Mimeographed Circular M-264 October, 1954

CHEMICAL CONTROL OF CRAB GRASS IN STRAWBERRY PLANTINGS

By W. R. Kays

and Darvin Keck

Department of Horticulture

Agricultural Experiment Station
DIVISION OF AGRICULTURE
Oklahoma A. & M. College
Stillwater

Chemical Control of Crab Grass in Strawberry Plantings

W. R. Kays and Darvin Keck*

Strawberries are one of the most profitable fruit crops grown in Oklahoma. With proper care and control of grasses and weeds, successful production can be attained one year after planting. One of the greatest problems in obtaining production is the maintenance of grass- and weed-free plantings.

Crab grass is one of the most serious grass problems in cultivated fields in the entire Southwest. This pest competes with strawberries for moisture and nutrients. It is extremely serious during hot, dry summers, resulting in a reduction in plant stands which may bring about a sizable decrease in yield the next year.

Reported here are results of one year's work on the control of crab grass in a strawberry planting. Preliminary trials were begun by growing both crab grass and strawberries in flats in the greenhouse. Applications of various herbicides of differing concentrations were used to determine what could be used effectively to control crab grass and to test for chemicals which would not seriously affect strawberry plants. After screening in the greenhouse, field tests followed and a report of the results of these experiments is included herein.

What Other Studies Have Shown

Results of other studies show that:

1. There should be an average of at least four and up to as many as seven plants per square foot of row space. A reduction in the number of plants per square foot results in a decrease of marketable fruit the following year.[1]

2. The time of runner-plant formation and root development the first year is extremely important to the productive capacity of plants the following year.[3]

3. Two of the most important factors in the economics of strawberry production are the expense of weeding and the problem of obtaining suitable hand labor to do the job.[3]

---

*Formerly graduate assistant.

4. It is possible to obtain as much as an 88 percent reduction in the total weeding necessary and hand labor required for strawberries when chemical weed killers are used.[2]

Procedure

Forty plots of Blakemore strawberries were set in the field in February, 1952. These plants were in a block 10 plots wide and 4 plots long. Each plot contained 15 plants set in rows 3 feet apart with plants 3 feet apart in the row. Alley-ways were left between each series of plots so that herbicide applications could be made without over-lapping chemicals.

The particular block selected was on a uniform, loamy type soil. It varied from level to a slight slope to the east and was very heavily infested with crab grass seed.

All blossoms were removed from the strawberry plants the first spring, as they appeared, in order to hasten plant growth. All plots were kept cultivated and hoed until May 6, so that no weeds would be present on that date. Approximately one inch of water was applied on May 6, by means of an over-head sprinkler, so that moisture conditions would be ideal for crab grass seed germination. Strawberries were also irrigated at other times throughout summer and fall as was needed.

On May 8, the following materials were applied, each to four replicated blocks:*

EH 1 (Sodium 2, 4-Dichloro-phenoxyethyl sulfate) at eight pounds per acre.

EH 1 at 10 pounds per acre.

CMU (3-, p-chlorophenyl, -1-1- dimethylurea) at 1/4 pound per acre.

2, 4-D (2, 4-Dichlorophenoxy-acetic acid) at 1 1/2 pounds per acre.

2, 4-D at 2 pounds per acre.

CIPC (O-isopropyl N, 3-chlorophenyl, carbamate) at 10 pints per acre.

S-2500 (silica floride compound) at 75 pounds per acre.

---

*Quantities are given in amount of active ingredient.

S-2500 at 100 pounds per acre.

Mulch (castor bean hulls) approximately 1 inch deep.

Control plots.

Most of the plants were vigorously growing at time of first treatment with several plants having from one to four runner-plants each. A strip two feet wide was sprayed the entire length of each plot. The middles were cultivated on May 13, leaving a strip approximately 18 inches wide in the row undisturbed.

On May 22, a small wooden frame, 1 foot wide and 3 feet long, was centered over the third, eighth, and thirteenth plants in each of the plots, and all crab grass seedlings in the nine square feet were counted in each plot. Results are summarized in Table I.

