Johnsongrass is the most important perennial weed in Arizona's irrigated crops. Although Johnsongrass grows from seed or rhizomes, plants from rhizomes are more competitive and more difficult to control. This report is mainly on the control of established Johnsongrass.

Response of Johnsongrass to Herbicides

By K. C. Hamilton

In the past, crop competition and rotation, with repeated cultivation and hoeing, have been used to control established Johnsongrass. For severe infestations, summer fallows with repeated cultivation have been included in the rotation. Cultural and mechanical controls have sometimes been supplemented with chemical controls. During the past few years, introduction of new herbicides has increased interest in, and use of, chemical control of Johnsongrass in irrigated areas.

A Long Time Study

Research on Johnsongrass and its control has been a continuing program at The University of Arizona. Johnsongrass plants collected throughout Arizona in 1960 have been maintained vegetatively at Tucson. In 1964, 216 spaced plants of each of three strains were established from rhizomes obtained from the original selections. They were allowed to grow until they averaged 70 stems per plant. Flowers were removed to prevent seed production. The plants were irrigated every two to four weeks during the growing season. These plants were used to study the response of Johnsongrass strains to repeated applications of several herbicides.

Treatments started in the fall of 1964 or spring of 1965. Herbicides tested included cacodylic acid, dalapon, dalapon-TCA, DSMA, and paraquat. Herbicides were applied as directed sprays from a single nozzle with 200 to 600 gallons of solution per acre needed to wet the foliage. Regrowth was treated every two to four weeks.

Mortality Count Made

In the spring of 1966, the number of plants surviving various treatments was counted. Herbicide concentrations, number of treatments, Johnsongrass survival, and herbicide cost for certain treatments are summarized in Table 1. Kill of the three strains of Johnsongrass was obtained with six applications of DSMA or 12 applications of paraquat when treatment started in the fall.

Treatments started in the fall were more effective than similar treatments started in the spring. Dalapon and dalapon-TCA treatments started in the fall killed 92 percent of the plants but killed only 53 percent when started in the following spring. The dalapon-TCA combination was no more effective than dalapon alone.

Paraquat and cacodylic acid produced a rapid toptkill similar to weed oils. Twelve applications of paraquat at two-week intervals killed all Johnsongrass but 12 applications of cacodylic acid killed only 61 percent.

DSMA Most Economical

When costs of herbicides used were determined, based on 1965 prices, DSMA was the most economical treatment. In two other tests in 1965 DSMA gave 100 percent control of established Johnsongrass at similar costs.

The three strains of Johnsongrass differed in their susceptibility to herbicides. These strains were selected for this test because they differed in susceptibility to dalapon in previous tests. The numbers of plants of each strain surviving certain treatments are (Continued on Next Page)

Table 1. Johnsongrass Survival and Herbicide Cost of Repeated Treatments.

<table>
<thead>
<tr>
<th>Treatment Started</th>
<th>Herbicide</th>
<th>Number of treatments</th>
<th>Plants* alive 1966</th>
<th>Cost per acre for herbicide</th>
</tr>
</thead>
<tbody>
<tr>
<td>1964</td>
<td>paraquat ½%</td>
<td>12</td>
<td>0</td>
<td>$320.00</td>
</tr>
<tr>
<td>1964</td>
<td>DSMA 10 lb./100 gal.</td>
<td>6</td>
<td>0</td>
<td>63.00</td>
</tr>
<tr>
<td>1964</td>
<td>dalapon 10 &amp; TCA 5 lb./100 gal.</td>
<td>9</td>
<td>5</td>
<td>150.00</td>
</tr>
<tr>
<td>1964</td>
<td>dalapon 10 lb./100 gal.</td>
<td>9</td>
<td>7</td>
<td>142.00</td>
</tr>
<tr>
<td>1965</td>
<td>dalapon 10 &amp; TCA 5 lb./100 gal.</td>
<td>8</td>
<td>7</td>
<td>238.00</td>
</tr>
<tr>
<td>1965</td>
<td>dalapon 10 lb./100 gal.</td>
<td>8</td>
<td>7</td>
<td>227.00</td>
</tr>
<tr>
<td>1965</td>
<td>cacodylic acid 2%</td>
<td>12</td>
<td>28</td>
<td>570.00</td>
</tr>
</tbody>
</table>

* Based on 72 plants.

Table 2. Survival of Three Johnsongrass Strains After Repeated Applications of Herbicides.

