0.007031	0.000890	0.000064
A BbDdEe	-----	0.039063	0.010195	0.001325	-----	0.014172	0.002284	0.000198	-----	0.007031	0.000890	0.000064
A BbDdEe	-----	0.004883	0.003924	0.001106	-----	0.002834	0.001301	0.000244	-----	0.001758	0.000618	0.000096
A BbDdEe	-----	0.004883	0.003924	0.001106	-----	0.002834	0.001301	0.000244	-----	0.001758	0.000618	0.000096
A BbDdEe	-----	0.004883	0.003924	0.001106	-----	0.002834	0.001301	0.000244	-----	0.001758	0.000618	0.000096
A BbDdEe	-----	0.004883	0.003924	0.001106	-----	0.002834	0.001301	0.000244	-----	0.001758	0.000618	0.000096
A BbDdEe	-----	0.004883	0.003924	0.001106	-----	0.002834	0.001301	0.000244	-----	0.001758	0.000618	0.000096
A BbDdEe	-----	0.004883	0.003924	0.001106	-----	0.002834	0.001301	0.000244	-----	0.001758	0.000618	0.000096
a BbDdEe	-----	0.012267	0.002227	0.000155	-----	0.004252	0.000037	0.000016	-----	0.002051	0.000012	0.000004
A BbDdEe	1.500000	0.488281	0.113659	0.019150	1.111111	0.246598	0.037339	0.004570	0.937500	0.152344	0.018708	0.001972
a BbDdEe	-----	0.011648	0.000401	0.000543	-----	0.005669	0.000932	0.000083	-----	0.002930	0.000373	0.000027
a BbDdEe	-----	0.011648	0.000401	0.000543	-----	0.005669	0.000932	0.000083	-----	0.002930	0.000373	0.000027
a BbDdEe	-----	0.011648	0.000401	0.000543	-----	0.005669	0.000932	0.000083	-----	0.002930	0.000373	0.000027
A BbDdEe	-----	0.000241	0.000491	0.001218	-----	0.001417	0.001062	0.000378	-----	0.000879	0.000577	0.000178
A BbDdEe	-----	0.000241	0.000491	0.001218	-----	0.001417	0.001062	0.000378	-----	0.000879	0.000577	0.000178
A BbDdEe	-----	0.000241	0.000491	0.001218	-----	0.001417	0.001062	0.000378	-----	0.000879	0.000577	0.000178
A BbDdEe	-----	0.005859	0.005436	0.021543	-----	0.051020	0.027881	0.007837	-----	0.042187	0.017601	0.004219
A BbDdEe	-----	0.005859	0.005436	0.021543	-----	0.051020	0.027881	0.007837	-----	0.042187	0.017601	0.004219
A BbDdEe	-----	0.005859	0.005436	0.021543	-----	0.051020	0.027881	0.007837	-----	0.042187	0.017601	0.004219
a BbDdEe	-----	0.000241	0.0001705	0.0000470	-----	0.001417	0.0000572	0.0000105	-----	0.000879	0.0000276	0.0000042
a BbDdEe	-----	0.000241	0.0001705	0.0000470	-----	0.001417	0.0000572	0.0000105	-----	0.000879	0.0000276	0.0000042
a BbDdEe	-----	0.000241	0.0001706	0.0000470	-----	0.001417	0.0000572	0.0000105	-----	0.000879	0.0000276	0.0000042
A BbDdEe	-----	0.019531	0.010023	0.002452	-----	0.008503	0.003023	0.000522	-----	0.004687	0.001381	0.0000202
A BbDdEe	-----	0.019531	0.010023	0.002452	-----	0.008503	0.003023	0.000522	-----	0.004687	0.001381	0.0000202
A BbDdEe	-----	0.019531	0.010023	0.002452	-----	0.008503	0.003023	0.000522	-----	0.004687	0.001381	0.0000202
A BbDdEe	-----	0.0053711	0.0056453	0.037518	-----	0.048186	0.037995	0.019603	-----	0.040430	0.028007	0.012829
A BbDdEe	-----	0.0053711	0.0056453	0.037518	-----	0.048186	0.037995	0.019603	-----	0.040430	0.028007	0.012829
A BbDdEe	-----	0.0053711	0.0056453	0.037518	-----	0.048186	0.037995	0.019603	-----	0.040430	0.028007	0.012829
a BbDdEe	-----	0.0004883	0.0005500	0.002603	-----	0.002834	0.002281	0.000791	-----	0.001758	0.001220	0.000367
a BbDdEe	-----	0.0004883	0.0005500	0.002603	-----	0.002834	0.002281	0.000791	-----	0.001758	0.001220	0.000367
a BbDdEe	-----	0.0004883	0.0005500	0.002603	-----	0.002834	0.002281	0.000791	-----	0.001758	0.001220	0.000367
a BbDdEe	-----	0.0004883	0.0005500	0.002603	-----	0.002834	0.002281	0.000791	-----	0.001758	0.001220	0.000367
a BbDdEe	-----	0.0004883	0.0005500	0.002603	-----	0.002834	0.002281	0.000791	-----	0.001758	0.001220	0.000367
a BbDdEe	-----	0.0004883	0.0005500	0.002603	-----	0.002834	0.002281	0.000791	-----	0.001758	0.001220	0.000367