Photographs were taken on June 16 to show a comparison of crab grass stands in plots with different treatment. See Figure 1. Other photographs were taken on October 20 to show stands of strawberries under each treatment. See Figure 2.

All plots were hoed on June 18 and were kept relatively free of weeds and grasses the remainder of the season. On July 9, a second application of chemicals was made that corresponded to those made on May 8, except that no effort was made to maintain the mulch at that time. All runner plants were counted on June 19, and all rooted runner-plants were counted on September 14 and 15, and again in December. Results are summarized in Table I.

Results

Some of the chemicals applied during the spring and summer season of the first year did materially reduce crab grass stands and did not seriously affect strawberry plant growth of fruit yield the following year. See Table I. Three treatments gave results as good or better than the check plot as far as total yield is concerned. The three treatments were:

2, 4-D at 1 1/2 pounds per acre.

EH-1 at 10 pounds per acre.

A castor bean hull mulch (1 inch deep).

Each of these treatments have advantages and disadvantages. Sixty-five percent control was obtained with 2, 4-D when applied at 1 1/2 pounds per acre, and yields on these plots were good. Also, 2, 4-D controlled broad leaf plants. However, caution must be exercised when using 2, 4-D to avoid killing tomatoes, cotton, grapes, and other crops which may be growing nearby. EH-1 gave 80 percent control of crab grass on June 19, but cost is high and may be prohibitive to the average grower.

Mulch gave good control (72 percent), and yields were high, 58 quarts per 180 feet of row (equal to 4, 678 quarts per acre). It works very well for small planting, but it is sometimes hard to obtain enough mulch for large plantings.

LITERATURE CITED

1. Cooper, J. R. and J. E. Vaile. Effect of fertilizers, soil reaction and texture, and plant stand on the performance of strawberries. Ark. Ag. Ex. Sta. Bul. 454: 34-6. 1945.

2. Denisen, E. L., Controlling weeds in strawberries with Sodium 2, 4-Dichlorophenoxyethyl Sulfate. Proc. Amer. Soc. Hort. Sci. Vol. 61:185-194. 1953.

