

Dribble fertilization ideal for no-till

LANCASTER — The popularity of conservation tillage, coupled with the increasing need to maximize fertilizer efficiency and reduce trips across the field, should give farmers more reason to dribble, or strip, part of their total fertilizer requirement.

Dribbling a coarse stream of liquid fertilizer, in strips 10-30 inches apart, is not a new method for improving nutrient recovery and boosting crop yields. In fact, its origins can be traced to the late 1950's. The practice gained only limited acceptance at the time, however, because energy and fertilizer were relatively cheap and plentiful. Deep plowing, then a standard practice, also diluted the band and masked its effectiveness.

But today, as crop-production costs reach new highs, grain prices plummet and more farmers abandon the moldboard plow, the agronomic and economic advantages of dribbling fertilizer become more pronounced.

Everything To Gain

"Farmers practicing any form of conservation tillage have everything to gain and nothing to lose by making dribble applications," says Don Johnson, agronomist at Allied Chemical who has worked extensively with this technique under various tillage systems.

"Whether the fertilizer is left on the surface in a zero-tillage situation, or if it's chiseled beneath the stubble in reduced tillage, dribble applications should at least equal or, more often than not, produce a better crop yield than where the same rate of plant food was broadcast," Johnson says.

In an effort to fine tune their recommendations, most land-grant universities have just begun to evaluate the efficiency of various fertilizer-application techniques for conservation tillage. To date, the bulk of the research data has come from the Northeast, where hilly terrain prompted an earlier interest. In one study at the University of

Maryland, unplowed corn plots receiving a dribble application of urea-ammonium nitrate (UAN) solution averaged 146.4 bushels per acre, 35 bushels more corn than plots that received the same amount of fertilizer as a broadcast treatment. When the same test was conducted in fields that were plowed with a moldboard, dribble plots outyielded the broadcast plots by only five bushels per acre, thus demonstrating the greater efficiency obtained from dribble applications in conservation tillage.

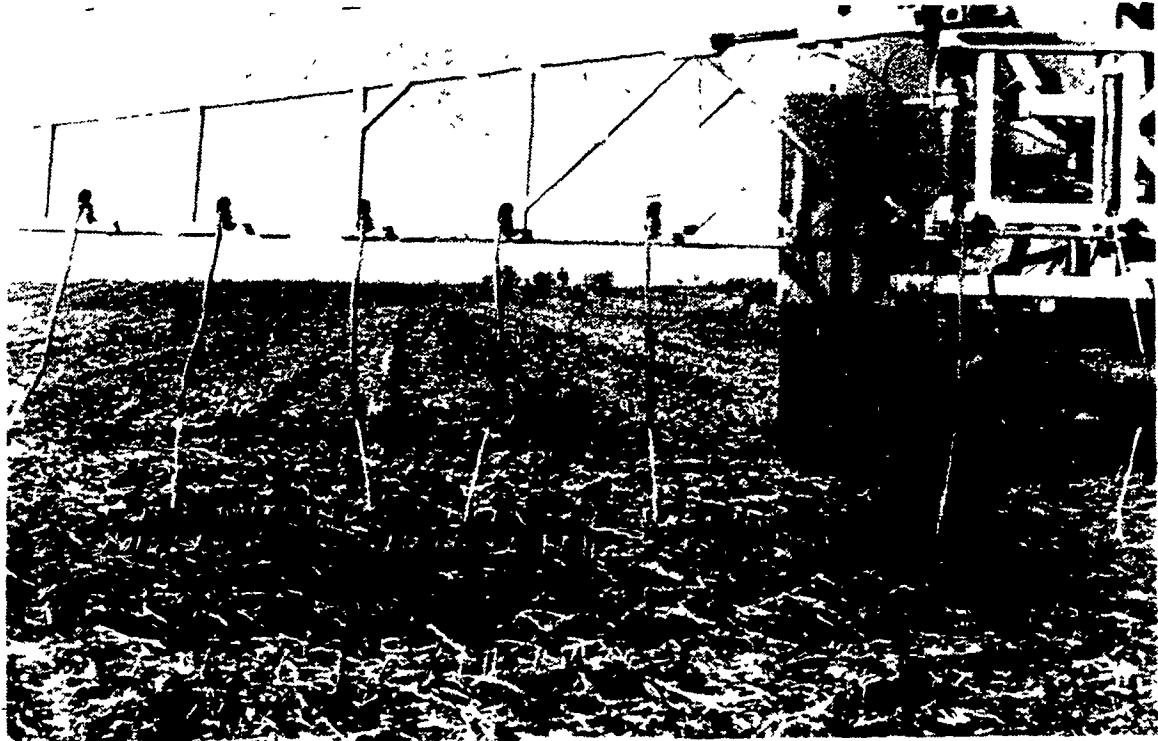
Crop-yield increases from dribble applications may not always be as dramatic as those recorded in the Maryland study. But Johnson says increases of 10 to 20 bushels per acre are typical in conservation tillage. Earlier crop maturity and lower moisture content at harvest are also probable.