a BbDdEe	-----	0.0004883	0.0005500	0.002603	-----	0.002834	0.002281	0.000791	-----	0.001758	0.001220	0.000367
a BbDdEe	1.250000	0.566406	0.202351	0.057327	1.111111	0.331632	0.087049	0.019198	0.937500	0.227344	0.051142	0.010004
a BbDdEe	-----	0.000241	0.0004394	0.003589	-----	0.001417	0.002265	0.001482	-----	0.000880	0.001344	0.000801
a BbDdEe	-----	0.000241	0.0004394	0.003589	-----	0.001417	0.002265	0.001482	-----	0.000880	0.001344	0.000801
a BbDdEe	-----	0.000241	0.0004394	0.003589	-----	0.001417	0.002265	0.001482	-----	0.000880	0.001344	0.000801
A BbDdEe	-----	0.051270	0.091813	0.099943	-----	0.046769	0.076196	0.070967	-----	0.039551	0.062132	0.054203
a BbDdEe	-----	0.156250	0.156279	0.091370	-----	0.141723	0.099302	0.045459	-----	0.119531	0.071173	0.029142
a BbDdEe	-----	0.156250	0.156279	0.091370	-----	0.141723	0.099302	0.045459	-----	0.119531	0.071173	0.029142
a BbDdEe	-----	0.156250	0.156279	0.091370	-----	0.141723	0.099302	0.045459	-----	0.119531	0.071173	0.029142
a BbDdEe	-----	0.151367	0.231290	0.230223	-----	0.138889	0.185852	0.158571	-----	0.117773	0.149581	0.119632
a BbDdEe	-----	0.151367	0.231290	0.230223	-----	0.138889	0.185852	0.158571	-----	0.117773	0.149581	0.119632
a BbDdEe	-----	0.151367	0.231290	0.230223	-----	0.138889	0.185852	0.158571	-----	0.117773	0.149581	0.119632
a BbDdEe	1.250000	0.2102051	0.2914341	0.3628430	1.222222	0.3039966	0.3689681	0.4196078	2.812500	0.3520019	0.4041737	0.4429544

Table 40.--Relative frequencies of female genotypes when native population (3 autosomal genes BBDDEE plus 1 sex-linked gene AA; female is heterogametic) is overflooded by $\bar{X}$ release insects (aabbdee, a-bbdee) for every native insect--
Continued

Genotype	$\bar{X} = 4$				$\bar{X} = 5$				$\bar{X} = 10$			
	F ₁	F ₂	F ₃	F ₄	F ₁	F ₂	F ₃	F ₄	F ₁	F ₂	F ₃	F ₄
A BBDDEE--0.020000	0.0003550	0.0000051	0.0000001	0.0140000	0.0001934	0.0000025	0.0000000	0.0041322	0.0000339	0.0000003	0.0000000	
A BBDDee--	-----	.0000959	.0000134	.0000004	-----	.0001865	.0000073	.0000002	-----	.0000430	.0000012	.0000000
A BBDDEE--	-----	.0002959	.0000134	.0000004	-----	.0001865	.0000073	.0000002	-----	.0000430	.0000012	.0000000
A BbDDEE--	-----	.0002959	.0000134	.0000004	-----	.0001865	.0000073	.0000002	-----	.0000430	.0000012	.0000000
A BBDDee--	-----	.0000592	.0000086	.0000006	-----	.0000424	.0000053	.0000003	-----	.0000134	.0000011	.0000001
A BbDDEE--	-----	.0000592	.0000086	.0000006	-----	.0000424	.0000053	.0000003	-----	.0000134	.0000011	.0000001
A bbdDEE--	-----	.0000592	.0000086	.0000006	-----	.0000424	.0000053	.0000003	-----	.0000134	.0000011	.0000001
A BBDDee--	-----	.0004142	.0000451	.0000029	-----	.0002713	.0000266	.0000016	-----	.0000699	.0000053	.0000003
A BbDDEE--	-----	.0004142	.0000451	.0000029	-----	.0002713	.0000266	.0000016	-----	.0000699	.0000053	.0000003
A BbDDEE--	-----	.0004142	.0000451	.0000029	-----	.0002713	.0000266	.0000016	-----	.0000699	.0000053	.0000003
A BBDDEE--	-----	.0001183	.0000355	.0000050	-----	.0000848	.0000228	.0000030	-----	.0000269	.0000057	.0000006
A BbDDEE--	-----	.0001183	.0000355	.0000050	-----	.0000848	.0000228	.0000030	-----	.0000269	.0000057	.0000006
A BbDDee--	-----	.0001183	.0000355	.0000050	-----	.0000848	.0000228	.0000030	-----	.0000269	.0000057	.0000006
A BbDDEE--	-----	.0001183	.0000355	.0000050	-----	.0000848	.0000228	.0000030	-----	.0000269	.0000057	.0000006
A BbDDEE--	-----	.0001183	.0000355	.0000050	-----	.0000848	.0000228	.0000030	-----	.0000269	.0000057	.0000006
A bbdDEE--	-----	.0001183	.0000355	.0000050	-----	.0000848	.0000228	.0000030	-----	.0000269	.0000057	.0000006
A bbdDEE--	-----	.0001183	.0000355	.0000050	-----	.0000848	.0000228	.0000030	-----	.0000269	.0000057	.0000006
