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Fertilizer and Liming Practices
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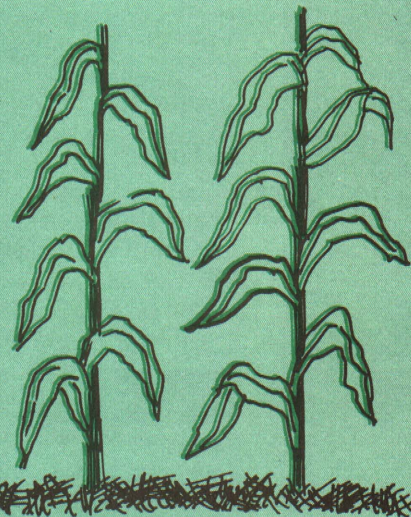
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No Till Corn: 2

Fertilizer and Liming Practices



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Fertilizer placement in a no-till system has been of some concern for several years. The problem is that no-till methods do not offer a means of incorporating large amounts of fertilizer or lime. Some data suggest that incorporation is not as essential as with other methods of tillage because roots are closer to the surface of the soil.

Phosphorus and Potassium Movement

Research has shown that surface-applied phosphorus moves no more than 2 or 3 inches from its original placement. Leaf analysis, however, shows comparable nutrient uptake between several tillage systems.

Supporters of the no-till concept offer the following explanation for the success of surface-applied phosphate. Less fixation of phosphorus occurs on the surface, which results in increased availability. Also higher soil moisture levels, due to the mulching effect of crop residues, allow for greater utilization of phosphorus. Similar theories are advanced for potassium, but movement of potassium is greater than that of phosphorus.

When taking soil samples, farmers should be aware of the differences of phosphorus and potassium movement patterns. Take soil samples to a normal plow depth and mix thoroughly to assure a valid interpretation of the fertilizer and lime recommendations.

Fertilizer Placement

Research on fertilizer placement shows that band applications of phosphorus are particularly important where soil phosphorus tests are low and soils are cold. Proper placement of starter fertilizer may be more difficult with the conventional no-till planters. As a result, it may be desirable to place fertilizer slightly more than 2 inches to the side, and 2 inches

below the seed, to insure good seed germination and avoid fertilizer injury. Some farmers have solved the problem by widening the tillage strip through the use of two fluted coulters.

Nitrogen Application

Surface-applied nitrogen normally does not cause problems because nitrogen fertilizers are soluble and move downward with water. Nearly all nitrogen fertilizers are acid forming, and consequently, the soil surface can very rapidly become acidic. Since the availability of phosphorus in the surface area is also affected by the soil pH, it may be advisable to lime more frequently with smaller amounts of lime or plow every 3 or 4 years to incorporate lime and fertilizer nutrients.

Anhydrous ammonia has been successfully used in the no-till system and will reduce the need for frequent liming because it is incorporated rather than surface applied. Applicator knives should be equipped with rolling coulters ahead of each knife and a packer wheel behind to prevent escape of ammonia from the slit made by the knives. Applying urea or 28 percent nitrogen (50 percent urea) solution to crop residues may also result in sizable losses of nitrogen by ammonia



No-till corn planted in bromegrass sod at MSU.