Regrowing Bermudagrass Following Jackrabbit Damage

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Introduction

Both jackrabbits (Lepus spp.) and cottontail rabbits (Sylvilagus spp.) are commonly found throughout the Southern High Plains of Texas. Jackrabbit is a true hare having longer ears than the cottontail rabbit. Jackrabbits’ preferred habitat is overgrazed or cultivated fields, and they can consume 0.23 to 0.45 kg of green vegetation per day. Summer food sources consist of 70% forbs, 19% grasses, and 7% shrubs while in autumn its 43% grasses, 34% forbs, and 14% shrubs (1). Previous research has demonstrated increased jackrabbit population during drought and reduced population in wet years (2). Damage by jackrabbit mostly occurs during winter and can be identified by their tracks, droppings, and markings (3), which is consistent with damage observed on turf. Dropping are pea-sized pellets that contain no plant nutritional value. Jackrabbits feeding on dormant bermudagrass remove foliar tissue down to stolons and partially dig into soil resulting in depressions (Fig. 1a). Limited information is available to recommend best practices for regrowth following damage to bermudagrass from jackrabbits.

Objectives

❖ To evaluate topdressing and fertilizer treatments to determine if more rapid recovery could be achieved
❖ To assess the improvements to foliar characteristics with topdressing and fertilizer

Materials and Methods

❖ Texas Tech Quaker Research Farm in Lubbock, TX
❖ ‘TifSport’ hybrid bermudagrass (Cynodon dactylon (L.) Pers. x C. transvaalensis Burtt Davy)
❖ Soil test conducted for nutrient contents (Table 1)
❖ Experimental Design
   ➢ RCBD with strip-split treatment arrangement
   ➢ Three replications per treatment combination
❖ Treatments
   ➢ Topdressing (sand, cotton burr compost, and control) at 0.64 cm depth (Fig. 1b)
   ➢ Fertilizers applied at 49 kg N/ha monthly (Table 2)
❖ General Management
   ➢ Reel mower at 1.3 cm three days/wk
   ➢ Irrigation at approximately 2.5 cm/wk
❖ Response variables collected weekly
   ➢ Visual turf quality (1-9 scale, 9=best)
   ➢ Visual bermudagrass cover (% of plot area)
   ➢ Digital image analysis with Turf Analyzer
   ➢ Percent green cover
   ➢ Hue and dark green color index
   ➢ NDVI Turf Color Meter (3/plot)
❖ Statistical Analysis in SAS 9.4
   ➢ Proc Mixed
   ➢ Interaction or main treatment factors at P≤ 0.05
   ➢ Mean separation by least significant difference at α = 0.05

Materials and Methods

Table 2. Fertilizers applied monthly to stimulate recovery and improved quality and color of turf

<table>
<thead>
<tr>
<th>Fertilizer</th>
<th>Analysis</th>
<th>$S/kg ($/lb)</th>
<th>Quantity for 49 kg N/ha</th>
</tr>
</thead>
<tbody>
<tr>
<td>Untreated</td>
<td>--</td>
<td>--</td>
<td>--</td>
</tr>
<tr>
<td>Control</td>
<td>--</td>
<td>--</td>
<td>--</td>
</tr>
<tr>
<td>Ammonium sulfate</td>
<td>21-0-0</td>
<td>0.51 (0.23)</td>
<td>2.2 kg/93 m²</td>
</tr>
<tr>
<td>PrimeraOne w/Apex10</td>
<td>16-4-8-13S-5Fe</td>
<td>1.08 (0.49)</td>
<td>2.8 kg/93 m²</td>
</tr>
<tr>
<td>Clarus Organic</td>
<td>16-2-3</td>
<td>0.88 (0.4)</td>
<td>2.8 kg/93 m²</td>
</tr>
<tr>
<td>Lesco General</td>
<td>28-3-10-4.5Fe</td>
<td>0.96 (0.43)</td>
<td>1.6 kg/93 m²</td>
</tr>
<tr>
<td>Lesco Starter</td>
<td>18-24-12</td>
<td>1.61 (0.73)</td>
<td>2.5 kg/93 m²</td>
</tr>
<tr>
<td>ProChem General</td>
<td>16-4-8-15S-5Fe</td>
<td>0.99 (0.45)</td>
<td>2.8 kg/93 m²</td>
</tr>
<tr>
<td>Milorganite</td>
<td>5-4-0-2.5Fe-1.2Ca</td>
<td>0.79 (0.36)</td>
<td>9.1 kg/93 m²</td>
</tr>
<tr>
<td>Vigoro Lawn</td>
<td>29-0-4 (7.3% slow)</td>
<td>2.04 (0.93)</td>
<td>1.6 kg/93 m²</td>
</tr>
<tr>
<td>Vigoro TX Lawn</td>
<td>15-5-10-3S-2Fe</td>
<td>1.47 (0.67)</td>
<td>3.0 kg/93 m²</td>
</tr>
</tbody>
</table>

Results

Figure 1: Fig (a) shows the initial damage by Jackrabbit, (b) shows topdressing treatments, (c) shows initial recovery, and (d) shows the final recovery at Quaker Research Farm, TX in 2018

❖ Figure 2 shows hue and dark green color index did not differ for sand and control topdressing, but improved with compost topdressing treatment 7 Days after treatment

❖ Figure 3 shows green cover from image analysis of untreated control treatments was reduced compared to fertilized treatments. However, no differences in fertilizers were observed for either response variable following four applications.

Conclusions

❖ No topdressing or fertilizer treatment improved recovery from jackrabbit damage
❖ Compost topdressing increased hue and DGCI within 7 days, but improvements dissipated afterwards
❖ Fertilizers never improved color or quality prior to four apps
❖ TifSport has poor recuperative potential (4)
❖ Turf quality, coverage, and color improved with fertilizer
❖ Four applications (49 kg N/93 m²) before treatment separation
❖ Nitrogen was key element; soil test showed adequate P and K
❖ No benefit from more expensive fertilizer products

Further Research

❖ Is there a critical or threshold population level to reduce damage?
❖ Do repellants assist with reducing populations?
❖ How frequently must repellants be applied?
❖ Could cultivation practices (aerification or vertical mowing) expedite recovery?
❖ Would additional applications of topdressing improve recovery rate?

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References


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References