

Effect of NutriSphere-N[®] on Urea for Corn Silage Production

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Introduction:

Improving the effectiveness of nitrogen (N) fertilizer applications on corn improves the crop's nutritive value and protects the environment. Both the grain and the plant matter are valuable as livestock feed.

Challenge:

Leaving N in the soil can lower yield and affect nearby water and air quality. Finding the most effective application rates, methods, and schedule for N applications helps growers improve crop quality while reducing environmental impacts.

Research:

Field trials conducted by Agriculture and Agri-Food Canada compared growers standard nitrogen source (urea) to urea treated with an enhanced-efficiency nitrogen manager called NutriSphere-N[®] (NN). The researcher compared several application methods, including pre-plant broadcast, banding at planting, and banding in-season after plants had emerged.

N application rates were chosen to bracket the typical application rate of nitrogen, in order to learn how best to raise high-quality crops without over-applying nutrients or investing in wasted resources. Researchers studied both tilled and untilled fields that have had treatments since 1997–1998.

Methodology:

The control field was treated with nitrogen and phosphate (MAP) as a starter at 20 kgN/ha. Urea was broadcast at 180 and 260 kgN/ha, and side-dressed at 180 and 260 kgN/ha. Urea treated with NN was broadcast at 180 and 260 kgN/ha, side-dressed at 180 and 260 kgN/ha, and side-banded at 180 kg/ha. Phosphorus was applied to meet crop needs.

Results:

The corn silage crop was measured for mature whole-crop dry matter yield, mature-grain dry matter yield, mature whole-crop dry matter, mature corn-tissue nitrogen, mature corn nitrogen uptake, and mature corn nitrogen uptake above control. The study showed positive results from the use of urea treated with NN through broadcast applications as well as banded applications.

Practical Applications:

With nearly every application method, corn fertilized with NN resulted in improved nitrogen uptake over corn fertilized with urea at the same rate, allowing growers to protect sensitive environments while creating high-yielding corn. The researchers also found that broadcasting gave better results than farmers' typical practice of side-dressing.

Mature Corn N Uptake Above Control 2013

Treatment	N Rate (kg/ha)	Tillage (kg/ha)	No-Tillage (kg/ha)	Avg (kg/ha)	
Control	20	0	0	0	F
NN-Urea					
Side-dress 4"	180	125	118	122	BC
Side-dress 6"	180	141	141	141	AB
Sband/Sdress	180	133	120	127	BC
Broadcast	180	123	74	99	DE
	260	178	105	142	AB
Side-dressed	180	143	101	122	BC
	260	173	132	152	A
Urea					
Broadcast	180	117	50	83	E
	260	172	107	140	AB
Side-dressed	180	123	89	106	CD
	260	162	159	161	A
Average		133	100	116	

LSD 21

P < 0.10