<table>
<thead>
<tr>
<th>Treatment Started</th>
<th>Herbicide</th>
<th>Number* of plants surviving repeated treatments</th>
</tr>
</thead>
<tbody>
<tr>
<td>1964</td>
<td>paraquat ½%</td>
<td>E8 0 0 0</td>
</tr>
<tr>
<td>1964</td>
<td>DSMA 10 lb./100 gal.</td>
<td>W11 0 0 0</td>
</tr>
<tr>
<td>1964</td>
<td>dalapon 10 &amp; TCA 5 lb./100 gal.</td>
<td>0 0 0</td>
</tr>
<tr>
<td>1964</td>
<td>dalapon 10 lb./100 gal.</td>
<td>5 0 0</td>
</tr>
<tr>
<td>1965</td>
<td>dalapon 10 &amp; TCA 5 lb./100 gal.</td>
<td>7 0 0</td>
</tr>
<tr>
<td>1965</td>
<td>dalapon 10 lb./100 gal.</td>
<td>22 3 2</td>
</tr>
<tr>
<td>1965</td>
<td>cacodylic acid 2%</td>
<td>17 15 3</td>
</tr>
</tbody>
</table>

* Based on 24 plants.
Endocrine Factors Affecting Feedlot Performance of Heifers

By D. E. Ray

Nutritional experiments at land grant universities have contributed significantly to the efficiency of commercial cattle feeding operations. The importance of the proper balance between the various nutrients and micronutrients has thus been brought into focus, with resulting practical application to feedlot operations.

Most beef animals fed and slaughtered are steers. This is due to the simple fact that there are many more males surplus to a breeding herd than females — polygamy is the rule! Since this is the case, most research has been concerned with efficiency of growth and finishing of steers, and justly so.

The Forgotten Bovine

Yet there is a large portion of beef derived from the other sex. For example, approximately 39 percent as many heifers as steers were slaughtered in 1965. There has been a tendency to neglect the heifer in feedlot research.

Many feeders actually prefer not to

(Continued from Previous Page)

shown in Table 2. Strain E8 was relatively resistant to herbicides but was killed by the most effective treatments. Strains W11 and W21 were more susceptible to all treatments.

Repeated applications of all herbicide treatments in this test were required to kill any of the strains. A minimum of five applications was needed to kill the most susceptible strain with the most effective treatment.

Control Effort Inefficient

When herbicides have been applied to Johnsongrass under field conditions, the control has often been poor. Failures should not be blamed on resistant Johnsongrass. Poor control is usually caused by misapplication, insufficient herbicide applied, too long a time between applications, and not enough applications.

Survival of the Toughest

When a Johnsongrass control program is not successful, the more susceptible strains may be destroyed, leaving the more resistant strains. An inadequate control effort may alter the Johnsongrass infestation, resulting in a highly resistant population the following year that is more difficult to control than the original.

In most crops, repeated applications of herbicides for Johnsongrass control are not recommended or possible. Where cropland is fallow because of weeds or crop-acreage restrictions, it may be possible to use repeated applications of herbicides to control established Johnsongrass. Such applications would be most useful in desert valleys (such as the Sulphur Springs) where summer rainfall may make mechanical cultivation impossible.

In most areas, repeated applications of the best herbicide would be faster than — and economically competitive with — mechanical fallow for control of established Johnsongrass. Where both annual weeds and established Johnsongrass must be controlled, a combination of mechanical and chemical controls would be most effective.

is designed to evaluate the effect of various hormones on growth.

The initial experiment will involve three "sexes": intact heifers, spayed heifers, and steers — with 32 animals in each group. One half of each "sex" group will receive a hormone in the feed. The other half will serve as controls. The inclusion of steers will serve as a baseline from which to evaluate performance of the heifers.

Rate of gain and feed conversion will be evaluated during the feeding trial. At the end of the finishing period, all cattle will be slaughtered and their carcasses evaluated for quality of meat and proportion of edible cuts.

Thus, information will be obtained on two important aspects of cattle production — efficiency of feedlot performance and carcass desirability.

Why Spayed Heifers?

The question may arise as to why spayed heifers are being studied. There are several reasons for this. First, the removal of the ovaries eliminates the major source of two hormones normally secreted by these organs. This will allow an evaluation of the importance of these natural hormones on growth and carcass traits.

Secondly, the response of an animal to an "outside" hormone can be very dependent on the hormones its own body is producing. The spayed heifer may react quite differently from the "normal" heifer when treated with a hormone. Most of the feeding comparisons involving spayed heifers were conducted 20 to 30 years ago. It will be worthwhile to evaluate performance of spayed heifers with modern animal nutrition techniques. Finally, spaying accomplishes two more functions — it eliminates heat periods and eliminates pregnant heifers!

A progress report will be made at the termination of the initial trial.

If you’ve already filled out and returned the green postal card, giving your name, address AND ZIP CODE NUMBER, we thank you very much. If you have not done so yet, we urge you to do so now. After the cut-off date, all addresses without the zip code number will be dropped from our mailing list.

September-October