



## Orchardgrass Variety Trials 2007-2009

### Recent Research Results

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## Introduction to Orchardgrass

**Adaptation:** Short-lived grass that should only be planted north of Gainesville. Less tolerant of drought, poor drainage, and close grazing than tall fescue.

**Establishment:** Seed should be planted at 12-15 lb/A or 15 - 20 lb/A broadcast in September.

**Recommended Varieties:** Olympia, Benchmark Plus

Orchardgrass is adapted to the more fertile soils in the Limestone Valley/Mountains Regions and some upper Piedmont sites. However, orchardgrass is not recommended for the lower Piedmont or Coastal Plain regions.

It is a bunch grass that produces an open sod and produces excellent quality forage. It is not as persistent as tall fescue. Even under ideal conditions, stands usually thin after 2 – 3 years and will need to be renovated. Though it can be grazed, orchardgrass stands will generally thin more rapidly in pastures. Orchardgrass stands are easier to maintain if they are cut for hay.



**Orchardgrass** (*Dactylis glomerata*)

Mixtures of tall fescue and orchardgrass are widely used in hayfields in the upper Piedmont and Mountain regions. Orchardgrass is also a great companion crop with a legume, such as red clover or alfalfa. A common use of orchardgrass is to seed it into alfalfa stands that have thinned.

Orchardgrass is best established on a prepared seedbed, though no-till establishment into an alfalfa or red clover stand will result in satisfactory results. Orchardgrass should be established in the fall. Plant 12 – 15 lbs of orchardgrass per acre when using a grain drill or sod seeding drill. When seed are broadcast and incorporated by disking or dragging, increase the seeding rate to 15 – 20 lbs per acre.

## Description of the Variety Trials

Orchardgrass variety entries were solicited from the companies who sell them. These companies were charged an entry fee for each variety they entered and for each location in which the variety was tested. This entry fee helped to cover some of the costs of the variety trial.

The tests were planted at Georgia Agriculture Experiment Station (GAES) facilities and maintained by experienced research technicians and other GAES staff under the supervision of the State Forage Extension Specialist. The orchardgrass trials were established and managed using standard practices as recommended by UGA Specialists. Unless otherwise indicated, the trials were established by drilling the orchardgrass seed into a well-prepared seedbed at the rate of 15 lbs of pure live seed (PLS) per acre. Specific planting dates for individual locations are described in the Yield by Harvest Date sections. Soil fertility was maintained in accordance with soil fertility recommendations.

Two types of variety trials were conducted. The first type is the yield trial. Yield-type variety trials simulate forage productivity under a hay production regimen or a well-managed rotational grazing regimen. The tests generally continued for at least three years. Tables that indicate a summary of data from 2008 through 2009 will be continued in 2010. Tests are only ended before three years when the stands of the majority of the entries deteriorate below 60% basal area coverage (60% stand). To our knowledge, no orchardgrass variety trials conducted by UGA have failed to complete three years because of stand deterioration. Trials that were cut for yield after 2006 also were assessed annually for stand persistence in a manner similar to that described for the grazing persistence trials below.

The second type of variety trial is the grazing persistence trial. In this trial type, orchardgrass varieties were planted and managed similar to the yield trials. Once the stand was well-established (i.e., > 6 inches tall), however, the plots were subjected to continuous grazing pressure by mature beef cows during the growing season of the three years of the trial. The result of this grazing pressure was a simulation of severe over-grazing. Stands were assessed using a quantitative measure of the plot area that is covered by living orchardgrass plants after harvest (basal area coverage). This stand assessment usually was made during the dormant season (winter).

Statistical analyses were performed on all data to determine if the numerical differences were truly the result of varietal differences or just random differences. To determine if two varieties are truly different, compare the difference between them and the LSD (Least Significant Difference) at the bottom of the column. If the difference is equal to or greater than the LSD, the varieties are truly different when grown under the conditions at the given locations. The comparison is aided by the fact that the value for the best variety within a column is bolded. In addition, values sharing the same letter are not different. NS indicates no differences were observed. The Coefficient of Variation (CV) is a measure of the variability of the data and is included for each column of means when differences exist. Low variability is desirable (generally, a CV less than 15%).



Example of (top) a highly productive orchardgrass variety growing in plot used in the yield trial and (bottom) a series of plots in grazing persistence trial at Eatonton.

## Orchardgrass Yield Trial Summary

**Table 1.** Forage yield of orchardgrass varieties averaged over the 2007 – 2009 growing seasons in Blairsville, GA and 2008 – 2009 growing seasons in Athens, GA.<sup>†</sup>

Variety	Blairsville	Athens
	3-yr Average (2007-09)	2-yr Average (2008-09)
Barlemas	-	7169
Benchmark Plus	7170 a <sup>‡</sup>	6763
Olympia	7136 a	-
OG 0204G <sup>§</sup>	6762 ab	-
OG 0205G <sup>§</sup>	6561 ab	-
IADG 101 <sup>§</sup>	6439 b	7062
Tekapo	4828 c	-
CV %	15	-
LSD <sub>α=0.05</sub>	695	NS

<sup>†</sup> Planted in Blairsville on October 25, 2006 and in Athens on October 10, 2007.