3. Shoemaker, J. S. The Strawberry. Ohio Bul. 444: 27. 1929.

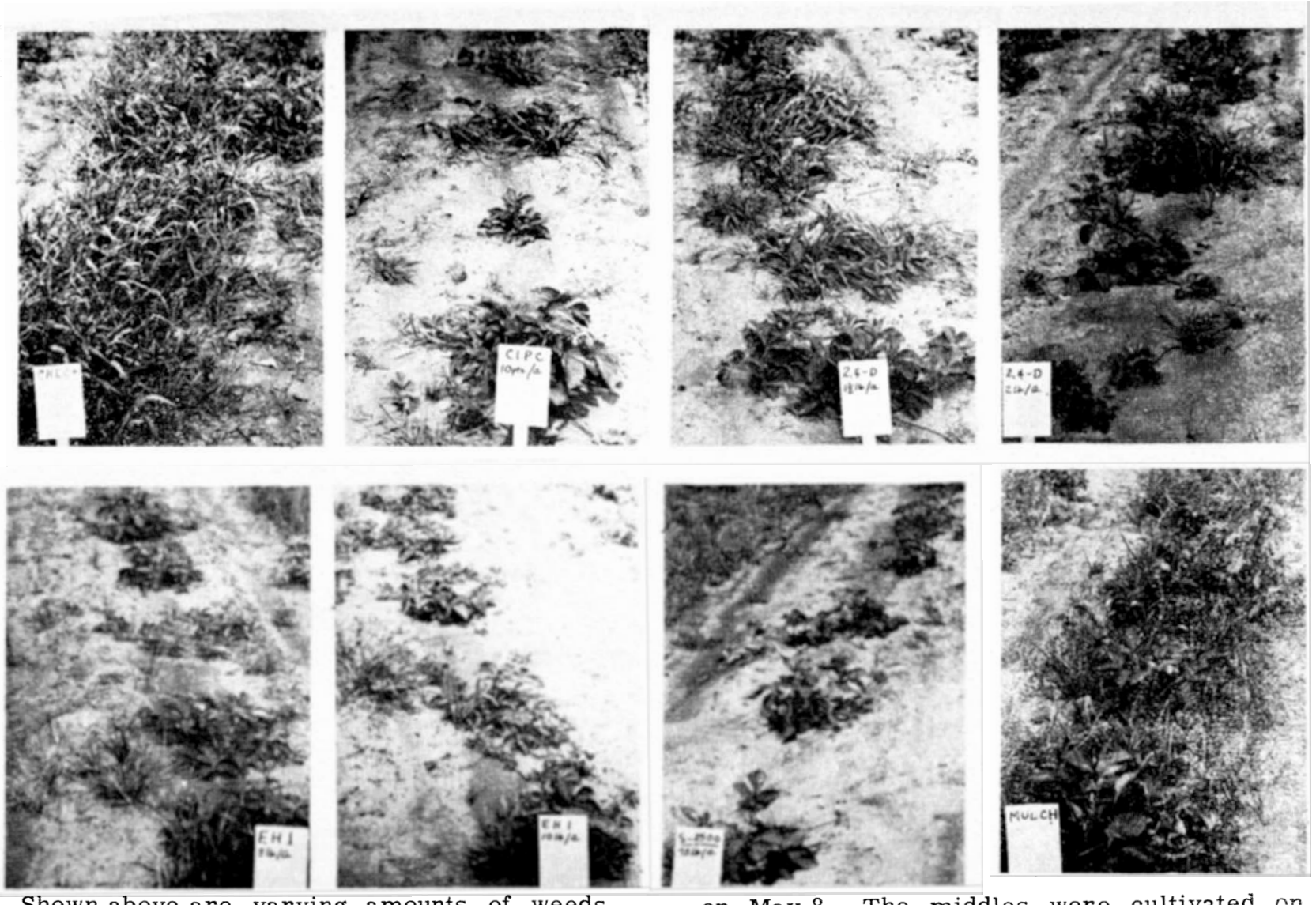
Table 1. --The Effect of Certain Treatments on Runner Plant Development, Yield and Fruit Size of Blakemore Strawberries and on Crab Grass Control.

Treatment	1952					1953	
	Percent Control of Crab Grass in June	No. of Rooted Runner Plants June 19	Sept. 15	Dec. 12	Average Number Per Ft. of Row	Average Number of Berries Per Pound Second Harvest	Total Fruit Yield in Quarts*
E.H. 1** 8 lbs/A	72.1	453	1768	2090	11.0	115	40.0
E.H. 1 10 lbs/A	80.2	427	1858	2181	12.1	123	50.8
2,4-D 1 1/2 lbs/A	65.3	391	1711	1953	10.9	109	50.4
2,4-D 2 lbs/A	61.1	381	1812	2045	11.4	113.5	42.8
Mulch***	72.1	508	2654	3006	16.7	113.5	58.0
Check	0	376	2072	2396	13.3	121.2	50.2
CMU 1/4	3.0	266	1391	1615	9.0	108.7	31.7
CIPC-10 pts/A	74.7	328	970	1183	6.6	122.5	36.1
S2500 - 75 lbs/A	80.2	368	1414	1760	9.8	108.2	45.4
S2500 - 100 lbs/A	45.0	400	722	885	4.9	106.5	29.0

*Yield is for 180 feet of row (equal to 4,678 quarts per acre).

