

Application Timing for Dallisgrass Control in Bermudagrass Forage

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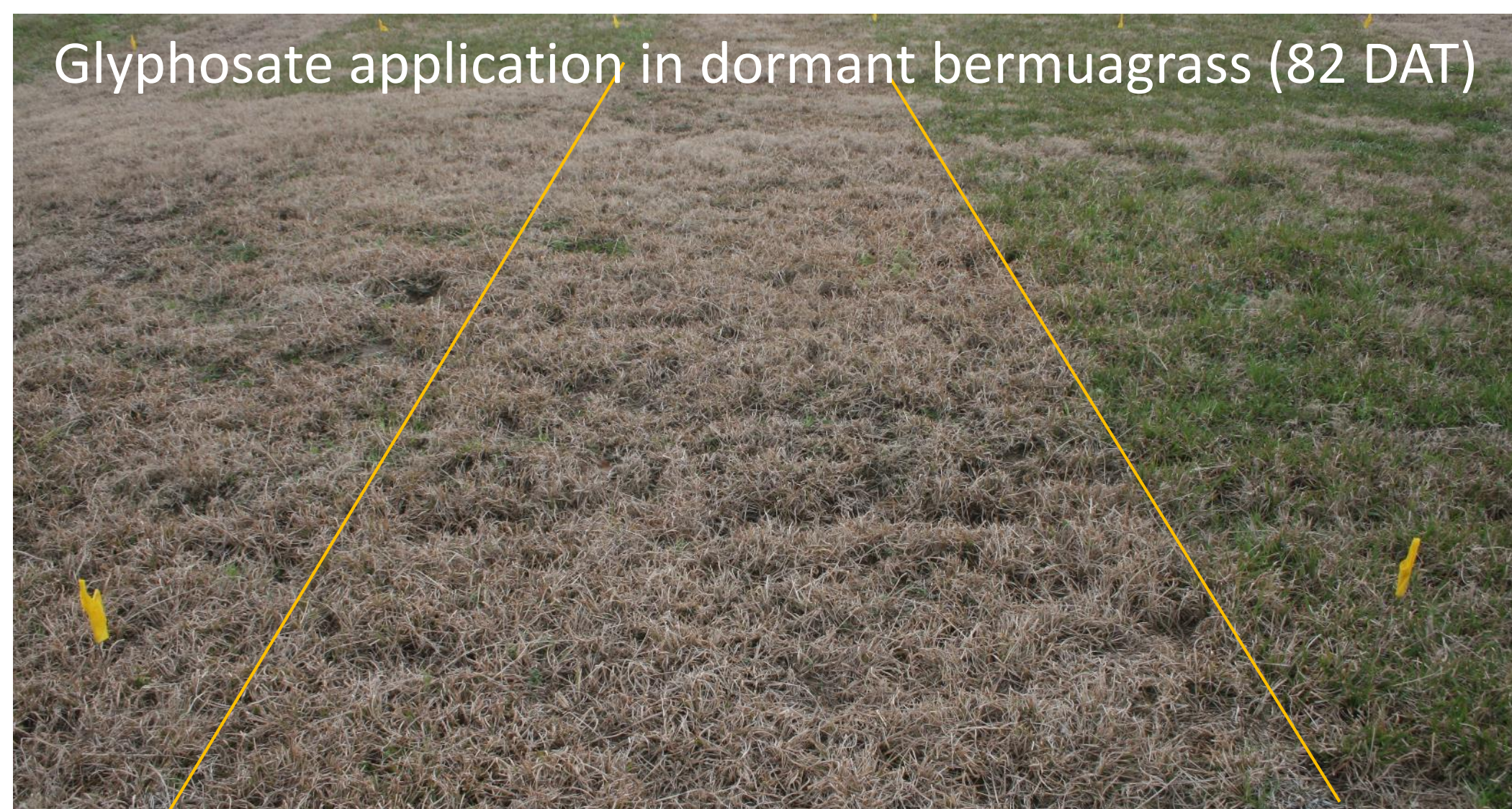
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INTRO