a BBDDEE--	-----	.0001183	.0000057	.0000002	-----	.0000763	.0000032	.0000001	-----	.0000188	.0000005	.0000000
A BbDDee--.0800000	.0105917	.0011436	.0001101	.0694444	.0079346	.0007837	.0000709	.0413223	.0032196	.0002544	.0000197	
a BBDDee--	-----	.0001775	.0000193	.0000012	-----	.0001187	.0000115	.0000007	-----	.0000322	.0000024	.0000001
a BBDDEE--	-----	.0001775	.0000193	.0000012	-----	.0001187	.0000115	.0000007	-----	.0000322	.0000024	.0000001
a BbDDEE--	-----	.0001775	.0000193	.0000012	-----	.0001187	.0000115	.0000007	-----	.0000322	.0000024	.0000001
A BbDDee--	-----	.0000592	.0000361	.0000102	-----	.0000424	.0000246	.0000066	-----	.0000134	.0000070	.0000017
A bbdDEE--	-----	.0000592	.0000361	.0000102	-----	.0000424	.0000246	.0000066	-----	.0000134	.0000070	.0000017
A bbdDEE--	-----	.0000592	.0000361	.0000102	-----	.0000424	.0000246	.0000066	-----	.0000134	.0000070	.0000017
A BbDDee--	-----	.0035503	.0012517	.0002725	-----	.0030518	.0009578	.0001952	-----	.0017737	.0004201	.0000729
A BbDDee--	-----	.0035503	.0012517	.0002725	-----	.0030518	.0009578	.0001952	-----	.0017737	.0004201	.0000729
A bbdDEE--	-----	.0035503	.0012517	.0002725	-----	.0030518	.0009578	.0001952	-----	.0017737	.0004201	.0000729
a BBDDee--	-----	.0000592	.0000161	.0000022	-----	.0000424	.0000105	.0000013	-----	.0000134	.0000027	.0000003
a BbDDEE--	-----	.0000592	.0000161	.0000022	-----	.0000424	.0000105	.0000013	-----	.0000134	.0000027	.0000003
a bbdDEE--	-----	.0000592	.0000161	.0000022	-----	.0000424	.0000105	.0000013	-----	.0000134	.0000027	.0000003
a BBDDee--	-----	.0002959	.0000776	.0000103	-----	.0002035	.0000492	.0000061	-----	.0000591	.0000118	.0000013
a BbDDEE--	-----	.0002959	.0000776	.0000103	-----	.0002035	.0000492	.0000061	-----	.0000591	.0000118	.0000013
a bbdDEE--	-----	.0002959	.0000776	.0000103	-----	.0002035	.0000492	.0000061	-----	.0000591	.0000118	.0000013
A BbDDee--	-----	.0034320	.0022060	.0009414	-----	.0029670	.0018160	.0007391	-----	.0017468	.0009584	.0003495
A BbDDee--	-----	.0034320	.0022060	.0009414	-----	.0029670	.0018160	.0007391	-----	.0017468	.0009584	.0003495
A bbdDEE--	-----	.0034320	.0022060	.0009414	-----	.0029670	.0018160	.0007391	-----	.0017468	.0009584	.0003495
a BBDDee--	-----	.0001183	.0000755	.0000210	-----	.0000848	.0000512	.0000135	-----	.0000269	.0000144	.0000034
a BbDDEE--	-----	.0001183	.0000755	.0000210	-----	.0000848	.0000512	.0000135	-----	.0000269	.0000144	.0000034
a BbDDee--	-----	.0001183	.0000755	.0000210	-----	.0000848	.0000512	.0000135	-----	.0000269	.0000144	.0000034
a BbDDEE--	-----	.0001183	.0000755	.0000210	-----	.0000848	.0000512	.0000135	-----	.0000269	.0000144	.0000034
a bbdDEE--	-----	.0001183	.0000755	.0000210	-----	.0000848	.0000512	.0000135	-----	.0000269	.0000144	.0000034
a bbdDEE--	-----	.0001183	.0000755	.0000210	-----	.0000848	.0000512	.0000135	-----	.0000269	.0000144	.0000034
a BbDDee--.0800000	.0171006	.0034913	.0006344	.0694444	.0136312	.0026006	.0004491	.0413223	.0066488	.0010709	.0001630	
a BbDDee--	-----	.0000592	.0000885	.0000500	-----	.0000424	.0000625	.0000342	-----	.0000134	.0000193	.0000098
a bbdDEE--	-----	.0000592	.0000885	.0000500	-----	.0000424	.0000625	.0000342	-----	.0000134	.0000193	.0000098
a bbdDEE--	-----	.0000592	.0000885	.0000500	-----	.0000424	.0000625	.0000342	-----	.0000134	.0000193	.0000098
A bbdDee--	-----	.0033728	.0051970	.0043725	-----	.0029246	.0044527	.0036610	-----	.0017334	.0025741	.0020145
a BbDDee--	-----	.0101775	.0055125	.0021133	-----	.0088162	.0044873	.0016464	-----	.0052137	.0023081	.0007653
a BbDDEE--	-----	.0101775	.0055125	.0021133	-----	.0088162	.0044873	.0016464	-----	.0052137	.0023081	.0007653
a bbdDEE--	-----	.0101775	.0055125	.0021133	-----	.0088162	.0044873	.0016464	-----	.0052137	.0023081	.0007653
