FOR HIGHER CORN YIELDS --

USE FERTILIZER

By J. C. Zubriski

EACH year more than 1,000,000 acres of land are planted to corn in North Dakota. Some corn is grown in all parts of the state, but the greatest corn acreage is in the southeast where almost one-fourth of the land is planted to corn each year. A high proportion of corn grown in this area is harvested as ear corn. In other sections of the state, a relatively higher proportion is used for silage, pasture or fodder.

Compared with cornbelt states, corn yields in North Dakota are low. This is due in part to the short growing season, use of unadapted varieties, frequent unfavorable climatic conditions, insect damage and poor weed control.

It is also possible that much of the corn is grown under conditions of serious nitrogen and phosphorus deficiency which may be limiting corn yields.

To produce high yields of corn grain, or good quality silage, corn must have an adequate supply of plant nutrients in addition to favorable climatic conditions, weed control, disease control, insect control and desirable number of plants per acre. Many soils of North Dakota are not capable of supplying enough nitrogen and phosphorus, and in some cases potassium, to grow high yields of corn. These soils should be supplemented with proper commercial fertilizer to meet the high nutrient needs of a large corn crop.

Fertilizers will not substitute for other desirable management practices to obtain high yields.

The relationships of fertilizer treatments and of thickness of stand to yield have been investigated for many years in states where corn is a major crop, but there were few experiments to test fertilizer effects in North Dakota before 1953. Since then, from 4 to 9 trials have been planted each year to test the effects of various fertilizer combinations on yields, and during the past 3 years, 5

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trials have been conducted to determine the effect of both fertilizers and plant population on yield.

Corn yield data from these trials helped substantially in improving fertilizer recommendations for the corn crop.

Good results have been obtained by farmers and in field trials from a band application of fertilizer along the row or hill. The fertilizer recommended for band placement is generally a nitrogen-phosphate combination and, on sandy soils, a nitrogen-phosphate-potash combination. A rate of up to 40 pounds of nitrogen per acre is safe to place in the band.

For hilled corn grown on nonfallow land, 10 pounds per acre of nitrogen on relatively dry soils at planting, or 20 pounds per acre on favorably moist soils at planting, are a good nitrogen band placement recommendation. For drilled corn, double the amount recommended for hilled corn under similar soil moisture conditions.

If corn is to be grown on fallow land, there is less need for supplemental nitrogen. However, on many of these soils, as well as the nonfallow soils, phosphate fertilizer should be included in the band placement. The amount of phosphate to use depends upon the soil test rating but, in general, about 20 to 40 pounds per acre of available phosphate will produce good results on most soils.

For corn grown on sandy soils, up to 15 pounds per acre of potash should be included in the band fertilizer.

The fertilizer band should be placed about 2 inches to the side and 2 inches below seed level.

Since band placement of fertilizer for corn generally produces the greatest return in increased yields per dollar invested in fertilizer, it should be given first consideration for fertilizing corn.

In some cases the additional nutrients supplied by the recommended band placement and the available soil supplies are still not enough to meet the needs of a large corn crop. This is particularly true of very infertile soils and of moderately fertile soils during years of favorable climatic conditions and where thick stands are planted.

For highest yields under these circumstances, additional nitrogen or phosphorus or a combination of the two should be worked into the soil, preferably before planting, since adding more nitrogen to the band will cause germination injury and additional amounts of phosphate may be in a position unavailable to plants. The added fertilizer can be broadcast on the soil surface before plowing the land to be seeded to corn. In fields that have not been fallowed recently, between 30 and 40 pounds per

acre of nitrogen, in addition to that placed in the band, are recommended.

On fields that have been in a legume recently, or have been manured recently, up to 30 pounds of nitrogen may produce desirable results. The amount of phosphate to broadcast and plow under again depends upon the soil test rating, and approximately 25 to 30 pounds of phosphate per acre, in addition to the band placement, is enough for most soils. Broadcasting and plowing under potash fertilizers generally will produce only a very small or no increase in corn yields.

In general, the total amount of fertilizer recommended (band placement plus plow-down placement) for highest yields of corn for soils on which corn is commonly grown(nonfallow) is 50 pounds of nitrogen, 50 pounds of phosphate (not less than 25 pounds of phosphate per acre are recommended for plow-down placement) and up to 15 pounds of potash per acre on sandy soils.

During seasons of low rainfall and high temperatures, particularly during tasseling to silking stages of growth, fertilizer may not produce large increases in corn yields, even though large visual plant responses are noted earlier in the season.

When soil moisture conditions are favorable at planting, it is well to consider planting more plants per acre. Under these conditions, about 15,000 to 16,000 plants per acre are a desired stand. If soil moisture conditions are very poor at planting, do not plant more than 14,000 plants per acre.

Have your soil tested to determine the amount and kind of fertilizer to use.