

EFFECT OF AMMONIA KNIFE SPACING ON CORN YIELD¹

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METHODS AND MATERIALS:

Experiments were conducted at DeKalb on a Drummer silt, Dixon Springs on a Alford silt loam and Elwood on a Blount silt to evaluate the effect of ammonia knife spacing at varying N rates and on different tillage systems on the yield of corn. Nitrogen was applied at 180 lbs N/acre at both DeKalb and Elwood and at 210 lbs N/acre at Dixon Springs in the knife spacing by tillage study. In the rate by knife spacing by time of application study at DeKalb, the preplant nitrogen was placed under where the rows would be planted.

RESULTS AND DISCUSSION:

Knife spacing by tillage: There were no significant differences in yield at any location due to knife spacing of sidedressed ammonia irrespective of tillage system (Table 1). Similar to the tillage work, knife spacing had no effect on yield even when evaluated over a wide range of nitrogen rates. This was true for both preplant and sidedress nitrogen.

The results of these studies indicate that application of nitrogen between every other row will be comparable in yield to injection between every row. This should be expected, as every row will have nitrogen applied on one side or the other when sidedressing is properly done. Even though the data from DeKalb looks favorable, additional work is needed before suggesting the wider knife spacing for preplant applications.

Use of the wider knife spacing at sidedressing allows producers to reduce the power requirement for a given applicator width or to use a wider applicator with the same power requirement. From a practical standpoint, the lower power requirement will frequently mean a smaller tractor and associated smaller tire making it easier to maneuver between the rows and also giving less compaction next to the row. With this system, knife positions can be adjusted to avoid placing a knife in the wheel track. When matching the driving pattern for planters of 8, 12, 16, or 24 rows, the outside two knives must be adjusted to half rate application as the knife will go between those two rows twice if one avoids the wheel track.

¹ Presented at the Seventeenth North Central Extension-Industry Soil Fertility Workshop, October 28-29, 1987, St. Louis, MO.

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Table 1. Effect of ammonia knife spacing with different tillage systems at three locations in Illinois.

Knife Spacing (in.)	Tillage			
	Plow	Chisel	Disk	No-Till
DeKalb - 1986 - LSD = NS				
30	159	157	163	146
60	158	157	157	143
Dixon Springs - 1987 - LSD = NS				
30	75	106		97
60	97	113		89
Elwood - 1986 - LSD = NS				
30		119	121	118
60		117	125	121

Table 2. Effect of knife spacing of ammonia applied at varying rates of N on corn yield - DeKalb.

Knife Spacing (in.)	N (lbs/acre)		
	120	180	240
Sidedress - 1985			
30	177	178	183
60	173	174	186
Sidedress - 1986			
30	166	175	180
60	167	168	178
Preplant - 1986			
30	159	178	190
60	166	179	180

PROCEEDINGS

Of the Seventeenth North Central Extension-Industry Soil Fertility Workshop



**St. Louis, Missouri
Oct. 28-29, 1987**



Published for
The North Central Extension-Industry Soil Fertility Workshop
by
Potash & Phosphate Institute
1220 Potter Drive, Suite 108B
W. Lafayette, Indiana 47906-1334