a BbDDee--	-----	.0100592	.0124229	.0095862	-----	.0087314	.0105963	.0079926	-----	.0051868	.0060680	.0043588
a bbdDEE--	-----	.0100592	.0124229	.0095862	-----	.0087314	.0105963	.0079926	-----	.0051868	.0060680	.0043588
a bbdDEE--	-----	.0100592	.0124229	.0095862	-----	.0087314	.0105963	.0079926	-----	.0051868	.0060680	.0043588
a bbdDee--.3200000	.3811238	.4243955	.4557521	.3472222	.4006701	.4375470	.4638448	.4132231	.4454857	.4665629	.4810991	

Table 40.--Relative frequencies of female genotypes when native population (3 autosomal genes BBDDEE plus 1 sex-linked gene AA; female is heterogametic) is overflooded by $\bar{X}$ release insects (aabbdd $\bar{e}\bar{e}$, a-bbdd $\bar{e}\bar{e}$) for every native insect--
Continued

Genotype	$\bar{X} = 20$				$\bar{X} = 50$				$\bar{X} = 100$			
	F ₁	F ₂	F ₃	F ₄	F ₁	F ₂	F ₃	F ₄	F ₁	F ₂	F ₃	F ₄
A BBDDEE--	.0011338	0.000064	0.000000	.0000000	0.001922	0.000008	0.000000	0.000000	0.0000490	0.000002	0.000000	0.000000
A BBDDEe--	-----	.0000099	.0000002	.0000000	-----	.0000015	.0000000	.0000000	-----	.0000004	.0000000	.0000000
A BbDDEE--	-----	.0000099	.0000002	.0000000	-----	.0000015	.0000000	.0000000	-----	.0000004	.0000000	.0000000
A BbDDEe--	-----	.0000099	.0000002	.0000000	-----	.0000015	.0000000	.0000000	-----	.0000004	.0000000	.0000000
A BBDDee--	-----	.0000038	.0000003	.0000000	-----	.0000007	.0000000	.0000000	-----	.0000002	.0000000	.0000000
A BbDDEe--	-----	.0000038	.0000003	.0000000	-----	.0000007	.0000000	.0000000	-----	.0000002	.0000000	.0000000
A bBDDEE--	-----	.0000038	.0000003	.0000000	-----	.0000007	.0000000	.0000000	-----	.0000002	.0000000	.0000000
A BbDDee--	-----	.0000175	.0000011	.0000000	-----	.0000028	.0000002	.0000000	-----	.0000007	.0000000	.0000000
A BbDDEe--	-----	.0000175	.0000011	.0000000	-----	.0000028	.0000002	.0000000	-----	.0000007	.0000000	.0000000
A BbDDEe--	-----	.0000175	.0000011	.0000000	-----	.0000028	.0000002	.0000000	-----	.0000007	.0000000	.0000000
A BBDdEE--	-----	.0000076	.0000014	.0000001	-----	.0000013	.0000002	.0000000	-----	.0000003	.0000001	.0000000
A BbDdEE--	-----	.0000076	.0000014	.0000001	-----	.0000013	.0000002	.0000000	-----	.0000003	.0000001	.0000000
A BbDDee--	-----	.0000076	.0000014	.0000001	-----	.0000013	.0000002	.0000000	-----	.0000003	.0000001	.0000000
A BbDDEe--	-----	.0000076	.0000014	.0000001	-----	.0000013	.0000002	.0000000	-----	.0000003	.0000001	.0000000
A bBDDEe--	-----	.0000076	.0000014	.0000001	-----	.0000013	.0000002	.0000000	-----	.0000003	.0000001	.0000000
A bBDDEe--	-----	.0000076	.0000014	.0000001	-----	.0000013	.0000002	.0000000	-----	.0000003	.0000001	.0000000
a BBDDEE--	-----	.0000046	.0000001	.0000000	-----	.0000007	.0000000	.0000000	-----	.0000002	.0000000	.0000000
A BbDdEe--	.0226757	.0013552	.0000917	.0000064	.0096117	.0004700	.0000281	.0000018	.0049015	.0002219	.0000126	.0000008
a BBDDEe--	-----	.0000084	.0000005	.0000000	-----	.0000014	.0000001	.0000000	-----	.0000003	.0000000	.0000000
a BbDDEE--	-----	.0000084	.0000005	.0000000	-----	.0000014	.0000001	.0000000	-----	.0000003	.0000000	.0000000
a BbDDEe--	-----	.0000084	.0000005	.0000000	-----	.0000014	.0000001	.0000000	-----	.0000003	.0000000	.0000000
A BbDdee--	-----	.0000038	.0000019	.0000004	-----	.0000007	.0000003	.0000001	-----	.0000002	.0000001	.0000000
A bBDDee--	-----	.0000038	.0000019	.0000004	-----	.0000007	.0000003	.0000001	-----	.0000002	.0000001	.0000000
A bBDDEe--	-----	.0000038	.0000019	.0000004	-----	.0000007	.0000003	.0000001	-----	.0000002	.0000001	.0000000
A BbDdee--	-----	.0009598	.0001906	.0000298	-----	.0004031	.0000709	.0000102	-----	.0002049	.0000345	.0000048
