

Nitrogen stabilizer developed

(Continued from Page 1)

with anhydrous ammonia or urea solution fertilizers at rates equivalent to one-half to one quart per acre, N-Serve tends to increase yields, or maintain yields in the face of decreased use of these fertilizers. Disease resistance is also enhanced.

For example, of 126 tests for which data had been tabulated by December 1, 1975, a total of 104, or 83 percent, showed

yield increases, according to R. L. Tennant, Dow's Manager of Plant Nutrition. N-Serve failed to increase yields in only 22 of the tests, and these were instances where conditions for nitrogen losses did not occur.

The tests were run on the four crops for which the stabilizer is registered — corn, wheat, grain sorghum and cotton — at more than 50 locations across the country. In addition, many other growers not formally involved in the tests reported similar successes with both fall and spring application of N-Serve.

Ecological benefits also occur from the use of N-Serve because it minimizes the volatilization and leaching loss of nitrogen incorporated in the soil prior to planting. It achieves this by controlling many of the Nitrosomonas bacteria which normally are responsible for the conversion of ammoniacal nitrogen to nitrite nitrogen. Therefore, the nitrogen remains in the ammoniacal form attached to soil particles, instead of converting to a form of nitrogen which can be carried off by rain or irrigation waters.

In fact, soil scientists estimate that only half of the nitrogen farmers apply is utilized by their crops. The rest is lost through natural biological conversion, denitrification, leaching, and volatilization processes.

Research indicates that N-Serve can cut this loss from 50 to only 30 percent and sometimes much less, Tennant says. This explains the success of fall fertilization with nitrogen plus N-Serve in the corn belt. There, historically, nitrogen application has been held off until the soil temperature drops to 50 degrees F to minimize nitrogen leaching. By then, too often there has not been enough time left to do the job.

However, with the addition of N-Serve, nitrogen can be applied sooner, and with N-Serve he can apply nitrogen at the spring rate.

According to research at Purdue University, N-Serve — or nitrapyrin in chemistry language — is expected to give best results when applied to light soils which are subject to leaching losses, or to heavy, wet soils where denitrification is likely. This is especially true in years that are excessively wet and/or cold and where nitrogen is early-fall applied.

On the other hand, Purdue scientists point out that there will be little or no yield benefit in those soils or years with little N loss caused by leaching or denitrification. No significant response would be expected where excessive rates of nitrogen were applied to compensate for leaching or denitrification losses. No response would be expected if the

nitrogen fertilizer used did not contain significant amounts of the ammonium form.

Dow notes that N-Serve would benefit dealers and custom applicators from fall application because it enables them to level their peak work loads. And manufacturers of nitrogen benefit because fall fertilization comes at a time when they would otherwise have to shut down production due to lack of storage capacity.

Protein and Lysine content of grains is also increased by the use of N-Serve, says Tennant. Current research shows that — contrary to earlier belief — seedling crop plants better utilize nitrogen in the ammoniacal form than as nitrates. Perhaps even more significant, holding N in the ammoniacal form for the longer period mitigates certain crop diseases, particularly Pythium and Diplodia stalk rot of corn, footrot, or take-all and Leopard-Spot in wheat, and Verticillium wilt and Texas root rot of cotton.

This disease reduction results in part simply from growing a healthier plant free of nitrogen stress, Tennant explains. But in the case of Pythium and Diplodia stalk rot of corn, there is a more direct relationship: both these diseases actually feed on nitrate nitrogen. Overall, though, most corn growers have reported healthier, stronger stalks growing on acreage treated with N-Serve.

While researchers dig deeper into these relationships, Dow has ample evidence indicating N-Serve will earn its way in yield increases anytime the amount of N applied is less than that which can be utilized by the crop being fed.

"In some cases," Tennant says, "a farmer can use 20 percent less fertilizer without appreciable reduction in yield if he adds N-Serve. But, unless we come into a period of critical shortage of N, we'd rather see him add N-Serve to the same amount of nitrogen he's using now and increase his plant population or reduce row spacing to make better use of the 'extra kick' N-Serve gives him."

