

Nitrogen Stabilizer Effect on Nitrate Nitrogen Management in Soils

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SUMMARY

Preplant application of nitrogen stabilizer nitrapyrin held ammoniacal nitrogen at a higher level in the soil just prior to sidedressing than unstabilized nitrogen application. Soil analysis indicated that 79 percent of the measured ammoniacal nitrogen was located in the top 24 inches of soil and petiole analysis found nitrate content higher in treated soil.

Preplant application did not hold ammoniacal or nitrate nitrogen levels above untreated nitrogen at the end of the season, but nitrapyrin use in July sidedressing did decrease nitrate leaching. Both preplant and sidedressing use of nitrapyrin increased yield with a farm program using 142 pounds of nitrogen.

DISCUSSION

Nitrapyrin (N-Serve) was injected before planting when 15 gallons of 10-34-0 and 75 pounds of anhydrous ammonia were injected in the planting beds. Other plot replications remained untreated until one half of the remaining plots were treated with stabilizer while being sidedressed with 75 pounds of anhydrous ammonia on July 18. Soil of the plots with different treatments were sampled July 8 for ammoniacal and nitrate nitrogen content and petiole sampling occurred July 15, three days before sidedressing.

Preplant application of the stabilizer may have had less effect with an earlier sidedressing or larger nitrogen application. However, the use of a nitrogen stabilizer is suggested as a means of obtaining more efficient use of nitrogen and an opportunity to reduce leaching of nitrate into the ground water.

Nitrogen Stabilizer

Nitrogen Treatment	Soil Nitrogen Form	Soil Nitrogen p.p.m. - July 8			Total NO ₃ -N	Petiole NO ₃ -N 7-15 ppm
		Soil Depth				
		0-1	1-2	2-3		
N. Serve	Nitrate N	18	38	25	81	8220
	Ammonical-N	6.9	6.6	3.6		
No stabilizer	Nitrate-N	21	43	20	84	3960
	Ammonical-N	2.1	3.1	3.2		

Soil Nitrate - End of Season

Treatment	Form	Soil Depth			Total NO ₃ -N
		0-1	1-2	2-3	
Preplant N-Serve	Nitrate N	64	40	185	289
	Ammonical-N	2.0	2.7	2.7	
N-Serve Sidedress	NO ₃ -N	93	146	159	398
	Ammonical-N	1.6	1.7	1.7	
No stabilizer	NO ₃ -N	114	27	169	310
	Ammonical-N	1.9	2.0	1.9	

Nitrogen Stabilizer - Cotton Yield

Treatment	Lint Yield Lbs. Per Acre
N-Serve sidedressed	1447 a ¹
N-Serve preplant	1440 a
No stabilizer	1378 b

¹ Mean lint yields within the entire test that are followed by the same letter are not significantly different at the 0.05 confidence level according to Duncan's Multiple Range Test. Varieties above the space for each planting date are not significantly different in lint yield from the best variety for the planting date.