A BbDDee--	-----	.0009598	.0001906	.0000298	-----	.0004031	.0000709	.0000102	-----	.0002049	.0000345	.0000048
A bBDDee--	-----	.0009598	.0001906	.0000298	-----	.0004031	.0000709	.0000102	-----	.0002049	.0000345	.0000048
a BBDDee--	-----	.0000038	.0000007	.0000001	-----	.0000007	.0000001	.0000000	-----	.0000002	.0000000	.0000000
a BbDDEe--	-----	.0000038	.0000007	.0000001	-----	.0000007	.0000001	.0000000	-----	.0000002	.0000000	.0000000
a bBDDEe--	-----	.0000038	.0000007	.0000001	-----	.0000007	.0000001	.0000000	-----	.0000002	.0000000	.0000000
a BBDDee--	-----	.0000160	.0000028	.0000003	-----	.0000027	.0000004	.0000000	-----	.0000007	.0000001	.0000000
a BbDDEe--	-----	.0000160	.0000028	.0000003	-----	.0000027	.0000004	.0000000	-----	.0000007	.0000001	.0000000
a BbDDEe--	-----	.0000160	.0000028	.0000003	-----	.0000027	.0000004	.0000000	-----	.0000007	.0000001	.0000000
A BbDdee--	-----	.0009522	.0004912	.0001679	-----	.0004018	.0001992	.0000652	-----	.0002046	.0001000	.0000323
A BbDDee--	-----	.0009522	.0004912	.0001679	-----	.0004018	.0001992	.0000652	-----	.0002046	.0001000	.0000323
A bBDDee--	-----	.0009522	.0004912	.0001679	-----	.0004018	.0001992	.0000652	-----	.0002046	.0001000	.0000323
a BBDdee--	-----	.0000076	.0000038	.0000008	-----	.0000013	.0000006	.0000001	-----	.0000003	.0000002	.0000000
a BbDDEe--	-----	.0000076	.0000038	.0000008	-----	.0000013	.0000006	.0000001	-----	.0000003	.0000002	.0000000
a BbDDee--	-----	.0000076	.0000038	.0000008	-----	.0000013	.0000006	.0000001	-----	.0000003	.0000002	.0000000
a BbDDEe--	-----	.0000076	.0000038	.0000008	-----	.0000013	.0000006	.0000001	-----	.0000003	.0000002	.0000000
a bBDDEe--	-----	.0000076	.0000038	.0000008	-----	.0000013	.0000006	.0000001	-----	.0000003	.0000002	.0000000
a bBDDee--	-----	.0000076	.0000038	.0000008	-----	.0000013	.0000006	.0000001	-----	.0000003	.0000002	.0000000
a BbDdEe--	.0226757	.0032428	.0004673	.0000654	.0096117	.0012708	.0001689	.0000222	.0049015	.0006304	.0000813	.0000104
a BbDdee--	-----	.0000038	.0000005	.0000002	-----	.0000007	.0000009	.0000004	-----	.0000002	.0000002	.0000001
a bBDDee--	-----	.0000038	.0000005	.0000002	-----	.0000007	.0000009	.0000004	-----	.0000002	.0000002	.0000001
a bBDDee--	-----	.0000038	.0000005	.0000002	-----	.0000007	.0000009	.0000004	-----	.0000002	.0000002	.0000001
A bBDdee--	-----	.0009484	.0013902	.0010594	-----	.0004011	.0005833	.0004372	-----	.0002044	.0002964	.0002209
a BbDdee--	-----	.0028489	.0011653	.0003639	-----	.0012040	.0004680	.0001404	-----	.0006134	.0002342	.0000693
a BbDDee--	-----	.0028489	.0011653	.0003639	-----	.0012040	.0004680	.0001404	-----	.0006134	.0002342	.0000693
a bBDDee--	-----	.0028489	.0011653	.0003639	-----	.0012040	.0004680	.0001404	-----	.0006134	.0002342	.0000693
a BbDdee--	-----	.0028413	.0032607	.0022814	-----	.0012027	.0013640	.0009388	-----	.0006130	.0006924	.0004739
a bBDDee--	-----	.0028413	.0032607	.0022814	-----	.0012027	.0013640	.0009388	-----	.0006130	.0006924	.0004739
a bBDDee--	-----	.0028413	.0032607	.0022814	-----	.0012027	.0013640	.0009388	-----	.0006130	.0006924	.0004739
a bBDdee--	.4535145	.4713434	.4826567	.4903225	.4305842	.4881729	.4929017	.4960715	.4901480	.4940229	.4964218	.4980256

Table 40.--Relative frequencies of female genotypes when native population (3 autosomal genes BEDDEE plus 1 sex-linked gene AA; female is heterogametic) is overflooded by $\bar{X}$ release insects (aabbdee, a-bbdee) for every native insect--
Continued

Genotype	$\bar{X} = 200$				$\bar{X} = 500$				$\bar{X} = 1,000$			
	F ₁	F ₂	F ₃	F ₄	F ₁	F ₂	F ₃	F ₄	F ₁	F ₂	F ₃	F ₄
A BEDDEE--	0.0000124	0.0000000	0.0000000	0.0000000	0.0000020	0.0000000	0.0000000	0.0000000	0.0000005	0.0000000	0.0000000	0.0000000
