Use of Flaming, Herbicides in
COTTON WEED CONTROL

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Flame cultivation for control of annual weeds in cotton reached its peak about 1955. At this time a new herbicide, monuron, was found effective as a layby application for weed control in cotton.

In 1957 a field-scale test was started on the Marana Experiment Farm to compare flame cultivation and layby application of monuron as supplements to mechanical cultivation and to evaluate long-term results of various weed control programs.

In this field-scale test, plots were large, about three-quarters of an acre each, to yield at least one bale of Acala cotton on first picking. The four treatments, replicated six times, were:

A. Regular mechanical cultivation as needed from May to July
B. Mechanical cultivation plus flame cultivation in June and July
C. Mechanical cultivation plus monuron at layby
D. Mechanical cultivation plus flame cultivation plus monuron at layby

The test area was heavily infested with morningglory, carelessweed and seedling Johnsongrass. Early in the season all plots were cultivated with sweeps and disks. Normal hoeing and thinning was also used.

In Single Operation

When the cotton was eight inches high the flame cultivator was mounted on the tractor with the cultivator, and the flame plots were cultivated and flamed in a single operation. For the early flamings the tractor was operated at three miles per hour, and the gas pressure at the burners was 30 pounds per square inch. After the cotton was larger the ground speed was slowed down, and the operating pressure on the burners was increased to 40 pounds. The burners were directed across the drill-row, two burners per row in a staggered pattern.

Monuron was applied to the soil at the rate of 1 to 1 1/2 pounds per acre when the cotton was 18 to 24 inches tall. The last mechanical cultivation was omitted on the plots receiving the layby chemical.

The cotton was harvested mechanically after either frost or complete chemical defoliation. Since each plot yielded a bale or more, it was possible to gin each separately and obtain yield, lint percentage, grade and staple. Estimates of weed control were made at harvest.

Repeated, Weather Permitting

Insofar as possible the same treatments were applied to the same plots each year. Due to variations in growing conditions it was not possible to exactly duplicate the treatments each year. In some years summer rains prevented mechanical cultivation after mid-July.

Table 1 shows the lint yield by treatments and year. The highest lint yields were obtained when mechanical cultivation was supplemented with flame and herbicide or herbicide alone. Mechanical cultivation alone had the lowest yield.

Table 2 contains the four-year average lint percentage and grade index. There was little difference in lint percentage or grade, although mechanical cultivation plus flame and herbicide had the best averages. Fiber length was unaffected by weed control method.

FOUR-ROW FLAME cultivator used in these tests is shown below. Burners are the flat "U.S.D.A. burners."

Weed Growth Reduced

During this test there was a noticeable reduction in weed growth on all plots, even those receiving only mechanical cultivation, because of the intense cultivation. At the end of the test many of the plots were nearly free of established weeds, especially those receiving herbicide or herbicide plus flame.

Many advantages for flame cultivation were apparent in this test. Flame cultivation was effective in controlling weed seedlings in the drill row from the first irrigation until layby, when weather permitted repeated flamings.

The use of flame is not expensive; it costs about one dollar per acre per application. The flame cultivator can be used in conjunction with the regular cultivator. Flame cultivation can be used on sandy soils and in small cotton where monuron applications have not proven safe. It can also be used on fields having considerable variation in soil type.

There Are Problems, Too

Many problems in the use of flame cultivation in cotton were also apparent in this test. The flamer destroyed many of the lower leaves and squares. Flaming had to be properly timed, for it did not control established annual weeds. It was not effective in controlling perennial weeds. The mechanical cultivator preceding the flamer created a cloddy surface and the clods protected many of the small weeds from the flame.

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Table 1.—A Comparison of Cotton Yields When Using Flame Cultivation and a Layby Herbicide as Supplements to Mechanical Cultivation.

<table>
<thead>
<tr>
<th>Method of Weed Control</th>
<th>1957</th>
<th>1958</th>
<th>1959</th>
<th>1960</th>
<th>Average</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mechanical Cultivation</td>
<td>620</td>
<td>714</td>
<td>608</td>
<td>562</td>
<td>626</td>
</tr>
<tr>
<td>Mechanical plus Flame</td>
<td>609</td>
<td>702</td>
<td>671</td>
<td>605</td>
<td>648</td>
</tr>
<tr>
<td>Mechanical plus Monuron</td>
<td>639</td>
<td>723</td>
<td>656</td>
<td>607</td>
<td>656</td>
</tr>
<tr>
<td>Mechanical plus Flame and Monuron</td>
<td>614</td>
<td>706</td>
<td>692</td>
<td>623</td>
<td>659</td>
</tr>
</tbody>
</table>

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If the burners were front-mounted on the tractor it would be more effective in controlling weeds, but would be more uncomfortable for the operator and would probably cause overheating of the tractor engine. A major drawback to the flame cultivator is that it cannot be used during rainy periods and after layby.

As with most farm practices, the choice between flame cultivation and herbicides to supplement mechanical cultivation depends upon local circumstances and the judgment of the grower.

Eight Pima County Poultrymen Honored

Eight Pima County poultrymen were awarded special metal signs for posting on their ranches at the winter banquet of the Southern Arizona Poultry Association. The awards were made by the Pima County Farm Bureau at The University of Arizona student union building.

Here, Mel Petersen (left), president of the Pima County Farm Bureau, is shown making the presentations to:

(Left to right): Bob Condit, Wes McCartney, Dick Gruendyke (with poultry sign), George Crickman (back of Gruendyke), Marvin Williams, Fred Zenz, T. C. Abbott, and Irven Gee. All of the men are from Tucson, except Crickman, who is from Rillito.

To win the award the poultrymen had their farms and ranches inspected in June and then at the end of November to check on improvement in cleanliness, sanitation, appearance of buildings and grounds, landscaping, and absence of flies and odors, according to Dr. Frank Rollins, University of Arizona Extension poultry specialist.

Agriculture is the nation's biggest industry. Farming employs 7 million workers—more than the combined employment in transportation, public utilities, the steel industry, and the automobile industry. Agriculture's assets total $207 billion, equal to: Nearly three-fourths of the value of current assets of all corporations in the United States, or nearly two-thirds of the market value of all corporation stocks on the New York Stock Exchange. The value of agriculture's production assets represents around $23,000 for each farm employee.

In 1900 we used 37 per cent of our national labor force in agriculture. In 1960 a tremendously increased agricultural production used only 8.6 per cent of the labor force.

Dr. F. G. Werner, Department of Entomology, is chief investigator in a study, "Systematic Studies of New World Anthicidae," which has received a grant of $11,000 from the National Science Foundation.

Studies in this college of "Parathyroid Activity Under Variant Conditions" in dairy cattle have been helped by a $15,145 grant from the U. S. Department of Health, Education and Welfare. Dr. G. H. Stott is doing this work.

Dr. Mel Schonhorst's alfalfa investigations are helped by a grant of $350 from Bruce Church Ranch, Inc., at Yuma.