What is *Krilium?*

University Tests Soil Conditioner

By W. H. Fuller and H. P. Cords

Krilium Treated Soil

Note effect of Krilium on the stand of sour clover. Good Stand obtained.

Untreated Soil

Note that with no treatment of Krilium, no stand of sour clover was obtained.

What is Krilium? To the chemist it is a "hydrolyzed product of polyacrylonitrile." To the man who uses it in field tests it is a white powder that forms an extremely sticky gum when wet. It is very similar in physical properties to polyuronides found occurring naturally in abundance in fertile virgin soil, but which are very scarce in extensively cultivated soils of low organic matter content.

This new soil conditioner recently has been introduced to the public by Monsanto Chemical Company as a wonder product for improving poor physical conditions of the soil. The wide national attention given to Krilium in the press has brought a demand for additional information by those associated with agriculture.

Krilium is not a plant food; consequently, it is not classed as a fertilizer. However, its influence in improving the physical condition of the soil may improve the availability of plant nutrients of the soil or of fertilizers.

Tested by University

One of the first replicated field tests with Krilium was conducted by the University of Arizona Agricultural Experiment Station. The tests are continuing through their second year. Data from these experiments show Krilium to have a profound influence on the physical conditions of the soil. For example, an extremely heavy cloddy Pima clay that crusted badly was made loose and more porous by additions of Krilium .(See pictures at right above.)

Most soils may be worked by tillage implements into a good seedbed, but all soils do not retain this loose porous structure upon wetting. Soils of poor soil structure slake and disperse badly, forming a dense mass with a hard crust and large deep cracks upon drying. This condition makes it difficult to get good stands of seedlings. The plants that emerge come through cracks only. Most of the roots and germinating shoots of seedlings are drowned by the puddled unaerated soil or are physically trapped and suffocated by the dense and almost impermeable surface crust.

The Number of Alfalfa and Sour Clover Seedling Emerging in Pima Clay in a 3-foot Row As Influenced By Different Soil Correctives (average of 6 plots)

	ALFALFA		SOUR CLOVER	
Treatments	Before 1st irrigation—17 days	After 1st irrigation—31 days	Before 1st irrigation—17 days	After 1st irrigation—31 days
Krilium	103	113	80	58
Sulfur	53	43	56	14
Gypsum	52	44	63	24
No treatment	60	39	52	32

17 and 31 days refer to time after seeding

Improved Stands

Krilium added to such a soil was shown at the University of Arizona Experimental Farm at Tucson to improve seedling stands of alfalfa by at least two fold and sour clover by only slightly less. (See table above.) Other soil amendments had little influence on seedling emergence in this soil. Perhaps a more suitable concentration of these amendments would have given more favorable results.

Yield data in the figure (page 12) show that Krilium had a remark-

(Please turn to page 12)

The feeding of the experimental chicks is carefully controlled.

Alfalfa Growth Factors For Chicks are Checked

By A. R. Kemmerer

During the last few years, considerable effort has been expended by nutritionists and biochemists to determine unidentified factors in feeds necessary, or at least beneficial, for chickens. Notable achievements have been the discovery of vitamin B_{12} and other factors in animal proteins that are beneficial for chickens. These substances are now incorporated in many commercial poultry feeds. Sardine meal and dried skim milk are examples of good sources.

Very little work has been done on the possible existence of factors, not yet identified, in plant materials that exert a beneficial effect for chicks. With financial aid from the American Dehydrators Association, the Department of Nutrition has found that alfalfa meal dehydrated under carefully controlled conditions contains unidentified factors which apparently stimulate the growth of chickens.

The table above gives an example of the data obtained from the experiments. The basal diet in the table contains all the known ingredients necessary for chicks. The addition of dehydrated alfalfa meal to the basal diet caused an increase in the growth rate of the chicks.

Growth Stimulating Effect of Dehydrated Alfalfa Meal

Diet	Increase in Weight in 4 weeks
	gm.
Basal diet	341
Basal diet plus dehydrated alfalfa	398

However, the growth rate of some hatches of chicks was not stimulated by alfalfa. Experimental evidence shows that these chicks were hatched with appreciable amounts of the stimulating factors stored in their bodies.

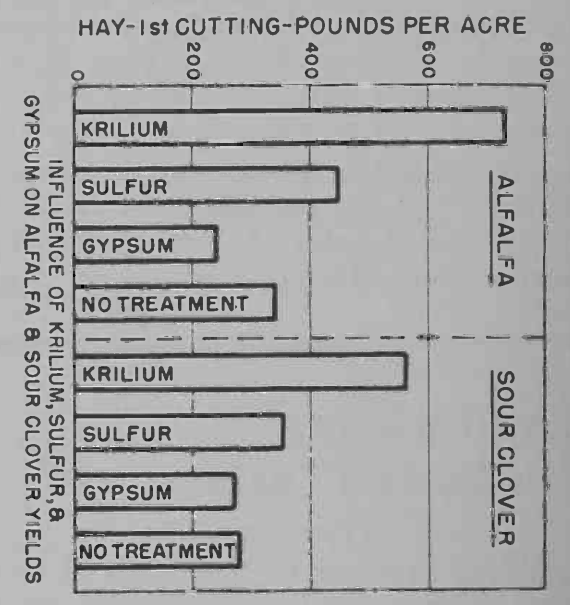
Alfalfa is not the only source of this growth stimulating factor. Brewers yeast when added to the basal diet also produces a growth stimulating effect. This, however, does not detract from the value of alfalfa as a source of the factor. Food factors are usually found in more than one source.

—A. R. Kemmerer is Head of the Department of Nutrition.

What is Krilium?

(*From page 5*)

ably favorable influence on both alfalfa and sour clover hay production.



Soil aggregate formation, a measure of physical condition of the soil, also was much greater in the Pima clay as a result of application of Krilium. Controlled greenhouse investigations showed that the structure of two problem soils, Casa Grande loam and Gila fine sandy loam, could be improved greatly by Krilium. Not only was the surface condition made much more loose and porous, but soil structure at a depth of 27 inches in the steel drums was improved over that of the untreated soil.

Costs About $2 per Pound

Krilium is expected to cost about two dollars a pound when released for commercial use. However, like many new synthetic compounds, the cost of manufacturing should drop to a level that is more compatible with its value in improving crop production. Even so, a considerable reduction will be necessary before Krilium can be economically used on a field scale, since 400 to 2,000 pounds Krilium per acre has been recommended for most effective results.

Krilium has not been released for general farm use, since it still is considered to be in the experimental stage.

—W. H. Fuller is Associate Biochemist; H. P. Cords is Assistant Agronomist.