A BBDDEe--	-----	.0000000	.0000000	.0000000	-----	.0000000	.0000000	.0000000	-----	.0000000	.0000000	.0000000
A BbDDEe--	-----	.0000000	.0000000	.0000000	-----	.0000000	.0000000	.0000000	-----	.0000000	.0000000	.0000000
A BbdDEe--	-----	.0000000	.0000000	.0000000	-----	.0000000	.0000000	.0000000	-----	.0000000	.0000000	.0000000
A BBDDee--	-----	.0000000	.0000000	.0000000	-----	.0000000	.0000000	.0000000	-----	.0000000	.0000000	.0000000
A BbDDee--	-----	.0000000	.0000000	.0000000	-----	.0000000	.0000000	.0000000	-----	.0000000	.0000000	.0000000
A bbdDEe--	-----	.0000000	.0000000	.0000000	-----	.0000000	.0000000	.0000000	-----	.0000000	.0000000	.0000000
A BBDdeE--	-----	.0000002	.0000000	.0000000	-----	.0000000	.0000000	.0000000	-----	.0000000	.0000000	.0000000
A BbDdeE--	-----	.0000002	.0000000	.0000000	-----	.0000000	.0000000	.0000000	-----	.0000000	.0000000	.0000000
A BbddeE--	-----	.0000002	.0000000	.0000000	-----	.0000000	.0000000	.0000000	-----	.0000000	.0000000	.0000000
A BBDDEe--	-----	.0000001	.0000000	.0000000	-----	.0000000	.0000000	.0000000	-----	.0000000	.0000000	.0000000
A BbDDEe--	-----	.0000001	.0000000	.0000000	-----	.0000000	.0000000	.0000000	-----	.0000000	.0000000	.0000000
A BbdDEe--	-----	.0000001	.0000000	.0000000	-----	.0000000	.0000000	.0000000	-----	.0000000	.0000000	.0000000
A BbDdeE--	-----	.0000001	.0000000	.0000000	-----	.0000000	.0000000	.0000000	-----	.0000000	.0000000	.0000000
A bbdDeE--	-----	.0000001	.0000000	.0000000	-----	.0000000	.0000000	.0000000	-----	.0000000	.0000000	.0000000
A bbddeE--	-----	.0000001	.0000000	.0000000	-----	.0000000	.0000000	.0000000	-----	.0000000	.0000000	.0000000
a BEDDEE--	-----	.0000000	.0000000	.0000000	-----	.0000000	.0000000	.0000000	-----	.0000000	.0000000	.0000000
A BbDdeE--	.0024752	.0001076	.0000059	.0000003	.0009960	.0000422	.0000023	.0000001	.0004990	.0000210	.0000011	.0000000
a BBDDee--	-----	.0000001	.0000000	.0000000	-----	.0000000	.0000000	.0000000	-----	.0000000	.0000000	.0000000
a BbDDee--	-----	.0000001	.0000000	.0000000	-----	.0000000	.0000000	.0000000	-----	.0000000	.0000000	.0000000
a BbdDEe--	-----	.0000001	.0000000	.0000000	-----	.0000000	.0000000	.0000000	-----	.0000000	.0000000	.0000000
A BbDdeE--	-----	.0000000	.0000000	.0000000	-----	.0000000	.0000000	.0000000	-----	.0000000	.0000000	.0000000
A bbdDeE--	-----	.0000000	.0000000	.0000000	-----	.0000000	.0000000	.0000000	-----	.0000000	.0000000	.0000000
A bbddeE--	-----	.0000000	.0000000	.0000000	-----	.0000000	.0000000	.0000000	-----	.0000000	.0000000	.0000000
A BbDdeE--	-----	.0001033	.0000170	.0000023	-----	.0000415	.0000067	.0000009	-----	.0000308	.0000034	.0000005
A BbDDEe--	-----	.0001033	.0000170	.0000023	-----	.0000415	.0000067	.0000009	-----	.0000308	.0000034	.0000005
A bbdDeE--	-----	.0001033	.0000170	.0000023	-----	.0000415	.0000067	.0000009	-----	.0000308	.0000034	.0000005
a BBDDee--	-----	.0000000	.0000000	.0000000	-----	.0000000	.0000000	.0000000	-----	.0000000	.0000000	.0000000
a BbDDee--	-----	.0000000	.0000000	.0000000	-----	.0000000	.0000000	.0000000	-----	.0000000	.0000000	.0000000
a BbdDEe--	-----	.0000000	.0000000	.0000000	-----	.0000000	.0000000	.0000000	-----	.0000000	.0000000	.0000000
a BBDDee--	-----	.0000002	.0000000	.0000000	-----	.0000000	.0000000	.0000000	-----	.0000000	.0000000	.0000000
a BbDDee--	-----	.0000002	.0000000	.0000000	-----	.0000000	.0000000	.0000000	-----	.0000000	.0000000	.0000000
a BbdDEe--	-----	.0000002	.0000000	.0000000	-----	.0000000	.0000000	.0000000	-----	.0000000	.0000000	.0000000
A Bbddee--	-----	.0001032	.0000501	.0000160	-----	.0000415	.0000201	.0000064	-----	.0000208	.0000100	.0000032
