

# Fertilizer Applications

## Study Focuses On Timing Of Nitrogen Treatments In Corn

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### ST. JOSEPH, LA.

Nitrogen management in corn is part of a three-year study conducted by Dr. Rick Mascagni, feed grain, small grains agronomist at the Northeast Research Station at St. Joseph and the Macon Ridge Station in Winnsboro.

“This year was really a challenge,” he said. “We had almost two inches of rain one weekend in mid-July and that was the most rain we had gotten here in the past three months. So it’s really been a challenge.”

His nitrogen tests were conducted on both irrigated and non-irrigated land. While the price of nitrogen fertilizer has come down a bit, this trial is aimed at improving nitrogen fertilizer efficiency by putting out a base rate early in the season, then come back later and add a supplemental amount as late as silk emergence.

“We’ve looked at some of the remote sensing technology to see if that can help us predict whether or not we need the late nitrogen,” he added.

In the three years of the study there has been some response to the late nitrogen. However, it seems that if you look at the total amount applied – 180 pounds right after emergence of the plant, and 60 pounds at silk emergence, a total of 240 pounds – there is a yield response; but if that same rate is applied early in the season there is no difference.

“That seems to be fairly consistent,” Mascagni said. “As a matter of fact, some years the single application early on does better; so in that case the plant may be a little deficient at the time of those late nitrogen treatments. However, we have never had a higher yield with putting it on late compared with that total rate applied early. That is of interest to me. We’ve done this on the clay soil as well as the silt loam soil here at St. Joe. That is the bottom line as far as looking at the summary of the three-year data.”

Because the yields were not different and there are all kinds of variables, the trial will be continued. A good yield this year could be attributed to a lot of rain. However, with a lot of rain there could be a loss of nitrogen through denitrification. Also, there could be poor inefficient nitrogen uptake by the plant; the environmental conditions may account for different results.

“Right now, based on this three-year study, you might just want to put it all out early; but again in some years, you may have that year where you expect a high yield potential because the conditions are good, but that’s hard to pin down.

“Nitrogen is such a dynamic animal in the soil, it’s just so hard to predict,” he said. “We have several researchers here at LSU working with nitrogen management of various crops. It’s hard to manage because of the complex nitrogen cycle involving environmental factors interacting with the plant and soil.”

In July, Mascagni predicted that farmers who irrigated in a timely manner would have good yields. However, corn not irrigated would be hurting. He predicted there would be a wide range in yields in a field where part was irrigated and part non-irrigated.

“Our non-irrigated will probably cut 30 to 40 bushels, because a lot of plants have barren ears; they just don’t have any grain on them at all because of the dry conditions, particularly in June and through mid-July. Corn planted in March typically silks out about the last week of May; since pollination and grain fill occur in June, a lack of moisture then can really hurt yields.”

A side topic discussed by Mascagni was aflatoxin.

“Aflatoxin is produced by the fungus, As-

pergillus flavus, which is everywhere in nature,” he said. “It’s the fungus that causes the decay of dead animals. It also infects corn and when you have real dry conditions particularly in combination with high heat like we had in 1998 it can produce a toxin called aflatoxin.”

The USDA has a threshold level of 20 parts per billion and elevators will check for it if they suspect it is there; it can be a problem with feed, especially feed for dairy cows,” he said. “There are some things we can do from a practical



**Dr. Rick Mascagni, Feed Grain, Small Grains Agronomist at the Northeast Research Station at St. Joseph and the Macon Ridge Station in Winnsboro discusses the nitrogen management in corn.**

Photo by John LaRose, Jr.

standpoint; farmers can watch for yellow plants along the dry corners of irrigated fields. That’s where it’s likely to be, predominately in plants that were stressed.

“Farmers may want to cut those corners separately, maybe bush hog some of that and not harvest it,” he advised. “Then, they can set the combine to blow out very small kernels that come from the tip of the ear, that are often insect damaged with high levels of aflatoxin. Harvesting early also helps. Those are some practical things to do if you suspect a problem.”

The presence of *Aspergillus flavus* is easy to recognize.

“If you pull back the husk, the organism is often on the tip where you often have insect damage,” he said. The kernel may be damaged from corn earworm or another insect and be olive green in color,” he said. “There is another fungus that’s an aqua, dark blue, or bluish green which is no problem. The presence of *Aspergillus flavus* does not necessarily mean that aflatoxin is present; however, if the plant undergoes stress it is more probable that the toxin is present.”

Stress comes in many forms. Heat and dry conditions, lack of nitrogen, and any factor that produces stress. There could be plenty of nitrogen in the soil but the plant just can’t take it up due to the lack of water and the movement of nitrogen to the root.

“Farmers need to watch for this particularly in non-irrigated corn that was stunted and stressed due to lack of water, fertilizer or a combination of both. They might want to harvest that separately or just bush hog it if it’s not too large an area,” he recommended. “I know you don’t want to leave too much corn on the ground but you sure don’t want to be rejected at the elevator either.” Δ

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