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### **Smutgrass Management in Florida Pastures: Gaining Insight From Recent Research**

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Smutgrass species have been problematic in Florida pastures for the last 60-70 years. It is a perennial bunch-type grass that is capable of producing at least 45,000 seeds per plant. Our recent work with seed germination shows that seed can germinate nearly year-round, but germination will most likely occur during the rainy season when soil moisture is relatively high. Although the hot and rainy conditions of summer are optimum for seed germination, it is common to see smutgrass seedlings in the spring and fall if soil moisture is adequate. Therefore, prevention of seed production is necessary to limit the amount of smutgrass spread. Preventing seed production, however, is extremely difficult considering that seeds are produced as early as March in south Florida, and mowing tends to stimulate seed-head production.

Native soils of south Florida tend to be acidic, with soil pH values of 4.5 to 5.0 quite common. In general, we tend to believe that weed invasions are the result of less than optimum growing conditions for bahiagrass, and that increasing the soil pH to the optimum level of 5.5 will aid in reducing the number of weed infestations, including smutgrass. Our greenhouse work looking at the competitive ability of giant and small smutgrass with bahiagrass revealed some interesting trends. Both giant smutgrass and bahiagrass had poor growth at soil pH 4.5 (Figure 1). Giant smutgrass outperformed bahiagrass when soil pH was raised to 5.5 and 6.5. Small smutgrass outperformed bahiagrass only when the soil pH was adjusted to 6.5. We cannot suggest that liming pastures will help bahiagrass out compete smutgrass in Florida pastures. However, it is extremely important to keep in mind that maintaining the soil pH at 5.5 allows bahiagrass to efficiently utilize soil nutrients.

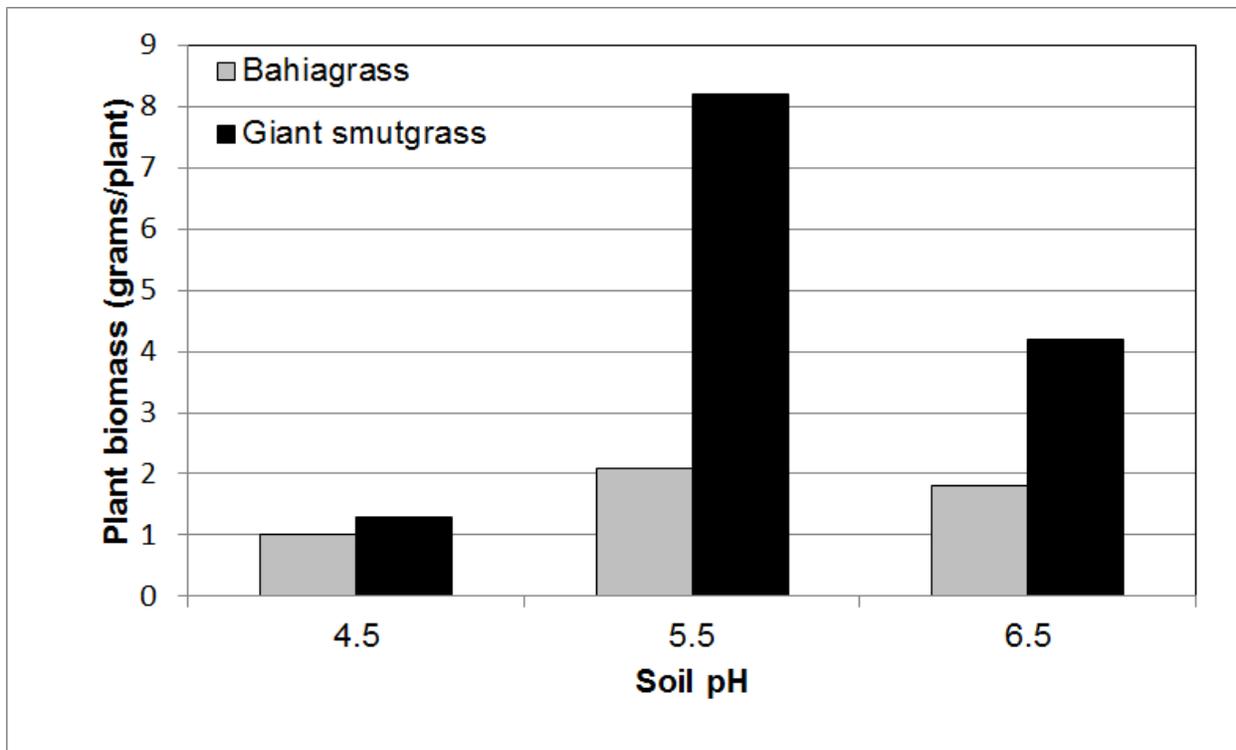
Currently, the only viable option for smutgrass control is applying an equivalent rate of 1.0 lb/acre hexazinone (2 qt/A Velpar or 1.67 qt/A Velossa) during the rainy season (July through September). This amount of hexazinone is quite expensive relative to other weed control products and optimizing control with this herbicide must be taken into consideration. Rainfall after application is essential since hexazinone has relatively no leaf activity and must be absorbed by plant roots. This being the case, no additional surfactant is needed when applying hexazinone. It cannot be overstated that the activity of hexazinone is limited by the amount of rainfall received within two weeks after application. If limited rainfall is received, a reduced amount of control should be expected.

