ESTABLISHMENT OF ARROWLEAF CLOVER
(TRIFOLIUM VESICULOSUM, SAVI) ON
PENSACOLA BAHIAGRASS SOD

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SUMMARY

"Yuchi" arrowleaf clover was seeded on a Pensacola bahiagrass sod by
several methods. Burning of grass residue before seeding resulted in
higher clover yields early in the season, and in some cases, the effect
lasted throughout the clover growing season.

INTRODUCTION

There has been increased interest in the use of legumes in forage
programs during the last decade. More recently, the energy situation has
further heightened such interest. Some of the advantages of legumes in
forage programs are: (1) Extend grazing season, (2) Better utilization of
resources when overseeded on perennial grasses, (3) Increased forage production
and more favorable distribution of forage, (4) Higher quality forage,
(5) Increased animal performance, (6) Lower N requirement by fixing atmos-
pheric nitrogen for its own growth and (7) Residual N for later crops.

Arrowleaf clover (Trifolium vesiculosum, Savi) is well-adapted as a
forage crop to most of the Southeastern U.S., including North Florida. The
main production period of this legume is from March through May – the time
when bahiagrass produces very little forage. One of the problems in producing
arrowleaf clover on bahiagrass sod has been the difficulty in establishing
a stand in the sod.

OBJECTIVE

The objective of the experiments reported here was to compare the
effectiveness of different methods of establishing arrowleaf clover on
Pensacola Bahiagrass sod.

PROCEDURE

The experiments were conducted at AREC, Quincy on a "mature" 6-year
old sod of Pensacola Bahiagrass. The sod was limed and fertilized for
optimum clover growth as indicated by soil test results.

Experiment 1. This experiment was set up as a split plot. Whole plots
were (1) mow to a height of 2 inches and remove forage prior to seeding to
simulate grazing and (2) paraquat broadcast sprayed at 1 pint per acre and
burn 5 days later prior to seeding. Split plot treatments applied to each
of the whole plots were:

   (1) Unseeded check
   (2) Seeded check
   (3) Paraquat at 1 pint per acre at seeding
   (4) Dalapon at 3 pounds per acre at seeding
   (5) Paraquat at 1 pt/A plus Dalapon at 3 lb/A at seeding
   (6) Roundup at 1 pound per acre in a 7 inch band at seeding

"Yuchi" arrowleaf clover was seeded with Midland Zip Seeder at 8 pounds per acre. Whole plot (2) (Paraquat) was sprayed on 10/15/76 and burned on 10/20/76. Whole plot (1) was mowed on 10/21/76. All plots were seeded on 10/22/76 with spray treatments applied at planting.

Experiment 2. This experiment was set up as randomized complete block with the following treatments:

   (1) Unseeded check
   (2) Mow to 2 inch stubble, broadcast clover
   (3) Mow, broadcast clover, disk
   (4) Mow, seed clover with sod seeder
   (5) Paraquat at 1 pt/A, burn, broadcast clover
   (6) Paraquat at 1 pt/A, burn, broadcast clover, disk
   (7) Paraquat at 1 pt/A, burn, seed with sod seeder
   (8) Mow, disk, seed with sod seeder
   (9) Paraquat at 1 pt/A, burn, disk, seed with sod seeder
   (10) Burn after frost, broadcast clover, disk - (Frost occurred on 11/6/76)

Plots which were sprayed with Paraquat were sprayed on 11/2/76 and burned on 11/5/76. All plots were planted on 11/9/76 with a modified Massey-Ferguson seeder. Plots which were disked were disked lightly with the disks set nearly straight.

Forage yields from both experiments were cut with a flail type plot harvester set to mow to a 3 inch stubble height.

RESULTS AND DISCUSSION

Table 1 shows relative forage yields of Arrowleaf clover from experiment 1 at first harvest on 3/22/77. The whole plot which was mowed prior to seeding is assigned a relative value of 100. The average yield increase from the whole plot which was treated with Paraquat and burned prior to planting was nearly three-fold (rel-yield of 291). Yield increases from individual sub-plot treatments ranged from about two-fold to over four-fold. Neither Dalapon nor Roundup gave any further advantage over the use of Paraquat followed by burning before seeding. At the second harvest on 5/2/77, these differences had disappeared and yield were similar for all treatments. The importance is the yield increases obtained early in the season when forage is limiting.

