

Increased soybean seeding overcomes herbicide effects

ST. PAUL, Minn. — Increased soybean seeding rates reduced detrimental effects of atrazine and metribuzin herbicides on soybean yields during a 2-year study by Robert N. Andersen, research agronomist at St. Paul, Minn.

"Soybeans can be severely damaged by atrazine carryover from application on corn the previous growing season," Andersen says. "In the case of metribuzin, soil applications are commonly made for weed control in soybeans and the margin of safety is not great. High rainfall can increase injury from both herbicides."

Results of the 1978 and 1979 tests suggest that a grower using wide rows would increase the

probability of higher yields if he increased seeding rates in fields where he expects a problem with atrazine carryover or where metribuzin might be expected to cause damage," Andersen says.

Andersen conducted the research on plots at the University of Minnesota Agricultural Experiment Station, Rosemont. Herbicides were disked into the soil in late May and soybeans were planted the following day in both years. Three application rates were tested for both herbicides — ½ pound, 1 pound, and 1½ pounds per acre.

Three seeding rates were tested: a normal rate of 60 pounds per acre, and higher rates of 90 and 120

pounds per acre.

In the 1978 tests, higher seeding rates improved yields, Andersen says. High rainfall levels for 6 weeks after planting probably increased herbicide injury.

When atrazine caused a problem at the rate of ½ pound per acre, as happened in 1978, the 60-pound seeding rate produced at 35.2 bushels per acre, the 90-pound rate at 40.5 bushels, and the 120-pound rate at 41.2 bushels.

Atrazine treatment reduced the plant population about 30 percent compared to untreated plots. Increasing the seeding rate by 50 percent brought the plant population back up to that of the nontreated plots, Andersen says.

In 1979 under dryer conditions,

seeding rates did not affect yield significantly when atrazine was used at ½ pound per acre. However, at atrazine rates of 1 pound and 1½ pounds per acre, obvious benefits were gained by increasing the seeding rate.

Plots seeded normally at 60 pounds per acre, and treated at 1 pound of atrazine per acre, produced at 35.1 bushels. Plots treated with the same amount of atrazine and planted with 50 percent more seed yielded at 38.4 bushels and those where the seeding rate was doubled at 39.8 bushels.

Plots treated at ½ or 1 pound of metribuzin per acre in 1979 did not suffer sufficient yield reductions to benefit from increased seeding

rates. But, at the 1½ pound rate, yield was improved by both the higher seeding rates. The normal 60-pound rate produced at 28.6 bushels, the 90-pound rate at 31.6 bushels, and the 120-pound rate at 35.4 bushels per acre.

Hodgson variety soybeans were used in the experiments and lodging was not a problem. Other varieties or different growing conditions might cause lodging with the higher seeding rates, Andersen warned.

These results support the theory that, for wide-row planting, increasing seeding rates will increase the probability of high yields from soybean crops in fields where herbicide problems are expected, Andersen concludes.



Conducting research on plots at the University of Minnesota Agricultural Experiment Station in Rosemont, Robert Andersen, research agronomist, found that increased soybean seeding rates reduced detrimental effects of atrazine and metribuzin herbicides on soybean yields.

Improved forage crop management Save\$ millions

LEXINGTON, Ky. — Plant diseases now costing forage growers millions of dollars a year could be controlled by intensive management and disease research, a USDA plant pathologist said here recently.

Speaking to scientists gathered at the fourteenth International Grasslands Congress, Kenneth T. Leath of the U.S. Regional Pasture Research Laboratory in University Park, Pennsylvania, called for vigorous action to stop the millions of dollars of forage crop damage done by fungi, bacteria, viruses, nematodes, and air pollution.

For alfalfa alone, forage and seed losses in the United States annually amount to \$400 million, Dr. Leath said. The cost for all forage crops is believed to be much greater.

Leath stressed the need to improve present management practices, which are generally effective and economical. Even a brief lapse in good management, however, can cause great loss he warned.

Part of the problem is that forage crop damage is usually not immediately obvious to the grower. Forages are commonly sold in bulk, are of relatively low cash value per acre, and are used mainly on the farm where they are grown. Diseases which often attack the roots are difficult to detect. They are also chronic, taking a small but continuous toll in yield and quality over a long time.

"We cannot continue to be complacent," Leath said. "Fundamental research into pathogen biology and disease development must first be done. Then models for controlling these diseases must be developed and incorporated into

overall crop management models."

Successful models for disease control recognize that certain production practices contribute to disease prevention. Controlling insects and weeds and fertilizing the forages, for example, are doubly valuable. Weeds not only compete with forage plants for space and nutrients, but also serve as alternate hosts for pathogens. And fertilizing with potassium not only promotes vigorous growth, but reduces root pathogens.

The immediate future is not likely to bring major changes in forage crop management, Leath said, although the effects of new techniques, such as sod seeding and chisel plowing, are not known. But intensifying present management strategies, adapting forage crops to their environment, and judiciously applying established techniques will appreciably reduce staggering economic losses. The eventual emergence of forage crops as a major market commodity will benefit and intensify the study and control of forage crop diseases.

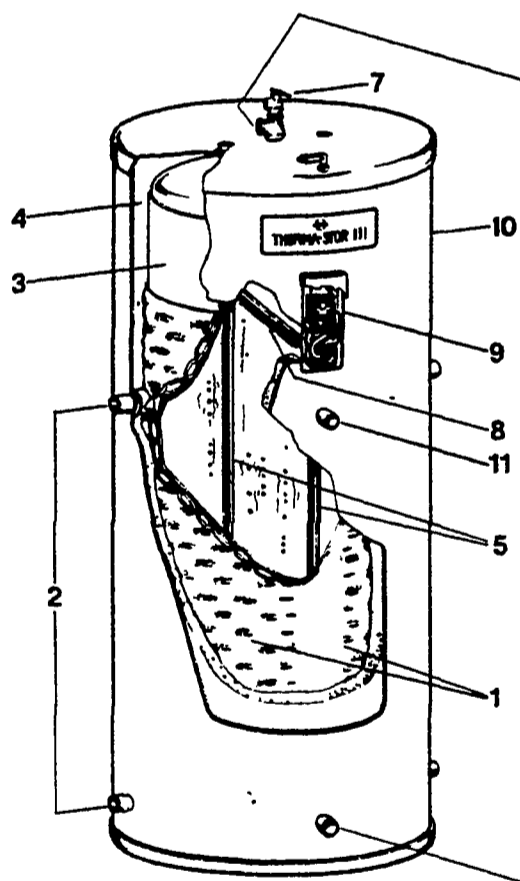


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