NO-TILL CORN PRODUCTION IN CRIMSON AND ARROWLEAF CLOVERS[1/]

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ABSTRACT

No-till corn production was greater with crimson clover than with arrowleaf clover. Arrowleaf was more difficult to suppress, resulting in increased competition to the corn. Broadcasting the herbicide generally resulted in better yields than banding. Mowing the clover top growth prior to planting resulted in reduced corn yields compared to broadcasting the herbicide. When clover top growth was removed, corn yields were greatly reduced. No yield response for the corn in crimson clover was obtained by addition of N up to 200 lb/A. At higher yield levels and under different moisture regimes, results may differ.

Continued increases in the cost of fertilizer N have resulted in increased interest in the use of legumes to supply N to other crops. Simultaneously, the advantages of "no-till" farming have resulted in dramatic increases in this practice. Several experiments have been conducted at the North Florida Research and Education Center at Quincy with no-till corn production in clovers. Clovers were established in the fall with P and K applied according to soil test results. Soil test results were also used to determine P and K application to the corn. Corn was planted no-till with subsoiling to a depth of 14-16 inches. Irrigation was supplied to the corn to maintain soil moisture tension below 20 cb at the 6 inch depth.

Table 1 shows results from an experiment to evaluate the potential for producing corn in crimson and arrowleaf clovers using several methods to suppress the clovers. Corn was planted in 30 inch rows on 4-12 and no was added to the corn. For any given treatment, corn yields are lower with arrowleaf than with crimson. Only when the clover was turned under were yields with arrowleaf above 100 bu/A. Arrowleaf was in a rapidly growing stage at corn planting, recovered from the Paraquat, and resumed growth to compete with the corn seedlings. Crimson clover matures and begins dying back about 4-15, making it easier to control with herbicides than arrowleaf. With crimson corn yields from the treatments using Paraquat were no different from the treatment where the clover was turned under. When no herbicide was applied, corn production was lower than with any other treatments. From this experiment is appears that crimson is more suitable for corn production than arrowleaf clover.

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Table 1. No-till corn production when planted into 2 clovers with several methods of clover suppression. NFRE Center, Quincy Fla. 1979.

Treatment	Crimson	Arrowleaf
	Bushels/Acre	
Paraquat broadcast @ planting	140 a*	87 a
Paraquat banded @ planting	129 ab	33 bc
Paraquat band @ plant, PQ middles later	111 abcd	51 b
Clover turned under	127 abc	117 a
No treatment, plant direct	97 cd	7 c

*Means in a column followed by same letter are not significantly different at 5% probability by Duncan's MRT.

Table 2 shows data from a similar experiment the following year with some additional treatments to evaluate the effects of forage removal on subsequent corn production. The highest corn yields with both clovers was obtained when Paraquat was broadcast at planting. This treatment gave higher yields in 1980 compared to 1979, especially for arrowleaf clover. Paraquat was applied with 50 gallons of water per acre in 1980 which resulted in better coverage than in 1979 when only 25 gallons per acre were used. This gave better suppression of the arrowleaf in 1980 resulting in reduced clover competition. Banding the Paraquat caused reduced corn yields with arrowleaf, but, as in the previous year, yields with crimson clover was essentially as good with banding as with broadcast application. When clover top growth was mowed with a rotary mower and corn planted directly into the residue, yield was as high as with banding Paraquat on crimson clover. With arrowleaf, yields were reduced considerably compared to broadcasting but were higher than with banding. When forage was removed as hay and corn planted directly into the stubble, yields were reduced considerably compared to the previous three treatments for crimson, but with arrowleaf yields were as good as with banding the herbicide. When forage was removed and the stubble turned under with a moldboard plow before planting, further yield reductions were evident with both clovers.

Table 2. Effect of method of suppressing 2 clovers on subsequent corn production. NFRE Center, Quincy, Fla. 1980.

Treatment	Crimson	Arrowleaf
	Bushels/acre	
Broadcast Paraquat @ planting	166 a*	144 a
Band Paraquat @ planting	148 ab	91 de
Mow, plant direct	143 b	115 bc
Harvest hay, plant direct	116 c	94 cd
Harvest hay, moldboard, plant	95 d	***59*** f

*Means in a column followed by same letter are not significantly different at 5% probability by Duncan's MRT.

Table 3 shows corn yields from an experiment to try to determine the amount of N crimson clover can supply to a following corn crop. Corn was planted no-till into the clover with Paraquat broadcast at planting. Corn yields were not affected by N applications up to 200 lb/A. From this and similar data it appears that corn yields above 1OO bu/A may be obtained with crimson clover without addition of any supplemental N under intense irrigation. For higher yields additional N will probably be necessary and results may be different with no irrigation or with different soil moisture management.

Table 3. Effect of N application on no-till corn production in crimson clover. NFRE Ctr, Quincy, Fla. 1979.

N Rate (lbs/A)	Corn Yield (Bu/A)
0	140 a*
50	120 a
100	139 a
200	143 a

*Means in a column followed by same letter are not significantly different at 5% probability by Duncan's MRT.

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