INTEGRATED MANAGEMENT SYSTEMS FOR THE CONTROL OF ANNUAL MORNINGGLORY IN COTTON

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OBJECTIVES: To identify effective systems for the control of annual morningglory in cotton.

PROCEDURES: Several treatments were applied to field plots at the USDA Cotton Research Station in 1989 and 1990 for the control of annual morningglory in cotton. Herbicides were first applied to planting beds at cotton planting in early April and incorporated with a mulcher operated 5 cm or 10 cm deep in the soil. Rates for these early treatments were 2.0, 2.0, and 1.6 lbs/A, respectively, for cyanazine, methazole, and prometryn. Post emergence and layby treatments were applied as directed sprays to weeds in the drill row at the base of the cotton plants. Post-emergence treatments began soon after the middle of May, whereas the layby treatments were not applied until the end of June. Rates were 1.0 lb/A for cyanazine, 0.5 to 1.5 lbs/A for methazole, and 0.7 to 1.6 lbs/A for prometryn. Although all plots were conventionally cultivated, some were cultivated with special equipment (rods/torsion weeders/spring weeders) to remove small morningglory in the drill row of cotton. When rods were used, plots were cultivated in opposite directions. This cultivation and handweeding were both performed near the end of May. See Table 1 for more information about treatments.

RESULTS: The most successful herbicidal treatment for the control of annual morningglory in cotton was postemergence applications of 1.0 lb/A cyanazine + 2.0 lbs/A MSMA in early June (Table 1). Applications of cyanazine + MSMA to cotton at layby in late June was also helpful in reducing yield losses of cotton. The only other herbicide that provided significant postemergence activity was prometryn. Prometryn incorporated 10 cm deep provided the most consistent control of the soil-incorporated herbicides. But control with this treatment was incomplete based on both visual control ratings and harvested cotton (Table 1). Although the cultivator equipped with rods removed many small morningglory plants in the drill row of cotton, too many survived. Based on the results of the handweeding treatment in late May of 1989 and 1990, the weed-free period for morningglory will probably have to extend at least until the middle of June.

FUTURE PLANS: A manuscript of this two year study is being prepared. A second study will begin on the area of this morningglory nursery in the spring of 1991.

Table 1. Mean visual control ratings for annual morningglory at 1, 3, and 6 months after cotton planting and yields of cotton lint.

Treatment[b]	Control			Cotton
	1 month	3 months	6 months	lint yield
	%			kg ha^{-1}
Cyanazine 10	42 de	61 abc	31 defg	624 bcde
Cyanazine 5	18 efg	42 bcde	22 efgh	541 cde
Cyanazine post	--[c]	82 ab	66 b	1047 ab
Cyanazine layby	--	52 abcde	52 bcd	930 abc
Methazole 10	66 bc	49 abcde	26 efgh	594 cde
Methazole 5	16 fg	19 cde	8 hi	225 e
Methazole post	--	25 cde	18 fghi	414 de
Methazole layby	--	24 cde	13 ghi	448 cde
Prometryn 10	80 ab	82 ab	54 bc	789 abcd
Prometryn 5	48 cd	68 abc	44 cde	678 bcde
Prometryn post	--	54 abcde	50 bcd	827 abcd
Prometryn layby	--	41 bcde	31 defg	639 bcde
Rods + hand	--	64 abc	13 ghi	622 bcde
Rods	--	6 de	10 ghi	290 e
CCT + hand	--	57 abcd	13 ghi	395 de
CCT	0 g	1 e	0 i	261 e
Weed-free	100 a	100 a	94 a	1161 a

[a]Means in columns followed by the same letter do not differ significantly at the 5% probability level according to Duncan's multiple range test.

[b]Treatment code: Cyanazine 10 = cyanazine preplant incorporated 10 cm; Cyanazine 5 = cyanazine preplant incorporated 5 cm; Cyanazine post = cyanazine, MSMA tank mixed, 2 applications postemergent; Cyanazine layby = cyanazine, MSMA tank mixed, 1 application postemergent; Methazole 10 = methazole preplant incorporated 10 cm; Methazole 5 = methazole preplant incorporated 5 cm; Methazole post = methazole, DSMA tank mixed, 3 applications postemergent; Methazole layby = methazole, DSMA tank mixed, 1 application postemergent; Prometryn 10 = prometryn preplant incorporated 10 cm; Prometryn 5 = prometryn preplant incorporated 5 cm; Prometryn post = prometryn, DSMA tank mixed, 1 application postemergent; Rods + hand = conventional cultivation tillage plus rod or spring weeders plus 1 hand weeding; Rods = conventional cultivation tillage plus rod or spring weeders; CCT + hand = conventional cultivation tillage plus 1 hand weeding; CCT = conventional cultivation tillage; Weed-free = conventional cultivation tillage plus rod or spring weeders plus numerous hand weedings.

[c]Treatment not applied at this time.