INTERSEEDING CLOVER WITH WHEAT FOR ESTABLISHMENT OF CLOVER RESEEDING SYSTEMS

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Using winter legumes as a N source for summer grain crops helps reduce the dependency on N fertilizers. Unless reseeding legume systems are used, however, seed and seeding cost of the legume can be as costly as the N fertilizer they replace. Advantages for reseeding legumes include substantial savings in production cost, and early establishment (mid August) which results in greater growth and N production than legumes seeded after summer crop harvest in October and November. Disadvantages for reseeding legumes include the elimination of winter grain crops, and late planting of summer grain crops (winter legumes such as crimson clover generally don't set seed until late April or early May). The purpose of this study was to evaluate the possibility of establishing intensitive cropping systems which would permit reseeding legume systems without losing the potential for winter grain crops, and also allow early plantings for summer grain crops. The cropping system used was wheat-clover combinations followed by no-till grain sorghum the first summer, reseeded clover the second winter, and early planted corn the second summer.

In mid November of 1982, two tests were established on a Lucedale fine sandy loam (Rhodic Paleudult). Wheat 'Coker 762' was seeded into prepared soil (disk-chisel-disk) at the recommended seeding rate (90 1b./acre). Crimson clover (Trifolium incarnatum L. var. Tibbee) was seeded simultaneously with wheat at rates of 0, 5, 10, and 15 1b./acre and alone at 20 lb./acre.

Nitrogen rates were applied to wheat at 0, 30, 60 and 90 lb./acre in one test. In the other test, N was applied to sorghum at 0, 30, 60, and 90 lb/acre (1983) and corn at 0, 40, 80, and 120 1b.facre (1984). The grain sorghum 'Savannah 5' was no-till planted into wheat/clover mulches after wheat grain harvest. Sorghum row width was 24 inches and seeding rate was 6 seed/foot. In 1984, corn 'PA 1502' was no-till planted into reseeded clover stands. Corn row width was 36 inches and seeding rate was 24,000 seed/acre. The experimental design was a randomized complete block, replicated 4 times, with clover seeding rates in whole plots and N rates in split plots. These treatments were designed to determine (1) how much clover could be interseeded with wheat without reducing wheat grain yield, (2) how much, if any, N would the clover provide for wheat, (3) how much N would the various clover rates release to grain sorghum, and (4) how much clover would have to be interseeded with wheat to initiate a clover reseeding system.

Wheat forage yields (Table l), measured when the clover was at full bloom, were significantly reduced only where clover seeding rates reached 15 lb./acre (26 and 36% reduction for 0 and 60 lb./acre applied N,

respectively). Applied N increased forage wheat yields and there was little evidence of N being provided by the clover for wheat growth. Applied N decreased clover forage yields an average of 45%.

Wheat grain yield reductions increased with increasing clover seeding rates. Averaged across N rates, wheat yield reductions were 5, 10, and 31% for 5, 10, and 15 lb./acre clover seeding rates, respectively. The maximum wheat grain yield (65 bu./acre) was achieved with 30 lb./acre N applied to the wheat with no clover treatment.

Although wheat grain yields declined at the high clover seeding rate, grain sorghum yields increased with each clover seeding rate increment. Sorghum yields from the 0 N rate were improved 17, 32, and 48% for clover seeding rates of 5, 10, and 15 lb./acre, respectively (Table 2). Regardless of clover seeding rate, N application generally increased grain sorghum yields. Total clover N production exceeded 100 lb./acre, however, the 1983 growing season was extremely dry and may have limited N release from clover tissue.

In August 1983, reseeding clover had already germinated and by December ground cover ranged from 70 to 90%. The differences in ground cover reflected clover production trends from 1982 rather than initial establishment rates. Dense reseeded clover stands eliminated wheat planting and severe weather limited total clover N production to 45 lb./acre. Clover stands initially established in the fall of 1983 were completely winter killed. Advantages of reseeded rather than planted clover include more fall growth, increased, winter hardiness, and elimination of annual seeding expenses. The results suggest that interseeding clover and wheat is a successful method for establishing a reseeding system. Corn no-till planted this spring will determine if the extra fall growth of reseeded clover will result in sufficient N production to support optimum yields, without the use of N fertilizer.

Table 1. Oven-dry wheat and clover forage yields as affected by rates of interseeded clover and applied N.

	Clover seeding rate (lb./acre) and applied N (kg/ha)							
	0		5		10		15	
Material	0	60	0	60	0	60	0	60
	forage yields, lb/acre							
Wheat	4340	6790	4250	6230	4840	6200	3310	4070
Clover	----	----	540	370	960	530	1960	1010
Total	4340	6790	4790	6600	5790	6320	5280	5080

Table 2. Grain sorghum yields as affected by clover seeded into wheat and sidedress N applied to the sorghum 4 weeks after planting.

Clover seeding rate[1/]	Applied N, lb./acre			
	0	30	60	90
lb./acre	sorghum yield, bu./acre			
0	37	58	56	60
5	43	55	67	70
10	49	62	61	60
15	55	64	59	70
20	59	55	61	63

* * *FLSD (0.10) for any two values is 430

1/ Except for the 20 lb./acre clover seeding rate, the clover was interseeded with 90 lb./acre wheat. The sorghum was planted after harvesting wheat for grain.