

5. Trifluralin 3/4 lb/A + Prometryne (Caparol) 2 lb/A.
6. Bensulide 2 lb/A + Prometryne 2 lb/A.
7. Control - no chemicals.

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PREPLANT INCORPORATION OF PLANAVIN AND TRIFLURALIN

H. F. Arle, Research Agronomist, U.S.D.A.
G. D. Christenbury, Assistant Agricultural Engineer

This test was designed to measure the effects of various methods of incorporation of Planavin and Trifluralin on the yield of cotton. The incorporation methods used for both herbicides were: 1) Apply on the flat, and list; 2) Apply on the flat, shallow incorporate, and list; 3) Apply on the flat, deep incorporate and list; and 4) List, apply on the listed beds, and shallow incorporate. There were nine treatments and four replications. There was no significant difference in yield for any of the treatments.

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EFFECTS OF SOIL APPLICATIONS OF HERBICIDES ON FOLLOWING CROPS

K. C. Hamilton, Professor of Agronomy

Larger amounts and more types of herbicides are used in cotton than in any other crop in Arizona. However, the residues of herbicides applied in cotton may persist and affect the following crops. A test was started in 1966 at Mesa to determine how long several commercial herbicides might affect the growth of various crops. The herbicides were applied at rates that might occur as residues if unusual cultural practices reduced microbial breakdown and created soil residues. This type of test also indicated which crops are susceptible to, or tolerant to, soil residues of various herbicides.

Bensulide (Prefar), DCPA (Dacthal), 2,4-D, picloram (Tordon), atrazine (Atrazine), prometryne (Caparol), propazine (Propazine), benefin (Balan), nitralin (Planavin), trifluralin (Treflan), bromacil (Hyvar-X), diuron (Karmex), linuron (Lorox), and monuron (Telvar) at rates indicated in Table I were applied to the soil and incorporated by disking on October 19, 1966. The soil of the test area contained 38% sand, 42% silt, 20% clay and 1% organic matter. Herbicides were applied to plots 12 x 30 feet and treatments were replicated twice.

Immediately after herbicides were applied, eight crops, indicated in Table I, were planted in dry soil on vegetable beds and the field was given a germination irrigation. Crop injury ratings are estimates of stand

reduction and stunting during the first few months after emergence. The area was irrigated to maintain crop growth until February when crops were destroyed by cultivation and the area prepared for planting summer crops. Four crops, indicated in Table 2, were planted in April and grown until late summer when they were destroyed and the area was prepared for the third planting of eight crops. In October, 1967, the area was planted as in 1966 except cantaloupes replaced carrots.

In the first planting, sugar beets were the most sensitive crop to herbicides in the soil; safflower the most resistant. Atrazine, bromacil, and diuron caused the most crop injury; benefin, DCPA, and bensulide, the least. Several crops showed tolerance to certain herbicides, such as; safflower to DCPA, bensulide, benefin, and trifluralin, and carrots to DCPA, propazine, and linuron.

In the second planting, crop injury averaged less than in the first planting. Sorghum was most affected by herbicide residues; cotton, the least affected. 2,4-D did not affect any crop and bromacil was most injurious. Again, residues of most herbicides affected certain crops.

In the third planting, the only crops injured were cantaloupe and lettuce on bromacil-treated plots and alfalfa on diuron-treated plots.

This test and many others have shown that when herbicides are applied as recommended, normal grower practices are followed, and crops grown to maturity, herbicides seldom persist and affect the following crop. If cultural practices interfere with the microbial degradation of a herbicide, injury of the following crop may occur if it is susceptible.

In cotton, several herbicides can be used to control annual weeds. If the crop which follows cotton is not known, a herbicide with a little or no soil residue can be used. If the following crop is known, it may be possible to select a cotton herbicide to which the following crop is resistant.

Table 1. Percent injury to 8 crops planted after soil applications of 14 herbicides at Mesa in the fall of 1966.

Treatment		Percent crop injury								Average for treatment
Herbicide	lb/A	Sugar beets	Alfalfa	Lettuce	Cabbage	Barley	Onions	Carrots	Safflower	
DCPA	8	80	0	25	25	30	15	15	0	24
Bensulide	2	70	15	25	40	5	60	20	0	29
2,4-D	1	20	60	40	40	0	10	65	25	32
Picloram	1	75	100	80	35	45	35	85	50	63
Atrazine	1	100	100	100	100	98	95	100	90	98
Prometryne	1	100	100	95	100	95	75	50	30	81
Propazine	1	100	100	100	95	75	80	15	75	80
Benefin	1	65	5	0	25	40	15	20	0	21
Nitralin	1	90	35	60	55	80	45	35	40	55
Trifluralin	1	75	25	35	10	45	30	30	0	31
Bromacil	1	95	100	100	100	100	100	100	75	96
Diuron	1	90	100	98	98	100	100	85	95	96
Linuron	1	90	100	95	100	90	95	15	30	77
Monuron	1	45	75	35	65	60	40	25	25	46
Average for crop		78	66	64	63	62	57	47	39	

Table 2. Percent injury to 4 crops planted 6 months after soil applications of 14 herbicides at Mesa.

Treatment		Percent crop injury				Average for Treatment
Herbicide	lb/A	Sorghum	Corn	Soybeans	Cotton	
DCPA	8	70	30	0	0	25
Bensulide	2	90	70	0	0	40
2,4-D	1	0	0	0	0	0
Picloram	1	75	20	100	95	72
Atrazine	1	10	35	95	70	52
Prometryne	1	15	10	40	0	16
Propazine	1	10	35	95	50	47
Benefin	1	75	50	10	0	34
Nitralin	1	80	70	0	25	44
Trifluralin	1	95	60	0	0	39
Bromacil	1	95	95	100	95	96
Diuron	1	60	70	50	0	45
Linuron	1	10	20	20	5	14
Monuron	1	10	0	5	0	4
Average for crop		50	40	37	24	

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