Table 2 shows relative forage yields from experiment 2 at 2 harvest dates. Note that treatments 5, 6, 7, 9, and 10 had much higher forage yields
TABLE 1. RELATIVE FORAGE YIELDS OF ARROWLEAF CLOVER ON PENSACOLA BAHIA-GRASS SOD (Harvested 3/22/77)

<table>
<thead>
<tr>
<th>Treatment at seeding (split plot)</th>
<th>Trt. prior to seeding (whole plot)</th>
<th>Mowed</th>
<th>Paraquat + Burn</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Unseeded check</td>
<td>Relative Yield</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2. Seeded check (broadcast on top)</td>
<td>100</td>
<td>382</td>
<td></td>
</tr>
<tr>
<td>3. Paraquat at seeding</td>
<td>100</td>
<td>425</td>
<td></td>
</tr>
<tr>
<td>4. Dalapon at seeding</td>
<td>100</td>
<td>202</td>
<td></td>
</tr>
<tr>
<td>5. Paraquat + Dalapon at seeding</td>
<td>100</td>
<td>265</td>
<td></td>
</tr>
<tr>
<td>6. Roundup at seeding</td>
<td>100</td>
<td>231</td>
<td></td>
</tr>
<tr>
<td>Average</td>
<td>100</td>
<td>291</td>
<td></td>
</tr>
</tbody>
</table>

TABLE 2. RELATIVE FORAGE YIELDS OF ARROWLEAF CLOVER ON PENSACOLA BAHIA-GRASS SOD

<table>
<thead>
<tr>
<th>Treatment</th>
<th>Relative forage yield 3/22/77</th>
<th>5/2/77</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Unseeded check</td>
<td>---</td>
<td>---</td>
</tr>
<tr>
<td>2. Mow, broadcast seed</td>
<td>166</td>
<td>100</td>
</tr>
<tr>
<td>3. Mow, broadcast seed, disk</td>
<td>140</td>
<td>108</td>
</tr>
<tr>
<td>4. Mow, seed with sod seeder</td>
<td>100</td>
<td>112</td>
</tr>
<tr>
<td>5. Paraquat, burn, broadcast clover</td>
<td>249</td>
<td>181</td>
</tr>
<tr>
<td>6. Paraquat, burn, boroadcast clover, disk</td>
<td>254</td>
<td>106</td>
</tr>
<tr>
<td>7. Paraquat, burn, seed with sod seeder</td>
<td>263</td>
<td>145</td>
</tr>
<tr>
<td>8. Mow, disk, seed with sod seeder</td>
<td>146</td>
<td>127</td>
</tr>
<tr>
<td>9. Paraquat, burn, disk, sod seeder</td>
<td>280</td>
<td>161</td>
</tr>
<tr>
<td>10. Burn after frost, broadcast, disk</td>
<td>261</td>
<td>136</td>
</tr>
</tbody>
</table>

than other treatments at the first harvest. The common factor in these treatments was that they were burned prior to seeding. Burning of any residue present allows the clover seed to reach the soil, whereas if the residue is left, seeds may get caught up and never reach the soil surface. There may be other beneficial effects of burning excess residue before seeding clover. At the second harvest (5/2/77) the treatments with the highest forage production were still the treatments that had been burned before seeding.

From these experiments, it is evident that burning grass residue aids in establishing arrowleaf clover on bahia sods and can result in higher forage production in the early part of the growth period. This experimental area had not been grazed, but was managed for hay prior to fall clover seeding. The sod was very dense below the cutter bar level (about 3 inches). In a grazing situation, if the bahia sod were grazed very closely—as close as cattle could be forced to graze—broadcasting the clover followed by a light disking may result in satisfactory clover stands. However, if considerable grass residue is present, it would be beneficial to burn before seeding, whether the grass is desiccated by frost or from Paraquat.