

## Roundup Ready® Alfagraze.

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The transgene, Roundup Ready® (RR), provides tolerance to the herbicide Roundup® (glyphosate). It was first introduced in soybeans in 1996, and is the initial biotech trait in alfalfa. ‘Alfagraze’, released in 1991, was the first dual purpose alfalfa cultivar with high yield that persists under intensive grazing and led the way for future grazing tolerant cultivars. The objective of this research project was to develop new cultivars of Alfagraze with RR and improved pest resistances across different fall dormancy groups.

Several new lines derived mainly from Alfagraze were developed in different fall dormancy groups that contain commercially acceptable levels of pest resistance. A collaborative research partnership was also formed with Forage Genetics International (FGI) to backcross RR into these new Alfagraze-type experimentals. During 2001, a testing program on the initial RR experimentals was begun in collaboration with Monsanto and FGI under the UGA Biosafety Office and observance of USDA-APHIS regulations. We used standard testing protocols for grazing tolerance (see <http://www.naaic.org>) to establish and conduct the trial. These trials confirmed that all RR experimentals possessed acceptable grazing tolerance. The plots were then sprayed with Roundup and the best genotypes were removed and inter-mated to produce two synthetic cultivars, Alfagraze 300 RR and Alfagraze 600 RR. These cultivars possess similar pest resistances (resistance to bacterial wilt, verticillium wilt, fusarium wilt, anthracnose, phytophthora root rot, aphanomyces, and pea aphid), but vary in fall dormancy with the Alfagraze 300 RR possessing a 3 fall dormancy rating and Alfagraze 600 RR a 6 dormancy rating. In 2005, USDA-APHIS de-regulated RR in alfalfa opening a path to market for these cultivars. Data indicate both cultivars possess dry matter yields comparable to acceptable checks (Table 1) and grazing tolerance similar to Alfagraze (Figure 1).

State	Alfagraze 300 RR	Ameristand 403T	State	Alfagraze 600 RR	WL625HQ
WA	10.4	9.8	ID	6.1	5.7
IA	9.0	9.1	CA	6.7	6.7
ID	6.4	6.3			
IN	6.3	6.2			
PA	5.7	6.1			
<b>Mean</b>	<b>7.6</b>	<b>7.5</b>	<b>Mean</b>	<b>6.4</b>	<b>6.2</b>

Figure 1. Grazing survival. Bars with the same letters are not significantly different ( $p < 0.05$ ).

