TERMINOLOGY OF CARRIERS FOR GRANULATED INSECTICIDES

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Granulated insecticides are in the pioneer stage—developed far enough to offer specific challenges but not quite far enough to be bewildering. At this time it is appropriate to consider some of the terminology involved, in an attempt to keep this new field free of certain errors to which we have become accustomed. A granulated insecticide is one in which the active ingredient is incorporated with an inert carrier to give a dry granular product free of objectionable dustiness. At least 98 percent of this product should pass a U. S. No. 18 (1,000 micron) sieve and not more than 10 percent a U. S. No. 100 (149 micron) sieve. Much of the ensuing discussion is equally applicable to wettable and dusting powders.

"CARRIER" AND SIMILAR TERMS. The choice of terms to designate the inert ingredients of a formulation is often a matter of personal or group habit. Such expressions as "inert ingredients," "total inerts," and "inactive ingredients," are convenient for designating those with negligible biological activity. This language is suitable for establishing the concentration of the active ingredients, but gives no information as to origin, purpose, or function of the inert ingredients.

"Diluent" is likewise indefinite although it does imply the deliberate addition of the inactive component. The purpose of the addition is left in doubt. It may be simply convenience of handling, though there may be a hint that the object is an economic one—that is, to extend or cheapen the product. The term "filler" is in a similar category.

"Carrier" and "conditioner" have more specific meaning. They indicate a technical function of the inert material—a mechanical activity or use in spite of the chemical or biological inactivity. A carrier is a vehicle, a means of conveying the active ingredient to its place of action, and a conditioner is an agent for effecting a desirable condition, form, or physical quality in the finished product. The distinction between a carrier and a conditioner is not always sharp. The difference in function is often reflected in the percentage composition. For example, in a 50:50 blend of clay with a waxy insecticide such as DDT, the clay may be regarded as both a conditioner and a carrier, whereas in a 90 percent DDT powder with a finely divided silica as the remaining 10 percent, the function of the silica is obviously to condition the DDT, or improve its physical quality.

KINDS OF CARRIERS. In designating kinds of carriers, especially in comparative reports, it is important to distinguish between species, varieties, and grades of minerals, and, above all, to distinguish between mineralogical names and brand names.

In making comparisons it is preferable to avoid brand names. There are at least two reasons for this. First, there is the obvious consideration of business ethics. Second, there is the false sense of definiteness one may get from the use of a brand name. Usually the producers of a line of mineral carriers maintain concurrently two or more grades of the same species.

Loose tendencies are found in names and designations of minerals. Talc occurs in several forms—laminar, fibrous, granular, and modifications of these forms. Because of impurities it varies in color from white to green, and occasionally other colors are present. Its specific gravity may range from 2.7 to 3.0—the theoretical value (Gruner 1934) is 2.8. Catalysts for the decomposition of DDT are sometimes present as impurities, and sometimes not (Fleck and Haller 1945). And although

talc is a hardness-reference mineral (Mohs scale) with the nominal value of 1, its practical rating is 1–1.5 (Dana 1932). The quartz content varies from practically nothing to a conspicuous amount. Yet to many of us talc is talc. Rock species with long or cumbersome names, on the other hand, are commonly known by catchy brand names.

Among the mineral names that are inadequate characterizations in themselves are "fuller's earth" and "bentonite." These two products are prominent in connection with granulated insecticides. Some fuller's earths are essentially montmorillonite; others are mainly attapulgite. The total number of species that exist as components of fuller's earth is estimated to be in the dozens (Ries 1927). Some fuller's earths on the market have six or eight times the surface mean diameter of others. Differently processed products from the same company differ significantly in sorptive capacity and in breakdown of granules under the action of water. Bentonite is composed largely of montmorillonite, but many other components and impurities may be present, and products from different sources vary in exchangeable bases, pH value, and capacity for swelling in water.

Botanical carriers, such as rice hulls, are used occasionally in granulated insecticides, but their characterization offers no serious problem.

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ECOLOGICAL DATA ESSENTIAL TO EFFECTIVE AND ECONOMICAL CONTROL OF LITTORAL MOSQUITOES AND NUISANCE FLIES

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The biological gradient prevalent on the marshes scattered along the Massachusetts coastline constitutes an intriguing phenomenon. Although variations in the general appearance of individual marshes are rather obvious, the orderly distribution of aquatic organisms inhabiting these areas is somewhat obscure. Probably the most striking characteristic is the predominating floral species associated with each type of marsh. Since the distribution of both flora and fauna depend to a considerable degree upon marsh elevation, salinity, and moisture content, these dominant floral species might serve as floral labels for the various marsh types and indicate, also, the presence of the less conspicuous organisms common to their respective areas. Past experience has emphasized the value of some system, such as floral labels, which would furnish ready information relative to the ecological conditions and the probable fauna existing in areas where control treatments are contemplated. Although marsh classification, based on the presence of dominant floral species, appears fundamentally sound some adjustments should be anticipated when the suggested method is applied in a different biological or geological zone.

A brief basic conception of the geo-