RyzUp SmartGrass® Effects on Smooth Brome Growth and Yields

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Various aspects of smooth brome (Bromus inermis) growth were documented in response to various RyzUp SmartGrass® application aspects (differing rates, surfactants, soil fertility) during 2013 and 2014 in southeastern Nebraska. Application of RyzUp SmartGrass® treatments resulted in highly visible and significantly taller forage heights for 30 days post treatment, while chlorophyll concentration levels were reduced. RyzUp SmartGrass® treatments increased hay production by up to 49% at 30 days post treatment. Application to highly fertilized hay fields resulted in 7-14% more hay at 60 days post treatment, with less response noted at lesser fertility levels. Treatments also resulted in numerically more stems/area in highly fertilized areas, but not other sites. Differences in growth responses were noted from various surfactants when used with RyzUp SmartGrass® and at approximately 30 days post treatment, however, significantly greater brome production was noted when ClassAct NG was used with RyzUp SmartGrass®.

Introduction

Recent high forage prices resulted in increased interest and need to economically increase forage production, especially for that of various grass hay species such as smooth brome (Bromus inermis). Initial screening research had documented that RyzUp SmartGrass® (active ingredient = gibberellic acid 3, Valent USA) was highly effective in increasing smooth brome production, however, additional data were needed for smooth brome growth response to other aspects (rate, surfactants, etc.) of RyzUp SmartGrass®.

This project evaluated smooth brome growth in response to application of three rates of RyzUp SmartGrass® and the effect of various surfactants when applied to smooth brome hay fields that had varying levels of soil fertility.

Methods and Materials

Three rates (0.3, 0.6 and 0.9) oz./acre of RyzUp SmartGrass® were applied to smooth brome in four locations in eastern Nebraska in the early spring of 2013 and 2014. Locations varied in fertility levels and plant growth stage, with one site (Rising City) being almost deficient in soil nitrates and phosphorus levels at time of application, one site (Dorchester) had medium levels of soil nitrates, while both David City locations were well fertilized. The Rising City location was fertilized with a high rate of ammonium sulfate approximately 5 days after RyzUp SmartGrass® application to provide necessary nitrogen, however, phosphorus was not included for plot fertilization at this site.
Three differing surfactants (Kinetic, Helena Company, Memphis, TN; BioLink Spreader Sticker, Westbridge Agricultural Products, Vista, CA; AgriSolutions ClassAct NG, Winfield Solutions, LLC, St. Paul, MN) were also evaluated with the low rate of RyzUp SmartGrass® at the three 2014 locations (David City, Dorchester, Rising City) as had been done at a 2013 location (Brainard).

Kinetic consists of 99% polyethylene-polyoxypropylene copolymer, polysiloxane polyether copolymer. It was used at the rate of 6 oz./100 gallons.

ClassAct NG consists of 50.5% ammonium sulfate, corn syrup and alkyl polyglycoside. It was used at 2.5% v/v, and provided 0.5 lbs./acre of nitrogen and 0.57 lbs./acre of sulfur.

BioLink spreader-sticker was used at 4 oz./acre (1.12 oz./acre), and consists of 10.1% soapbark in addition to alkylphenol ethoxylate and polysaccharide.

Treatments were applied with a backpack sprayer calibrated to deliver 28 gallons/acre to plots that were 7 foot wide x 25 foot long. Each treatment had four replications at each site utilizing a randomized complete block design.

Plant data were collected weekly for standing forage heights and extended leaf heights for approximately 30 days after application. Forage yields were obtained at approximately 30 and 60 days post treatment in 2013.

Results

Rate responses were noted in both 2013 and 2014, with taller forage height and extended leaf heights trending higher as rate increased early after application. This was noted at all sites (Figs. 1-3).

An early growth response trend was also noted among the different surfactants, with greatest early growth noted when ClassAct NG was utilized (Fig. 2-4).

Differences were visibly noted for approximately 21 days after treatment, with differences readily available at some locations beyond this.

The visible differences were also noted in smooth brome hay yields obtained from the 2013 experimental site (Brainard) where the surfactants were evaluated. Highest mean smooth brome yields at 28 days post treatment among the surfactants used with RyzUp SmartGrass® was noted from usage of ClassAct NG (2,995 lbs./acre), followed by usage of BioLink and then Kinetic (Fig. 5). Untreated smooth brome had significantly less yield (2,363 lbs/acre), while addition of 20-20-20 fertilizer also provided a growth response on this site which was slightly deficient for soil phosphorus.

Summary

Smooth brome growth was shown to responsive positively as rate of RyzUp SmartGrass® increased at multiple locations during this study.

Yield data documented an 11% increase from usage of all rates of RyzUp SmartGrass® on smooth brome in 2013 at the David City location, however this amount of increase was not noted in hay fields with less than optimum fertility.
Data also indicated that utilizing differing surfactants with this product also resulted in differences in early smooth brome growth. This was noted in all four experiments which evaluated surfactants while applying RyzUp SmartGrass®.

The reason for differences in smooth brome growth is unknown. The surfactant in these experiments which resulted in most growth was ClassAct NG. This product does contain nitrogen. It was noted that the addition of 20-20-20 to RyzUp SmartGrass® also increased growth. Further experimentation is necessary to elucidate the role of nitrogen may have in efficacy of RyzUp SmartGrass®.

Figure 1. Mean extended leaf height smooth brome heights resulting from application of three rates of RyzUp SmartGrass®, David City, NE, 2013.
Figure 2. Mean extended leaf heights resulting from application of three rates of RyzUp SmartGrass® and differing surfactants, Dorchester, NE, 2014.

Figure 3. Mean extended leaf height smooth brome heights resulting from application of three rates of RyzUp SmartGrass® and three surfactants, David City, NE, 2014.
Figure 4. Mean natural forage and extended leaf height smooth brome heights resulting from application of three rates of RyzUp SmartGrass® and three surfactants, Rising City, NE, 2014.

Figure 5. Mean smooth brome hay yields (lbs./acre) at 28 days post treatment with fertilizer and/or RyzUp SmartGrass® on April 24, 2013, Brainard, NE.