A bbdDee--	-----	.0001032	.0000501	.0000160	-----	.0000415	.0000201	.0000064	-----	.0000208	.0000100	.0000032
A bbddeE--	-----	.0001032	.0000501	.0000160	-----	.0000415	.0000201	.0000064	-----	.0000208	.0000100	.0000032
a BBDdeE--	-----	.0000001	.0000000	.0000000	-----	.0000000	.0000000	.0000000	-----	.0000000	.0000000	.0000000
a BbDdeE--	-----	.0000001	.0000000	.0000000	-----	.0000000	.0000000	.0000000	-----	.0000000	.0000000	.0000000
a BbDDEe--	-----	.0000001	.0000000	.0000000	-----	.0000000	.0000000	.0000000	-----	.0000000	.0000000	.0000000
a BbdDEE--	-----	.0000001	.0000000	.0000000	-----	.0000000	.0000000	.0000000	-----	.0000000	.0000000	.0000000
a bbdDEe--	-----	.0000001	.0000000	.0000000	-----	.0000000	.0000000	.0000000	-----	.0000000	.0000000	.0000000
a BbdDeE--	.0024752	.0003139	.0000399	.0000050	.0009960	.0001252	.0000158	.0000020	.0004990	.0000626	.0000078	.0000010
a BBDdee--	-----	.0000000	.0000000	.0000000	-----	.0000000	.0000000	.0000000	-----	.0000000	.0000000	.0000000
a BbDDee--	-----	.0000000	.0000000	.0000000	-----	.0000000	.0000000	.0000000	-----	.0000000	.0000000	.0000000
a bbdDEE--	-----	.0000000	.0000000	.0000000	-----	.0000000	.0000000	.0000000	-----	.0000000	.0000000	.0000000
A bbddee--	-----	.0001032	.0001494	.0001111	-----	.0000415	.0000601	.0000446	-----	.0000208	.0000301	.0000223
a BbDdeE--	-----	.0003096	.0001171	.0000344	-----	.0001245	.0000469	.0000137	-----	.0000624	.0000234	.0000068
a BbdDeE--	-----	.0003096	.0001171	.0000344	-----	.0001245	.0000469	.0000137	-----	.0000624	.0000234	.0000068
a bbdDeE--	-----	.0003096	.0001171	.0000344	-----	.0001245	.0000469	.0000137	-----	.0000624	.0000234	.0000068
a Bbddee--	-----	.0003095	.0003489	.0002381	-----	.0001245	.0001402	.0000955	-----	.0000624	.0000702	.0000478
a bbdDee--	-----	.0003095	.0003489	.0002381	-----	.0001245	.0001402	.0000955	-----	.0000624	.0000702	.0000478
a bbddeE--	-----	.0003095	.0003489	.0002381	-----	.0001245	.0001402	.0000955	-----	.0000624	.0000702	.0000478
a bbddee--	.4950372	.4969961	.4982044	.4990106	.4980059	.4987939	.4992795	.4996032	.4990014	.4993959	.4996395	.4998014

Table 1.-Suppression of native population (10,000 insects, 1:1 sex ratio) by overflooding generations with release strain bearing conditional lethal traits when population is held static by conventional means

Case	Genotypes of--		Inheritance of conditional lethal traits in release strain			Release ratio ^{1/}	Sex	Number of viable genotypes in--			
	Native strain	Release strain	Trait 1	Trait 2	Trait 3			F ₁	F ₂	F ₃	F ₄
Overflooded in parental generation											
1a----	aa	AA	1 dom.auto.	-----	-----	50	-	4	4	4	4
1b----	aa	AA	1 dom.auto.	-----	-----	100	-	1	1	1	1
2a----	AABB	aabb	2 auto.(3,4)	-----	-----	50	-	4	5	3	2
2b----	AABB	aabb	2 auto.(3,4)	-----	-----	100	-	1	1	1	1
3-----	AABB	aabb	2 auto.(2-4)	-----	-----	1,000	-	20	10	5	3
-----	AABDD	aabdd	3 auto.(4-6)	-----	-----	100	-	1	1	1	0
5a----	AABBDDEE	aabbddee	4 auto.(6-8)	-----	-----	20	-	23	12	3	1
5b----	AABBDDEE	aabbddee	4 auto.(6-8)	-----	-----	50	-	4	2	0	0
6a----	AABBDDEE	aabbddee	3 auto.+ 1 s.l.(6-9)	-----	-----	50	M	194	31	7	2
6a----	AABBDDEE	aabbddee	3 auto.+ 1 s.l.(6-9)	-----	-----	50	F	98	16	3	1
6b----	AABBDDEE	aabbddee	3 auto.+ 1 s.l.(6-9)	-----	-----	200	M	50	8	1	0
6b----	AABBDDEE	aabbddee	3 auto.+ 1 s.l.(6-9)	-----	-----	200	F	25	3	1	0
7-----	aabb	AABB	1 dom.auto.	1 dom.auto.	-----	50	-	4	1	0	0
7-----	aabDD	Aabdd	1 dom.auto.	2 auto.(3,4)	-----	50	-	4	1	0	0
9a----	aabBDDEE	Aabbddee	1 dom.auto.	3 auto.(4-6)	-----	20	-	23	9	2	0
9b----	aabBDDEE	Aabbddee	1 dom.auto.	3 auto.(4-6)	-----	50	-	4	1	0	0
10a----	aabBDDEE	Aabbddee	2 auto.(3,4)	2 auto.(3,4)	-----	20	-	23	10	2	0