In any event, he adds, N-Serve is good medicine when nitrogen is a limiting factor, either because application is at a rate less than optimum, or because of nitrogen losses that have heretofore been beyond the farmer's control. Best response usually can be expected in light soils subject to leaching or in heavy water-logged soils.

However, throughout central and northern Illinois, for example, corn growing conditions were just about optimum in 1975 and the need for N-Serve might have been thought minimal. Yet the additive still increased yields substantially. Typically, Donald Hubbard, who farms 292 acres southwest of Lincoln, Illinois, fall-fertilized in 1974 about 18 acres with 160 lb.-acre of N plus N-Serve and another 16 acres with 160 lb.-acre of N alone. The plot treated with N-Serve yielded 197.11 bu.-acre adjusted to 15½ percent moisture and the plot without N-Serve produced 190.45 bu.-acre. This yield difference of 6.66 bushels netted Hubbard an extra \$13.15-acre.

"If you like corn, don't skimp on the nitrogen," adds Hubbard who has been farming for 42 years. "And with N-Serve, the nitrogen will be there when you need it. I'm really sold on it for fall application."

At Land-O-Lakes' Answer Farm near Fort Dodge, Iowa, researchers added N-Serve to 100 lb.-acre of N and harvested 127.9 bu.-acre of dryland corn — nine bushels more than was produced on similar land receiving the same amount of N without N-Serve. At \$2.70 a bushel, the "profit" after cost of N-Serve would have been more than \$20-acre. Surprisingly enough, a field treated with 140 lb.-acre of N produced less — 113.3 bu.-acre. When N-Serve was added at this rate, the yield went up to 120.1 bu.-acre — 6.8 bu.-acre more than without N-Serve.

Says Tom Nauman, fertilizer specialist for Land-O-Lakes, a large cooperative serving some 50,000 growers in six corn belt states. "We feel real confident we can duplicate these gains next year — particularly if we have a wet spring again. This speeds nitrification and accelerates fertilizer losses. If you knew you were going to have ideal conditions, then maybe you wouldn't want to use N-Serve. But the way we look at it, it's good low-cost insurance."

Dr. Cleve A. I. Goring, head of Dow Chemical U.S.A.'s

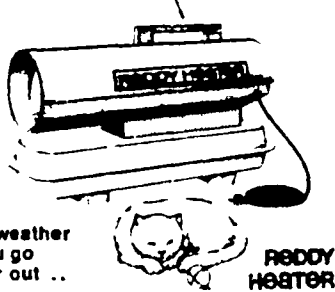
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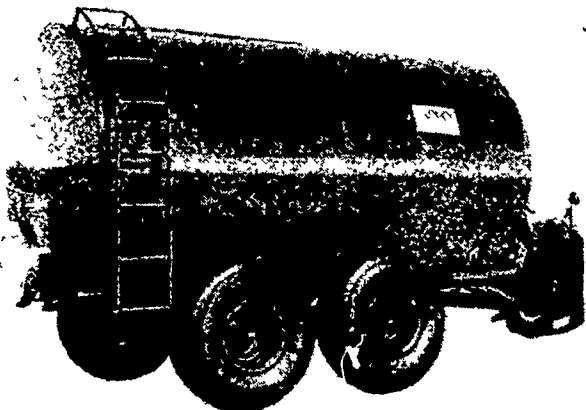
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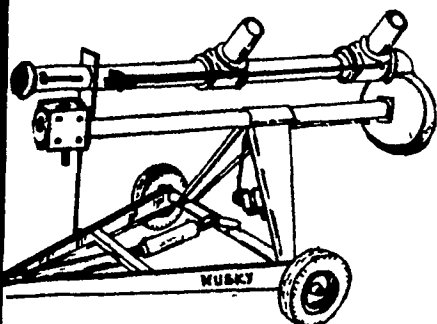
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