

# Rye May Absorb Excess Nitrogen

(Continued from Page A1)

of maximizing those windows when a farmer can produce a crop."

Research on the "biomass," or amount of living matter generated by plant test plots, has been undertaken on the dairy and poultry farm of Paul Clugston in Halifax, a town north of Harrisburg. By knowing the total biomass produced on specific plots, technicians can pinpoint how many pounds of nitrogen are being taken up by the rye.

## Effects of manure

Plots of land measuring 20 feet by 1,000 feet, totalling approximately 7.6 acres, were used to test the effects of nitrogen from manure on rye. The rye was seeded in mid-November last year. One plot had no rye, but was broadcast with manure. In another plot, manure was spread in one rye strip; still

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another rye strip received no manure. The rye growing in the manure plot grew higher with more density than the one without manure.

"You can see the difference where the manure was applied and where it wasn't," said Clugston, who farms 219 acres of land. His operation includes 101 cows and 95 heifers and calves. In addition, Clugston raises 134,000 broilers per cycle, under contract to Penfield Corporation.

Multiple observations — three replications of the same treatment in a randomized pattern — of the rye grown in the manure-treated

and non-manure areas will determine how much of the nitrogen from the manure was taken up by the plants.

Corn will be planted under the same conditions to determine the effects of the previous rye cover crop on the growth of the corn.

## Other objectives

Other test objectives, according to the researchers, are to determine the leaching of nitrogen; the effects of planting a sorghum and Sudan grass hybrid forage crop on absorbing excess nitrogen; and how the rotational cycle affects nitrogen in the soil.

"Sometimes things look good on paper, but what's important is to see how things actually work out on the farm, and how it works in with the cycle of cropping systems, and what are the labor, machinery, and weather constraints farmers are facing," Weber said.

He said that farmers grow the rye to produce forage for dairy. "He has to balance two things — he wants to get maximum rye production, which requires some nutrients." At the same time, after corn is planted, the farmer wants to "minimize the amount of nutrients that are going to get in the groundwater system compared to what gets into the crop," he said.

Some farmers spread the manure or place liquid nitrogen down when they plant. Unfortunately, if a heavy rain follows, much of the nitrogen is washed away or leached into the groundwater. "But if the rye is planted early, this does not seem to be a serious problem," said Lanyon.

## Reduce leaching

"So you can reduce the risk of leaching if you just put a small amount of nitrogen there to get it started and then come in a little later and sidedress — making nitrogen available to the plant when it's going to be taking up the greatest amount," he said.

According to Weber, by combining the nitrogen application with the cultivation, farmers can reduce the risk of runoff or leaching from heavy rains.

"Farmers," he said, "can pile on the nutrients and get back lots of production. But there can be some off-farm consequences, in terms of what's really happening to the environment. So what we have to do is balance what we're doing



"You can see the difference where the manure was applied and where it wasn't," said Paul Clugston, who farms 219 acres of land in Halifax, Pennsylvania. In the left, manure was spread for the rye cover crop; on the right, where the stalks are smaller, no manure was spread.

with our nutrients in terms of being able to get the production that the farmer needs and, at the same time, to minimize the effects off the farm."

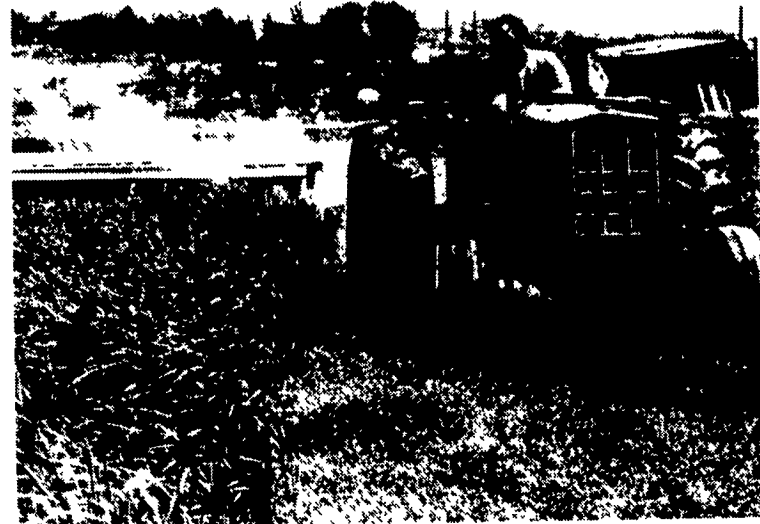
Rodale Institute and Penn State are working with the farmer to "put some of these things out on the field and see what works and what doesn't," said Weber. "What are the limitations, what are the constraints that farmers

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face in trying some different management techniques?"

## Plant earlier

"Rye can be planted later than



Paul Clugston harvests the rye crop on his farm in Halifax, Pennsylvania. The rye is used for forage for his dairy operation.

other winter cereals," said Lanyon. "But early planting will contribute to earlier harvest and better nitrogen uptake in the fall."

Because the rye can be planted earlier, it can be harvested earlier, which gains time to plant corn and speeds the demand for labor. The time is crucial, because weeks — and money — can be lost. In Clugston's case, the sorghum and Sudan grass hybrid forage crop can be harvested before corn silage harvest, which allows him to plant rye earlier.

"Plus," said Lanyon, "the sorghum and Sudan grass hybrid can be planted after the ideal times for corn planting with little yield loss. This flexibility spreads the spring work load."

"I put a lot of effort out working with Penn State," said Clugston. "I don't get paid for any of this. But the information that I can collect from this and try to use it is hopefully where the benefit is."

"I think everybody's becoming aware that there are some problems in terms of what's happening with our groundwater," Weber said. "And there are a lot of farmers who are very conscious of it and very conscious about land stewardship. Not all the good ideas that farmers are incorporating come from universities or private research places, but it's the farmers themselves, creative people, who have come up with a number of creative management techniques that work."

## Lancaster Girl Wins Scholarship

SHOEMAKERSVILLE (Berks Co.) — Aimee Eoepchino, a senior at Conestoga Valley High School in Lancaster is the Region I winner of Keystone Farm Credit's Annual Scholarship.

Region I, for purposes of Keystone's scholarship program, consists of Chester, Delaware, Lancaster, Lebanon and Lower Dauphin counties.

Ms. Eoepchino is the daughter of Dr. and Mrs. Alfred Eoepchino; she plans to enter Penn State University where food science will be her major emphasis of study.

In addition to her outstanding scholastic achievements, Ms. Eoepchino participated in school as a member of the cross country track team, editor of the yearbook and as a cheerleader; she was involved in both music and drama, and is a member of the National

Honor Society. She attended the 1989 PA Governor's School for Agricultural Sciences, is a Girl Scout, a member of her church youth group, does community volunteer work and is listed in Who's Who Among American High School Students.

Applicants for Keystone's scholarship award must be a high school senior, live in Keystone's 15 county territory, and plan to major in a field of agriculture or agri-business at a four-year college on a full-time basis.

Keystone Farm Credit, ACA serves the agricultural community in southeastern Pennsylvania with long-, intermediate-, and short-term loans as well as other varied financial products and services. It also provides country home mortgages for eligible properties.



Leon Weber, on-farm specialist with the Rodale Institute, points to a field that was sampled. Plots of land measuring 20 feet by 1,000 feet, totalling approximately 7.6 acres, were used to test the effects of nitrogen from manure on rye. The rye was seeded in mid-November last year on the Clugston farm test plots.