- Many bermudagrass (*Cynodon dactylon*) producers are often paid a premium by clients desiring clean, quality forage. Although dallisgrass (*Paspalum dilatatum*) has some desirable qualities, this coarse-textured, clump-type, perennial grass is viewed as a major weed in these systems.
- In-season applications of forage-labeled herbicides are too injurious to desirable species and only provide short-term dallisgrass suppression.
- Dallisgrass often retains green foliage longer after first frost compared to bermudagrass, indicating some level of photosynthesis activity and therefore greater herbicide susceptibility.
- Cooling-Degree-Day (CDD) accumulation is an effective measure of determining effects of atmospheric cooling below a certain threshold (average daily temperatures below 72°F (22°C)), when dallisgrass growth begins to slow (Elmore et. al 2012).
- Breeden & Brosnan (2009) found glyphosate applications made following frost and bermudagrass dormancy were effective in dallisgrass control and bermudagrass safety

Glyphosate application in dormant bermudagrass (82 DAT)



METHODS

- A 2 x 4 factorial arrangement of treatments were setup in a RCB design evaluating 2 application times and 4 herbicide treatments
- - Application A: 11/28/18
- - Application B: 2/18/19
- - 840 & 1680 g ae/ha glyphosate = 21.3 & 42.7 fl oz/A (0.75 & 1.5 lb ae) Roundup Powermax
- - 105 & 210 g ai/ha imazapic = 6 & 12 fl oz/A (0.094 & 0.188 lb ai) Plateau
- Two locations near Starkville, MS
- 3.0 x 9.1m (10 x 30') plots with 3 replications
- Cooling Degree Days (CDD) = 22 - [(Tmax+Tmin)/2]
- Accumulation was determined using a 22°C base beginning August 1
- Growing Degree Days (GDD) = [(Tmax+Tmin)/2] - 10
- Accumulation was determined using a 10°C base beginning January 1
- Dependent variables measured:
 - % reduction in dallisgrass occurrence (0 -166/84 DAT)
 - M² quadrats with 25 sub-squares each were used 2x per plot to determine frequency/occurrence
 - % visual control 113/31 DAT
 - % visual bermudagrass coverage 166/84 DAT
 - Dallisgrass dry weight yield (kg/ha)
 - Dallisgrass was hand-harvested to a 5 cm height within square meter quadrats, 2x per plot on May 20, 2019 (173/91 DAT)
- Results were analyzed in SAS 9.4. Data were subjected to ANOVA by PROC GLM and means separated with Fisher's LSD (α=0.05).

Timing post-frost applications of glyphosate when cooling degree days reach 460_{22°C} could reduce dallisgrass by 67% and promote bermudagrass coverage by 35% the following spring.

RESULTS

- Glyphosate at either rate applied November 28th had the greatest reduction in dallisgrass occurrence (>67% reduction) by 166/84 DAT
- Visual control was greatest (>90%) at 113/31 DAT from either rate of glyphosate or imazapic when applied in November and either rate of February-applied glyphosate
- November and February glyphosate applications at both rates and the high rate of imazapic in November resulted in the greatest bermudagrass % cover by 166/84 DAT
- Dallisgrass dry matter yield was the lowest with either glyphosate applied in November at either rate, or the high rate of glyphosate or imazapic in February
- App. A = 460 CDD_{22°C}
 - Following the first 4 frosts (<0°C)
- App. B = 76 GDD_{10°C}

DISCUSSION

- At a lat./long. of 33.4°N, -88.7°W following four nights below 0°C, and CDD_{22°C} accumulation of 460, dallisgrass was susceptible to at least 840 g ae/ha glyphosate
- Field observations should accompany CDD_{22°C} accumulation to ensure bermudagrass dormancy
- Imazapic, and other ALS-inhibiting herbicides, require active growing conditions for optimal activity

• Breeden, GK and Brosnan, JT. SP642-Dallisgrass (*Paspalum dilatatum*), UT Extension Service, SP 642-2/09 09-0183
 • Elmore, MT, Brosnan, JT, and Breeden, GK. 2012. Effects of Herbicide Application Timing and Overseeding on Dallisgrass (*Paspalum dilatatum*) control in Tall Fescue (*Festuca arundinacea*). Proc. Of ASA-CSSA-SSSA, Cincinnati, OH.

