

Evaluation of polymer-coated urea as a fertilizer for corn

Problem addressed

Polymer-coated urea (PCU) is a new product marketed by Agrium and is designed to control the release of N from granular (solid) urea. It is marketed as "ESN". The release of N is controlled to be more nearly synchronized with plant uptake and prevent losses of N before plants grow.

Two-treatment trials with precision farming technologies were used to compare the performance of this new fertilizer material to commonly used fertilizer materials.

Fall-applied N for 2003 corn

Anhydrous ammonia and PCU were applied in alternating strips across 30 acres or more at each of three sites in Boone County. At two sites, the PCU was injected to a depth of 6 inches. At one site, the PCU was broadcast and disked into the soil.

Treatment	Rates lb N/acre	Yield bu/acre	
		PCU	Ammonia
Injected	130	192	191
Disked	151	177	176

Results showed that fall-applied ammonia and PCU performed essentially the same.

Spring-applied N for 2003 corn

PCU was compared to regular urea at two rates, 75 and 125 lb N/acre. Both products were banded to a depth of 6 inches, and corn was planted in the bands. The fields had been managed by no-till, the crop was corn after soybean, and no other N was applied.

Rates lb N/acre	Yield bu/acre	
	PCU	Urea
75	159	162
125	172	176

Results showed that spring-applied PCU performed essentially the same as spring-applied urea.

Spring surface-applied N on no-till soils for 2004 corn

PCU and urea were compared at two sites (about 40 acres each). Both materials were surface applied (without incorporation) shortly before planting. Additional N (32% solution) was injected in strips to learn if yields were maximized.

Treatment	Rate lb N/acre	Yield bu/acre
Urea	100	144
PCU	100	141
Additional N	50	168

Results showed that urea and PCU performed essentially the same. Neither came close to maximizing yields, so large losses of N probably occurred from both.

Spring broadcast and incorporated N for 2004 corn

PCU and urea were compared at two sites (about 60 acres each). Both materials were surface applied and incorporated shortly before planting.

Treatment	Rate lb N/acre	Yield bu/acre
Urea	100	194
PCU	100	199

Results showed that PCU and urea performed essentially the same.

Spring broadcast and incorporated N for 2004 soybeans

Strips with and without PCU (at 50 lb N/acre) were applied across four sites (about 30 acres each) shortly before planting. The material was incorporated at two sites with conventional tillage and not incorporated at two sites under no-till. The mean yield of soybean with PCU across the four sites was 58 bu/acre and 57 bu/acre without PCU. The lack of response should be considered evidence that soybeans usually do not respond to fertilizer N.

Conclusions

This new fertilizer material needs to be evaluated at additional sites and years.