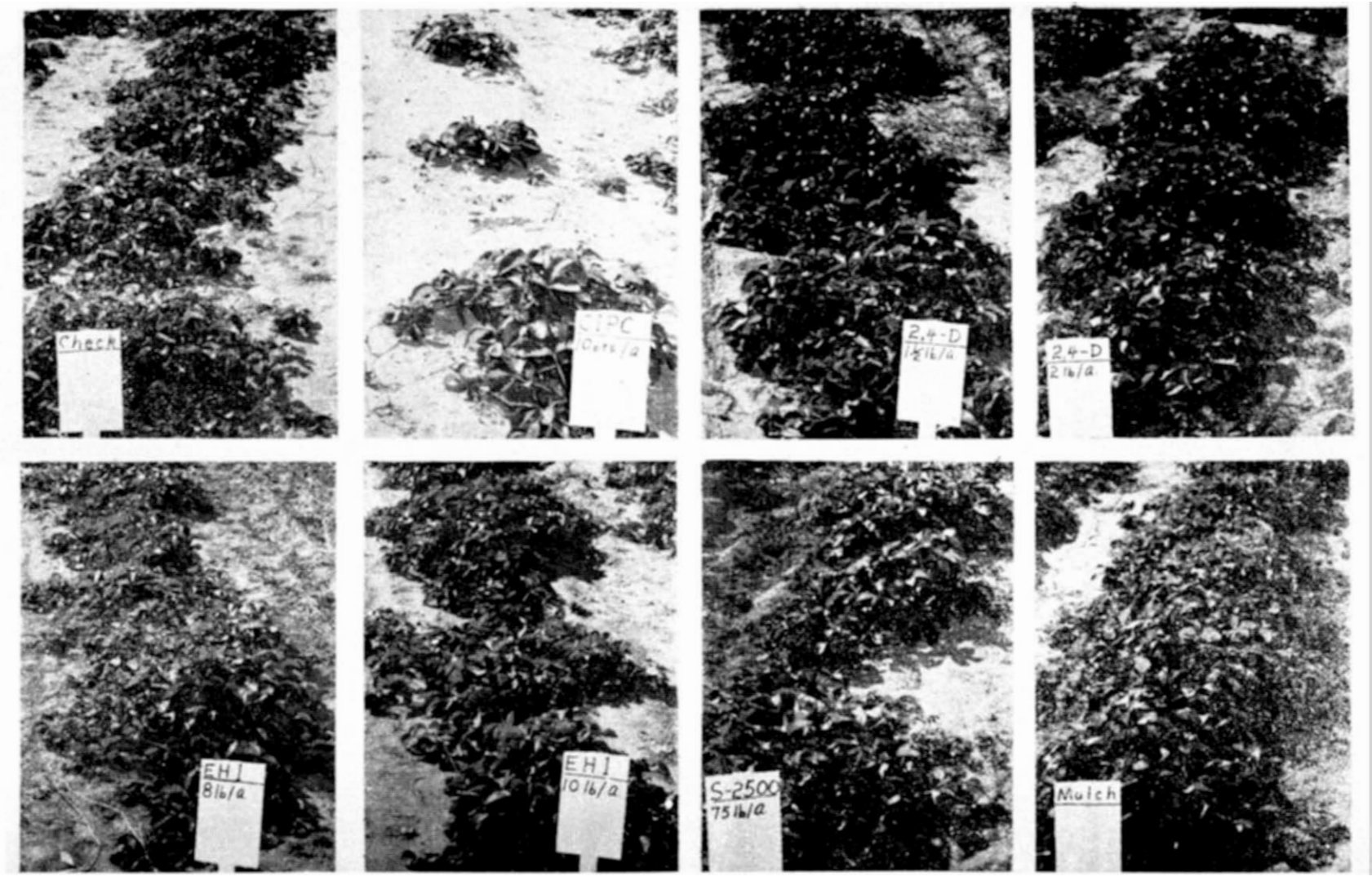
**Formerly known as Crag Herbicide 1. Now officially designated as SES.

***Approximately one inch of castor bean hulls.



Shown above are varying amounts of weeds and grass in plots with different chemical treatment. Photographs were taken on June 16, after chemicals had been applied on May 8. The middles were cultivated on May 13, leaving a strip approximately 18 inches wide in the row undisturbed. Percent control with each treatment is given in Table I.

Figure 1.



These photographs, taken October 16, are of the same plots shown on the preceding page. They show the effects of different chemical treatments on runner plant formation. Notice how some treatments seriously retarded plant growth. Obviously, the value of any treatment is dependent upon its ability to control crab grass without harming plants.

Figure 2.