Corn Talk News

# RESEARCH UPDATE

CORN TALK NEWS
PENNSYLVANIA MASTER CORN GROWERS ASSOC., INC.

## RYE, MANURE AND NO-TILL IN CORN SILAGE DEMONSTRATION

**Dr. Greg Roth**
**Penn State Agronomy**
**Asociate Professor**

**Mel Brown**
**Centre County**
**Extension Agent**

Many dairy farms face the same dilemma. They need to grow corn silage, they need to spread manure, and they would like to plant no-till corn to conserve soil and labor resources.

For many, results with no-till corn silage production have been less than satisfactory, while some others make the system work quite well.

A field demonstration conducted in Centre County during the past year addressed some of the management considerations necessary to make the system work more effectively.

The demonstration was conducted on the farm of John and Todd Ishler in Spring Mills and was sponsored by Centre County Cooperative Extension, Penn State Department of Agronomy, and the Pennsylvania Sustainable Ag Association (PASA). Agway and Pioneer Hi-bred also contributed to the project.

Two 8-acre third and fourth year corn fields were used to demonstrate rye cover crop management effects and to assess the practical problems from using a rye/corn silage system in Centre County.

In late September, rye was no-tilled into ⅔ of each strip. Fall rye growth was excellent and in November the fields received 6,000 gallons of dairy manure. The rye was completely and uniformly covered with manure at that point. Almost immediately, the field was covered with snow for most of the winter, except for the January thaw.

The rye and manure appeared to limit erosion fairly well, since, during the winter, runoff caused some erosion in the bare strips but not in the areas seeded to rye. By spring, the manure had decomposed to the point that it was difficult to see much evidence of it.

Based on this experience, it appears that corn stubble fields with a good rye cover crop are excellent candidates for fall-applied manure. They limit erosion and provide a good no-till seedbed in the spring.

In the spring, the rye was killed at two different dates with an application of Roundup Ultra with 2,4-D added for broadleaf weed control. The herbicide was applied on April 18, when the rye was 4-5 inches tall or on May 4 when the rye was 8-10 inches tall. Because of wet weather, planting was delayed until May 15.

The soil under the late rye kill dried out more slowly because of the mulching effect and was marginal at planting. Soil conditions in the early kill and no rye plots were excellent. The rye residue from the early rye kill decomposed rapidly and was minimal at planting. Stands were good in all treatments, averaging 24,000-26,000 plants per acre. Plant growth was good as well, except that the late killed rye was slightly yellow for about two weeks early in the season.

We concluded from this that the early kill treatment gave us the best compromise of the three treatments: good overwinter erosion control, a reduced potential for possible allelopathic effects from the rye, and minimal residue to interfere with planting and soil drying.

In mid-June, we used the PSNT to estimate the N requirement on the field. The test called for 75 units of N, which was applied at the eight-leaf stage. By this time most of the rye residue from the late planting was decomposed. Growth was good in all plots throughout the season. Two row strips were harvested from the middle of each plot for the length of the field. The late-killed rye treatment averaged 27.1 tons/acre, the early killed rye averaged 26 tons/acre, and the no rye treatment averaged 24.6 tons/acre, all at 65 percent moisture.

We speculate that some of the advantage of the rye treatments may have been that they helped to conserve some of the manure nitrogen that was lost in the no rye treatment. This was probably more important this year than usual because of the excessive rainfall that occurred during the season.

We concluded from this demonstration that no-till corn can be successful in a manured rye cover crop system, but careful management is important.

Avoiding soil compaction, spreading manure in fall rather than late spring, timely rye planting and kill, and careful nitrogen management are all components of the system that need to be addressed to make it work well.

Producers who attended the field day indicated that they often encounter problems with late spring manure applications that make no-till corn silage production difficult. Consequently, not all corn fields may be candidates for this system. On those that are candidates, however, we can take advantage of the labor savings and reduction of soil erosion and runoff that the no-till system provides.

# New Products Stabilize Markets

ST. LOUIS, Mo. — The National Corn Growers Association's list of research initiatives target new products that could potentially utilize up to 100 million bushels of corn a year.

"Corn growers want significant growth and meaningful results," said Russ Williams, chairman of the organization's research and commercialization committee.

The Leaf River, Ill., farmer addressed more than 300 scientists and researchers who attended the NCGA Corn Utilization Conference in early June.

The NCGA facilitates research that will bring new, corn-derived products to market. One of those products could be commercialized as early as this fall.

Numerous companies are racing to convert corn-derived polylactic acid into 100 percent biodegradable plastic products.

Todd Werpy, director of research and business development for the NCGA, said using the corn-derived chemical is more economical than using chemicals derived from petroleum.

"It's headed toward commercialization," said Werpy. "The only issue now is volume."

Werpy expects compost leaf bags to be the first product consumers see from plastic made using corn-derived polylactic acid.

Other promising areas of research include using corn-derived butanol as a solvent in such things as brake fluid and lacquers, using corn-derived acetic acid to preserve food, converting corn-derived carbohydrates into non-toxic printers ink and anti-freeze, and converting corn-derived pentose which could lower the cost of producing ethanol.