10b----	aabBDDEE	Aabbddee	2 auto.(3,4)	2 auto.(3,4)	-----	50	-	4	1	0	0
11a----	aabBDDEE	Aabbddee	1 dom.s.l.	3 auto.(4-6)	-----	10	M	41	29	8	2
11a----	aabBDDEE	Aabbddee	1 dom.s.l.	3 auto.(4-6)	-----	10	F	41	33	15	5
11b----	aabBDDEE	Aabbddee	1 dom.s.l.	3 auto.(4-6)	-----	50	M	2	1	0	0
11b----	aabBDDEE	Aabbddee	1 dom.s.l.	3 auto.(4-6)	-----	50	F	2	1	0	0
12a----	aabddd	AABDD	1 dom.auto.	1 dom.auto.	1 dom.auto.	10	-	83	8	1	D
12b----	aabddd	AABDD	1 dom.auto.	1 dom.auto.	1 dom.auto.	50	-	4	0	0	0
13a----	aabbdDDEE	AABDdee	1 dom.auto.	1 dom.auto.	2 auto.(3,4)	10	-	83	11	1	D
13b----	aabbdDDEE	AABDdee	1 dom.auto.	1 dom.auto.	2 auto.(3,4)	20	-	23	2	D	0
14a----	aabbdDDEE	AABDdee	1 dom.auto.	1 dom.auto.	2 auto.(2-4)	10	-	83	19	4	1
14b----	aabbdDDEE	AABDdee	1 dom.auto.	1 dom.auto.	2 auto.(2-4)	50	-	4	1	0	0
15a----	aabbdDDEE	AABDdee	1 dom.s.l.	1 dom.auto.	2 auto.(3,4)	20	M	11	1	0	0
15a----	aabbdDDEE	AABDdee	1 dom.s.l.	1 dom.auto.	2 auto.(3,4)	20	F	11	2	0	0
15b----	aabbdDDEE	AABDdee	1 dom.s.l.	1 dom.auto.	2 auto.(3,4)	50	M	2	0	0	0
15b----	aabbdDDEE	AABDdee	1 dom.s.l.	1 dom.auto.	2 auto.(3,4)	50	F	2	0	0	0
Overflooded in parental, F ₁ , F ₂ , and F ₃ generations											
16a----	aa	AA	1 dom.auto.	-----	-----	10	-	83	10	2	D
16b----	aa	AA	1 dom.auto.	-----	-----	50	-	4	0	0	0
17a----	AABB	aabb	2 auto.(3,4)	-----	-----	5	-	278	51	8	1
17b----	AABB	aabb	2 auto.(3,4)	-----	-----	50	-	6	1	0	0
18a----	AABB	aabb	2 auto.(2-4)	-----	-----	100	-	197	34	7	2
18b----	AABB	aabb	2 auto.(2-4)	-----	-----	1,000	-	20	3	1	0
19a----	AABDD	aabdd	3 auto.(4-6)	-----	-----	10	-	83	14	2	0
19b----	AABDD	aabdd	3 auto.(4-6)	-----	-----	50	-	4	1	0	0
20a----	AABBDDEE	aabbddee	4 auto.(6-8)	-----	-----	5	-	278	32	2	0
20b----	AABBDDEE	aabbddee	4 auto.(6-8)	-----	-----	20	-	23	2	0	0
21a----	AABBDDEE	aabbddee	3 auto.+ 1 s.l.(6-9)	-----	-----	4	M	1,800	248	26	2
21a----	AABBDDEE	aabbddee	3 auto.+ 1 s.l.(6-9)	-----	-----	4	F	1,000	147	16	2
21b----	AABBDDEE	aabbddee	3 auto.+ 1 s.l.(6-9)	-----	-----	200	M	50	2	0	0
21b----	AABBDDEE	aabbddee	3 auto.+ 1 s.l.(6-9)	-----	-----	200	F	25	1	0	0
22a----	aabb	AABB	1 dom.auto.	1 dom.auto.	-----	3	-	625	39	3	0
22b----	aabb	AABB	1 dom.auto.	1 dom.auto.	-----	10	-	83	3	0	0
23a----	aabDD	Aabdd	1 dom.auto.	2 auto.(3,4)	-----	3	-	625	52	2	1
23b----	aabDD	Aabdd	1 dom.auto.	2 auto.(3,4)	-----	10	-	83	4	2	0
24a----	aabBDDEE	Aabbddee	1 dom.auto.	3 auto.(4-6)	-----	3	-	625	58	3	0
24b----	aabBDDEE	Aabbddee	1 dom.auto.	3 auto.(4-6)	-----	20	-	23	1	0	0
25a----	AABBDDEE	aabbddee	2 auto.(3,4)	2 auto.(3,4)	-----	3	-	625	70	4	1
25b----	AABBDDEE	aabbddee	2 auto.(3,4)	2 auto.(3,4)	-----	20	-	23	1	0	0
26a----	aabBDDEE	Aabbddee	1 dom.s.l.	3 auto.(4-6)	-----	2	M	556	67	5	1
26a----	aabBDDEE	Aabbddee	1 dom.s.l.	3 auto.(4-6)	-----	2	F	556	65	11	1
26b----	aabBDDEE	Aabbddee	1 dom.s.l.	3 auto.(4-6)	-----	20	M	11	1	0	0
26b----	aabBDDEE	Aabbddee	1 dom.s.l.	3 auto.(4-6)	-----	20	F	11	1	0	0
27a----	aabddd	AABDD	1 dom.auto.	1 dom.auto.	1 dom.auto.	2	-	1,111	51	2	0
27b----	aabddd	AABDD	1 dom.auto.	1 dom.auto.	1 dom.auto.	10	-	83	1	D	0
28a----	aabbdDDEE	AABDdee	1 dom.auto.	1 dom.auto.	2 auto.(3,4)	2	-	1,111	64	2	1
28b----	aabbdDDEE	AABDdee	1 dom.auto.	1 dom.auto.	2 auto.(3,4)	10	-	83	1	0	0
29a----	aabbdDDEE	AABDdee	1 dom.auto.	1 dom.auto.	2 auto.(2-4)	3	-	625	35	2	1
29b----	aabbdDDEE	AABDdee	1 dom.auto.	1 dom.auto.	2 auto.(2-4)	20	-	23	1	0	0
30a----	aabBDDEE	AABDdee	1 dom.s.l.	1 dom.auto.	2 auto.(3,4)	1	M	1,250	143	9	0
30a----	aabBDDEE	AABDdee	1 dom.s.l.	1 dom.auto.	2 auto.(3,4)	1	F	1,250	178	16	1
30b----	aabBDDEE	AABDdee	1 dom.s.l.	1 dom.auto.	2 auto.(3,4)	10	M	41	1	0	0
30b----	aabBDDEE	AABDdee	1 dom.s.l.	1 dom.auto.	2 auto.(3,4)	10	F	41	1	0	0

^{1/}

Number of release insects for every native insect.