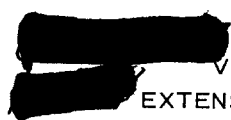
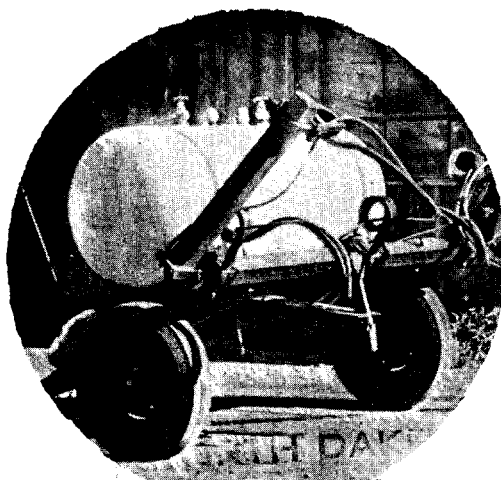




# Liquid Fertilizers

*Their use in  
foliage sprays and  
seed applications*



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**F**armers often ask for information about liquid fertilizers. Sometimes they want to know about specific brands that are recommended for use by the manufacturer as foliar sprays and/or for wetting the seed before planting.

This circular is designed to answer the most common questions about liquid fertilizers made with various nutrient combinations for regular soil application as well as those prepared for special purposes.

#### **LIQUIDS CONTAINING ONLY NITROGEN**

Gaseous anhydrous ammonia (sometimes classified as a high-pressure liquid), and low-pressure and non-pressure liquid nitrogen solutions (both solutions in water) as forms of straight nitrogen fertilizer are discussed in Extension Circular A-242, "Forms of Nitrogen Fertilizer". Some of these, especially anhydrous ammonia and 28 - 32 per cent nitrogen non-pressure type, are being sold and used in North Dakota.

#### **LIQUID MIXED FERTILIZERS**

Some small liquid fertilizer plants have been established in North Dakota that make up clear water solutions of fertilizer materials in various combinations of nitrogen, phosphorus and potassium. Proportions of these three nutrients can be varied to fit different crop and soil conditions. Such solutions can be used in place of dry mixed fertilizers with similar ratio. Farmers in some irrigated areas add these liquid fertilizers to the irrigation water as a

field is being irrigated. Suspension liquids are a new development in liquid mixed fertilizers. In these, some fine solid material is held in suspension in addition to material in solution. Higher analysis liquids are possible with additional material in suspension.

These liquids cost about the same as other forms of fertilizer.

#### **LIQUIDS SOLD FOR LEAF FEEDING AND SEED TREATING**

Liquids are being sold in North Dakota under several brand names both as straight nitrogen material and as mixed fertilizers for leaf feeding or seed treating methods of application. These are water solutions of soluble fertilizer material. Prices usually charged per gallon makes the cost per pound of nutrients several times that of the same nutrients in dry forms of fertilizer, or liquids for soil application.

#### **LIQUIDS VS DRY FERTILIZERS**

Water solution liquid fertilizers differ from dry solid forms only in that the fertilizer salts have been dissolved in water. A dry crystal salt form, such as ammonium nitrate, may be dissolved in water to become a liquid fertilizer. The fact that it is dissolved in water does not necessarily make it more valuable than it was as a dry salt, nor does it mean that plants need less of the nutrient nitrogen when used as a liquid.

Pound for pound of plant nutrients contained, dry forms of fertilizer containing nutrients in available form should be just as effective as the same nutrients in liquid form.

### **METHODS OF MAKING SOIL APPLICATIONS**

Where fertilizers are to be broadcast on or in the soil apart from seeding, equipment is available to handle liquid and gaseous forms as well as dry materials. You can now get attachments for row crop planters and grain drills to apply liquids in the row at planting. With such equipment, you can put liquid fertilizers in the soil as effectively as you can dry material.

### **WETTING SEED WITH FERTILIZER SOLUTIONS**

The method of wetting the seed with liquid fertilizers before planting, as recommended by certain manufacturers, led to several North Dakota trials to compare the method and proposed rates with recommended rates of regular fertilizer as soil applications.

In most cases, the seed treatment method did not give any significant increases in yield, while regular soil applications gave significantly increased yields. Apparently, the seed cannot carry enough fertilizer to influence the crop to get measurable yield increases.

### **FOLIAR APPLICATIONS**

Leaves and stems of plants do take up nutrients from sprays or dusts. Leaf spray fertilizer applications are being effectively used with some woody species of orchard crops to supply the needs of the crop at critical periods of growth.

Some experimental work has been done with farm crops of cereals and forages. However, applicability of this method for regular farm crops has not been established. Stations that have conducted work with the method on field crops have so far concluded that it is not a practical way to supply the fertility needs of such crops.

Soil applied fertilizer in the early seedling and stooling stages of growth produces considerable beneficial effect on spring sown grains and other crops in North Dakota. Foliage sprays applied after the crop is up and covering the ground are too late to produce these early effects.

For these reasons, regular soil applications of fertilizer at planting time or before are recommended.

However, if needed fertilizer is not applied to the soil and the crop later shows signs of needing fertilizer nutrients, furnishing such nutrients through leaf sprays will likely give increased yield.

If you select a liquid fertilizer for such applications, you must consider the cost per pound of nutrient and an analysis that supplies the needed nutrients. Nutrients must be supplied in somewhere near needed amounts in order to significantly influence yields. There is danger of burning the leaves if too large amounts are applied in one spray. Several separate spray applications may be necessary to provide the amount needed. Not enough is known about safe rates of application. If you plan to fertilize a crop it is safest, and with present knowledge considered most efficient, to make the regular recommended soil applications.

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