Krilium

THE new soil conditioner Krilium has received a great deal of publicity since a preliminary announcement was made at the Philadelphia meeting of the AAAS last December. It is a soil conditioner and not a fertilizer. No claims are made for fertilizer value of the material, but the improvement of physical conditions resulting from its use may cause the plant nutrients of soils, as well as those of fertilizers, to become more useful to growing plants.

Krilium is a pale-yellow powder that can transform tight, gummy clays into friable materials of crumb-like structure. Even though it must dissolve in the soil moisture to promote physical improvement, Krilium does not move or leach below the zone of application; hence its effectiveness in the plow-depth may be somewhat limited by impervious subsoil conditions.

Chemically this material is a sodium salt of a hydrolyzed polyacrylonitrile. It is a long-chain, organic molecule, somewhat similar in structure to the nylon molecule and it is nontoxic at the rates of application used. It improves soil structure by aggregating and loosely cementing clay particles together in much the same way that decomposing organic matter acts. Yet the new compound decomposes in the soil very slowly, at a rate not yet determined.

Krilium is one of a family of chemicals developed by the Monsanto Chemical Company at Dayton, Ohio. It is not yet available commercially but is expected to be on the market some time in 1953. The Department of Agriculture and several state agricultural experiment stations have been interested in the agricultural possibilities of this material since it was first brought to their attention. During the 1951 growing season, preliminary experiments were conducted by the USDA on saline and alkali soils in California, to find out if Krilium or closely related compounds might aid in their reclamation or in the production of more nearly normal crop yields. Favorable results were obtained, with remarkable increases in germination and stands of corn. In one case, yield increase was as much as fivefold. Other experiments at our field stations in Alabama, Tennessee, Pennsylvania, and Wisconsin are not yet fully evaluated, but the material has been shown to produce definite improvement in the physical character of heavy clay soils. Better aeration, which is necessary for normal root development, is one of the beneficial effects.

Best results are obtained when Krilium is applied to a soil previously prepared for seeding. The dry powder should be spread uniformly, and mixed immediately and thoroughly to the desired depth. Rates of application range from 400 to 2000 pounds per acre when incorporated in soil to a six-inch depth. Unfortunately, the possibilities of widespread agricultural use do not seem large at present in view of proposed high introductory prices.

There are, however, a number of specialized agricultural uses for which the material should be practical—for example, preparation of potting soils, greenhouse production of flowers and vegetables, home flower and vegetable gardens located on heavy soil, and possibly certain market garden areas where high-value specialty crops are grown. For garden plots Krilium should be mixed thoroughly to spade depth, using a rate of about 0.1 per cent, or 1 pound to 20 square feet. In the case of potting soil, 1 ounce should suffice for 100–150 pounds of soil. Another field of utilization includes the stabilization of soil in road cuts and similar engineering projects, where an application of 1 pound per 100 square feet applied on the surface serves to hold the soil while turf is being established from seed. Additional research is planned by this Bureau and by state agricultural experiment stations. One of the items receiving attention in this Bureau is the treatment of a narrow band of soil above or around the seed or a shallow over-all treatment for the purpose of improving emergence.

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