WEED CONTROL PROGRAMS FOR NO–TILLAGE SOYBEANS

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Interest among growers in raising two or more crops per year on the same land area (multicropping) is increasing. One of the most successful such production systems in the southeastern United States has been double cropping soybeans after small grain (2). This system is suited to a wide area of the southeast where fall seeded small grains are harvested early enough for soybeans to be planted.

No–tillage planting of the soybeans has contributed to the success of double cropping because it allows establishment of the soybean crop with the least delay. This often results in more favorable soil moisture at planting and allows more time for the soybean crop to mature. Another important advantage in this time of rapidly rising fuel costs is the lower per–acre energy requirement for no–till compared to conventional planting. No–till also requires less labor and decreases soil erosion (1).

Weed Control Programs

In no–till cropping, as with conventional tillage systems, weeds must be controlled to obtain maximum crop yields. When soybeans are planted into the residue of a previously well managed small grain crop, there are some advantages from a weed control standpoint. First, any weeds present are usually small and therefore can be controlled easily with a foliar applied herbicide. Second, the small grain residue will act as a mulch for the soybeans and aid in preventing weed emergence.

Regardless of mulch effectiveness, however, herbicides are essential for weed control in no–till soybeans since cultivation is not possible. A contact–active herbicide will be needed to control any vegetation present at the time of planting while herbicides with residual (preemergence) activity will he needed to prevent further weed infestation. A postemergence treatment may also he required to control escapes from the preemergence application.

Weed control programs for no–till soybeans have been studied at the Agricultural Research Center, Jay, Florida for the past 4 years. The results of these studies indicate that, as in conventional tillage systems, a complete herbicide program is required to control the more troublesome weeds (trade and common herbicide names are listed in Table 1). The results summarized in Table 2 show that neither preemergence treatments nor directed postemergence applications alone provide complete weed control in no–till soybeans. The directed treatments did provide somewhat better control than the preemergence treatments hut control was still less than desired.

The results from a 1979 test (Table 3) again show that preemergence applications were not as effective as desired. However, when a program including both a preemergence and directed postemergence application was used, excellent control of both grass and broadleaf weeds was obtained. Examples of such pro–

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grams include Paraquat + Surflan + Lexone preemergence plus either Lexone + Butyrac, Lorox + Butyrac, or Paraquat directed postemergence. To obtain the beat results the directed postemergence applications should be made to soybeans at least 12 inches tall and to weeds less than 3 inches tall. The spray should not contact more than the lower one-third of the soybean plant. The addition of a surfactant will improve control.

Conclusions

Though the mulch provided by residue from a small grain crop will aid in controlling weeds, herbicides are an essential part of a no-till cropping system. A good herbicide program includes a contact-active material to control any vegetation present at the time of planting in combination with herbicides which provide residual control of both grass and broadleaf weeds. A directed postemergence application may be required in instances where preemergence materials do not provide the desired weed control.

References

1. Gallaher, R. N. 1977. Soil moisture conservation and yield of crops no-till planted in rye. Soil Sci. 41: 145-147.

2. Lewis, W. M., and J. A. Phillips. 1976. Double cropping in the eastern United States. p. 41-50, In M. Stelly (ed.), Multiple cropping. Amer. Sac. of Agron., Madison, WI.

Table 1. List of common and trade names of herbicides described in this paper.

Common name	Trade name
Paraquat	Paraquat
Metribuzin	Sencor or Lexone
Linuron	Lorox
Oryzalin	Surflan
2,4-DB	Butyrac or Butoxone

Table 2. Weed control in no-till soybeans at ARC, Jay, 1976.

Treatment	Rate lbs/A a.i.	When applied[1]	% Control[2] CB	TM
Paraquat + Sencor + X77	.5 + .5 + .25%	PRE + PRE + PRE	69	69
Paraquat + Lasso + Lorox + X77	.5 + 2 + 1 + .25%	PRE + PRE + PRE	54	70
Paraquat + X77 + Sencor + 2,4-DB	.5 + .25% + .38 + .25	PRE + PRE + DP + DP	84	88
Paraquat + X77 + Lorox + Butyrac	.5 + .25% + .5 + .25	PRE + PRE + DP + DP	74	84

[1]PRE = Preemergence in the soybeans; DP = directed postemergence.
[2]CB = Cocklebur; TM = tall morningglory.

Table 3. Weed control programs for no-till soybeans at ARC, Jay, 1979.

Treatment	Rate lbs/A a.i.	When applied[1]	% Weed Control[2] CG	TM	BW
Paraquat + Dual + Lexone + X77	.25 + 1.5 + .5 + .25%	PRE + PRE + PRE + PRE	53	80	83
Paraquat + Lasso + Lexone + X77	.25 + 2 + .5 + .25%	PRE + PRE + PRE + PRE	83	80	73
Paraquat + Surflan + Lexone + X77	.25 + 1 + .5 + .25%	PRE + PRE + PRE + PRE	80	53	90
Paraquat + Surflan + Lexone + X77 + Lexone + Butyrac + x77	.25 + 1 + .5 + .25% + .5 + .25 + .25%	PRE + PRE + PRE + PRE + DP + DP + DP	91	100	100
Paraquat + Surflan + Lexone + X77 + Paraquat + X77	.25 + 1 + .5 + .25% + .25 + .25%	PRE + PRE + PKE + PRE + DP + DP	95	100	100
Paraquat + Surflan + Lexone + X77 + Lorox + Butyrac + X77	.25 + 1 + .5 + .25% + .5 + .25 + .25%	PRE + PRE + PRE + PRE + DP + D? + DP	83	95	98

[1]PRE = Preemergence to the soybeans; DP = directed postemergence.
[2]CG = Crabgrass; TM = tall morningglory; BW = Florida beggarweed.