Agricultural Extension Service ● University of Minnesota

FACT SHEET

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ORGANIC SOIL CONDITIONERS

Each year the Agricultural Extension Service receives numerous inquiries about the cost and value of organic soil conditioners. Although often intended for use as fertilizers, these commercial products have such low nitrogen, phosphate, and potash contents that they do not qualify for labeling or sale as fertilizers under Minnesota state law.

A sample of one such product contained 2 percent nitrogen, 1 percent phosphate, and 2 percent potash. With the present low prices of inorganic fertilizers, the actual comparative value would be about $5 to $5.50 per ton. The retail price was many times this amount. The cost difference between nutrient value and actual retail price must be justified by the value of the organic ingredients in improving the soil physically. For comparison purposes, it should be noted that leaves from corn plants contain about 2 percent nitrogen, 0.4 percent phosphate, and 2 percent potash.

The important role of organic matter in physical soil improvement or maintenance has long been established. Straw or corn stalk residue is usually plowed under for this purpose. This amounts to from 2 to 4 tons per acre of dry matter, depending on the success of the crop growth. Farmers, therefore, often incorporate similar amounts of organic material simply as a by-product, with about the same nutrient value as the soil conditioners. Adding a few hundred pounds of soil conditioners to this residue may have no significant impact on soil improvement at all.

Barnyard manure is another organic material that can be compared with soil conditioners. Cattle manure contains about .5 percent nitrogen, .25 percent phosphate, and .5 percent potash. One ton of dry organic soil conditioner is therefore equal in organic matter to about 4 or 5 tons of barnyard manure, with this amount of manure containing the same amount of nutrients as the soil conditioner sample referred to above.

Nutrient pollution of lakes, streams, and groundwater is causing widespread concern. Ammonia, an example of a commonly used inorganic nitrogen fertilizer, is acted upon by soil organisms which convert it from ammonia to the nitrate form. If the fertilizer application rate is beyond the need for the immediate crop, this mobile nitrate form can be a source of pollution. Organic material, such as corn stalks, straw, manure, and organic soil conditioners, will likewise be acted upon by soil organisms and produce these mobile nitrates. The only advantage these materials have over inorganic forms is their very low analysis, with fewer nutrients that can cause pollution.

Experiments have shown that if equal amounts of plant food are added, organic materials give equal performance to inorganic forms in producing higher yields. Therefore, low-analysis organic soil conditioners must be applied at several tons per acre to equal the usual recommended rate of a few hundred pounds per acre for inorganic fertilizer. When acted upon by soil organisms, these rates for soil conditioners would eventually produce large quantities of mobile nitrates in exactly the same way as any other source. The action of soil organisms is necessary because plants do not effectively absorb the nutrients in the organic form. Once they have been converted to the inorganic form, plants cannot distinguish as to source of nutrient.

Some organic soil conditioners are quite high in analysis. These materials probably have been fortified with inorganic fertilizers such as ammonium nitrate (33-0-0), potassium chloride (0-0-60), potassium sulfate (0-0-50), and triple super phosphate (0-47-0). Such materials then are only partially organic.

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