

CROP NUTRITION

By Karl Czymmek and Quirine Ketterings

Research tries to answer that question and many others dairy producers ask about starter nitrogen

Can you replace starter N with manure?

Dairy producers, looking to take advantage of on-farm nutrient sources, have asked if manure could be used to offset or eliminate starter nitrogen (N) on first-year corn fields. We were hard-pressed to answer that since our on-farm corn fertility studies have been on unmanured fields.

But since most corn fields on dairies receive manure, producers should ask whether manure can meet starter N needs for corn. To test different starter N rates, we conducted trials in 2006 and 2007 on a New York dairy.

In 2006, the producer identified a well-manured second-year corn silage field and used three treatments: no starter N, 30 pounds per acre and 60 pounds per acre. Each treatment was repeated three times in the field. In 2007, we repeated the trial on fields of first- and fourth-year corn.

Typical manure applications varied from 4,200 gallons per acre injected in the fall, plus 9,000 gallons per acre injected in the spring, to 12,000 gallons of spring injected manure without fall application. First-year corn typically received 4,200 gallons per acre surface applied the previous fall and no spring-applied manure.

The results were the same both years and in all three fields:

- No corn silage yield response to starter N in any of the situations tested. (See Table 1).

- Stalk nitrate levels were optimal for first-year corn and greater than 2,000 ppm (excess) for the second- and fourth-year corn sites.

We included forage analyses for the 2007 trials. The first-year corn showed a significant increase in corn silage protein level with the addition of starter N: 6.2% protein without starter N, 6.7% with 30 pounds per acre in the band and 7.1% for the 60 pounds per acre band application. However, the higher protein level didn't increase predicted milk per acre according to Milk 2006. For the fourth-year corn site, N starter didn't impact silage crude protein.

When we started this trial, the dairy producer had already dropped potassium (K) and phosphorus (P) from his starter fertilizer, based on previous research and soil test data for his dairy. After seeing two years of starter N data, he eliminated it last year on all but first-year corn fields. He planted quicker and reduced per-acre fertilizer costs to zero. The dairy producer reports corn silage averaged 24 tons per acre in 2008.

These trial results are encouraging, but we're not ready to suggest producers can safely eliminate starter N on manured fields. We need to do more testing at more sites. We have a grant for this work and starting in 2009 we'll initiate a starter N comparison study on dairies around New York State. If you want to participate, can make a two-year commitment and will machine harvest, plus have access to truck scales, please contact Quirine Ketterings at 607-255 3061. Email: qmk2@cornell.edu. □

FYI

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Table 1. Corn silage yield response to starter N

Corn year in rotation	Starter N rate	Yield (at 35% DM)		Milk/acre	Milk/ton	Crude protein % of DM
		Lbs N/acre	Tons/acre	Lbs/acre	Lbs/ton	
2006	2 nd	0	26.3 a	Not done	not done	not done
	2 nd	30	25.9 a	Not done	not done	not done
	2 nd	60	26.0 a	Not done	not done	not done
2007	1 st	0	27.2 a	32989 a	3461 a	6.2 b
	1 st	30	27.3 a	32354 a	3377 a	6.7 ab
	1 st	60	27.7 a	32597 a	3365 a	7.1 a
2007	4 th	0	18.0 a	21489 a	3401 a	7.5 a
	4 th	30	18.9 a	22307 a	3377 a	7.7 a
	4 th	60	18.2 a	21625 a	3393 a	7.5 a

When numbers are followed by the same letter (a, b, ab), we are 95% confident that any slight difference with other treatments are not due to the starter N treatment but to other variability in the field.

The Manager, a special section prepared by PRO-DAIRY specialists, appears in Eastern DairyBusiness 12 times a year. In keeping with the PRO-DAIRY mission, The Manager helps strengthen the management skills of dairy producers and increase the profitability of the dairy industry. PRO-DAIRY, an educational program begun in 1988, is a joint venture of the New York State Department of Agriculture and Markets, Cornell University's College of Agriculture and Life Sciences, and Northeast agriservice organizations. For reprints of PRO-DAIRY's The Manager, contact Heather Howland, 272 Morrison Hall, Cornell University, Ithaca, NY 14853. Phone: (607) 255-4478 Email: hh96@cornell.edu