Study Shows Need for Change

The need to adopt new fertilizer-application techniques for zero and reduced tillage was underscored in a recent study by the USDA. Researchers found that certain microorganisms, which feed on nitrogen and reduce its availability to crops, tend to accumulate in the top three inches of unplowed soils, rather than be dispersed throughout a six- to eight-inch plow layer.

For instance, populations of denitrifying enzymes were found to be 170 percent greater in the top three inches of no-till soils than in the same zone of plowed soils. This disparity probably would not be as extreme in reduced tillage, Johnson points out. But the results of these trials, which were conducted at seven different locations across the United States under a wide range of climates and soil types, show the importance of reducing fertilizer contact with crop residues and large volumes of soil.

"The less you till, the more you should consider dribble applications," Johnson says, noting

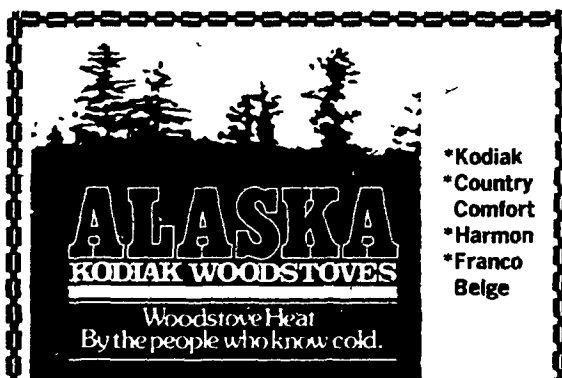


Close-up shows coarse stream of liquid fertilizer being dribbled onto crop stubble by custom applicator's modified spray boom.

that small droplets produced by broadcast applications may remain on plant residues and not effectively reach the soil surface. Subsequently, the fertilizer would not be taken up as readily by plants. It would also be more vulnerable to micro-organisms.

Dribbled fertilizer, on the other hand, saturates the residue and reaches the soil surface. The high concentration of fertilizer "overwhelms" nitrogen-robbing microorganisms, Johnson says, to protect the nutrients from loss or nonavailability.

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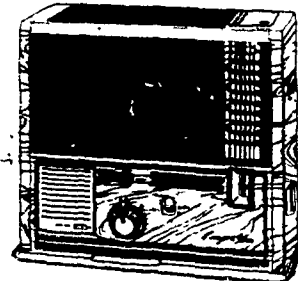
In zero-tillage, where seed is drilled into the stubble of a previous crop, fertilizer application is the only opportunity to ensure proper nutrient placement, Johnson observes. "You could knife in nitrogen four to six inches deep, but that requires energy and in effect becomes a tillage operation," he says. "That's why dribbling has so much potential." Dribble applications in zero-tillage should not be made before early spring, however, to protect the fertilizer from the elements.

Because farmers practicing reduced tillage have the option of chiseling dribbled fertilizer beneath the soil surface, fall applications can be made with confidence. While chiseling and light diskings behind the dribble will break up the band to some degree, the fertilizer will still be much more concentrated than if it had been broadcast and plowed under, Johnson says.

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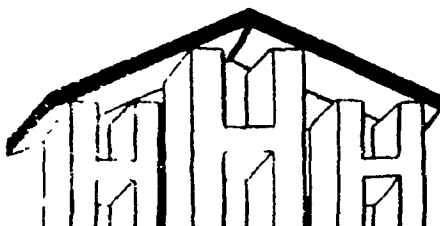
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