During the past four years we have examined the effects of a multi-year approach to smutgrass management. We have determined that burning during the late winter prior to applying hexazinone has no long-term effects on smutgrass control. However, it does allow for removal of smutgrass thatch, allowing for an increase in bahiagrass regrowth once the smutgrass has been controlled with hexazinone. We also investigated the impact of applying a half-rate (0.5 lb/A hexazinone) one year after completely renovating bahiagrass pastures. In this situation, smutgrass reinfestation after replanting was quite high, but the application of 0.5 lb/A hexazinone the following summer resulted in excellent smutgrass control. To date, very little smutgrass has reinfested the pastures where we replanted bahiagrass, and we continue to monitor these pastures for long-term control.

Fertility management in conjunction with hexazinone applications may also be important. In a separate experiment we applied a full rate of hexazinone to an entire pasture in year one. In the second year, we applied hexazinone at either 0 or 0.5 lb/A with or without 50 lb/A nitrogen. The initial application of hexazinone resulted in nearly 100% smutgrass control throughout the pasture. The long-term effects of the second application of hexazinone with or without nitrogen continue to be under evaluation, however, we are seeing a trend of reduced smutgrass invasion in plots which received both hexazinone and nitrogen the second year compared to all other treatments.

Lastly, we have examined the effect of sequential hexazinone applications at various application rates over a two year period. Obviously, applying a full rate of hexazinone results in excellent smutgrass control. Our results show that applying a half-rate (0.5 lb/A) of hexazinone two years in a row results in similar levels of control compared to applying a single full rate of hexazinone (Table 1). This could allow for spreading the cost of smutgrass control over a two year period, and can also result in an increase in the amount of acres that can be managed if you have budgeted a specific amount of money to control smutgrass. For example, if you have budgeted \$4,000 for smutgrass control, and the full rate of hexazinone is applied, a total of 80 to 100 acres can be treated. However, if the half-rate is applied, the amount of acreage can be doubled. We continue to monitor these studies as well to understand the long-term effects of these sequential treatments on smutgrass control.

While we have not yet changed our recommendations regarding smutgrass control with hexazinone, this research is allowing us to reconsider those recommendations. The field experiments we have conducted over the past four years continue to be monitored for their effects on long-term smutgrass control. It is our intention to review our data after this growing season to determine the best tactics for smutgrass management. As always, if you have questions concerning smutgrass management on your ranch, please contact your county extension agent.



**Figure 1.** Impact of soil pH on the competitive growth of bahiagrass with giant smutgrass under greenhouse conditions. Bahiagrass and giant smutgrass were grown in equal proportions at a density of four plants per gallon-sized pot.

**Table 1.** Impact of single and sequential hexazinone applications on smutgrass control 24 months after the 2009 application.

2008 Hexazinone rate (lb/A)	2009 Hexazinone rate (lb/A)	# of plants per plot 24 MAT <sup>a</sup>	Cost/A in 2008 (\$)	Cost/A in 2009 (\$)	Total Cost/A for 2 years (\$)
0.00	0.00	11.7	0.00	0.00	0.00
0.00	0.50	12.7	0.00	20.00	20.00
0.50	0.50	1.0	20.00	20.00	40.00
0.75	0.00	2.5	30.00	0.00	30.00
0.75	0.50	0.8	30.00	20.00	50.00
1.00	0.00	1.5	40.00	0.00	40.00

<sup>a</sup>MAT = months after treatment. In this table, the number of plants indicated are the number of plants 24 months after hexazinone application in 2009.