<sup>‡</sup> Values within a column that are labeled with the same letter were not significantly different ( $\alpha=0.05$ ) from one another. Values that are in **bold** font are not significantly different from the best variety at that time.

<sup>§</sup> Experimental variety (not available).

## Stand Assessments (Yield Trial) – Blairsville

**Table 2.** Percent basal cover of orchardgrass varieties in the yield trial located at Blairsville, GA. 2007-2008.<sup>†</sup>

Variety	Percent basal cover within row		
	May 8, 2007	Jan. 24, 2008	Dec. 15, 2008
Olympia	93.0 a <sup>‡</sup>	88.5 a	87 a
IADG 101 <sup>§</sup>	94.5 a	85.0 a	86 a
Benchmark Plus	95.5 a	92.0 a	82 ab
OG 0204G <sup>§</sup>	89.0 ab	74.5 bc	75 abc
OG 020G <sup>§</sup>	82.5 b	82.5 ab	70 bc
Tekapo	71.5 c	66.5 c	64 c
CV %	7	9	13
LSD <sub>α=0.05</sub>	8.47	10.21	12.73

<sup>†</sup> Planted: October 25, 2006.

<sup>‡</sup> Values within a column that are labeled with the same letter were not significantly different ( $\alpha=0.05$ ) from one another. Values that are in **bold** font are not significantly different from the best variety at that time.

<sup>§</sup> Experimental variety (not available).

## Stand Assessments (Yield Trial) – Athens

**Table 3.** Percent basal cover and vigor estimate of orchardgrass varieties in the yield trial located at Athens, GA. 2008.<sup>†</sup>

Variety	January 31, 2008		Dec. 14, 2009
	Basal cover within row	Visual vigor estimate 5 best	Basal cover within row
IADG 101 <sup>§</sup>	80 b <sup>‡</sup>	2.0	86.3
Benchmark Plus	<b>96 a</b>	3.3	69.4
Barlemas	<b>86 ab</b>	2.8	63.8
CV %	7		
LSD $\alpha=0.05$	11	NS	NS (.09)

<sup>†</sup> Planted: October 10, 2007.

<sup>‡</sup> Values within a column that are labeled with the same letter were not significantly different ( $\alpha=0.05$ ) from one another. Values that are in **bold** font are not significantly different from the best variety at that time.

<sup>§</sup> Experimental variety (not available).

## Stand Assessments (Grazing Trial) – Calhoun

**Table 4.** Percent basal cover of orchardgrass varieties in the grazing persistence trial at Calhoun, GA. 2007-2009.<sup>†</sup>

Variety	Percent basal cover within row			
	May 7, 2007	April 10, 2008	April 30, 2009	% of org. stand
Olympia	86	73 a <sup>‡</sup>	48 a	56 a
Benchmark Plus	89	59 a	18 b	21 b
IADG 101 <sup>§</sup>	89	29 c	20 b	23 b
OG 0204G <sup>§</sup>	87	25 c	22 b	25 b
OG 0205G <sup>§</sup>	87	19 c	9 b	11 b
Tekapo	87	13 c	2 b	2 b
CV %		42	46	45
LSD $\alpha=0.05$	NS	23	25	28

<sup>†</sup> Planted: October 25, 2006.

<sup>‡</sup> Values within a column that are labeled with the same letter were not significantly different ( $\alpha=0.05$ ) from one another. Values that are in **bold** font are not significantly different from the best variety at that time.

<sup>§</sup> Experimental variety (not available).

## Stand Assessments (Grazing Trial) – Eatonton

**Table 5.** Percent basal cover of orchardgrass varieties in the grazing persistence trial at Eatonton, GA. 2007-2009.<sup>†</sup>

Variety	Percent basal cover within row			
	June 14, 2007	Jan. 4, 2008	Dec. 4, 2008	Dec. 15, 2009
IADG 101 <sup>§</sup>	99	92	79a <sup>‡</sup>	86 a
Olympia	98	91	78 a	90 a
Benchmark Plus	97	89	64 b	69 b
CV %			5	19
LSD $\alpha=0.05$	NS	NS	5.0	11.7

<sup>†</sup> Planted: November 1, 2006.

<sup>‡</sup> Values within a column that are labeled with the same letter were not significantly different ( $\alpha=0.05$ ) from one another. Values that are in **bold** font are not significantly different from the best variety at that time.

<sup>§</sup> Experimental variety (not available).

## Yield by Harvest Date – Blairsville

**Table 6.** Forage yield of orchardgrass varieties at Blairsville, GA. 2007- 2009.<sup>†</sup>

Year	Variety	Dry Matter Yield					Total
		----- lbs/acre -----					
		Harvest Date					
2007		<b>Mar. 8</b>	<b>July 16</b>	<b>Aug. 10</b>	<b>Sept. 12</b>	<b>Nov. 13</b>	
	Olympia	1328 a <sup>‡</sup>	1133 ab	2199	469 a	1042 a	6171 a
	Benchmark Plus	1279 ab	1323 a	2151	361 ab	1039 a	6153 a
	OG 0204G <sup>§</sup>	1072 bc	1211 ab	2260	206 a	645 b	5394 ab
	IADG 101 <sup>§</sup>	1318 ab	1022 b	1847	339 abc	615 b	5141 b
	OG 0205G <sup>§</sup>	948 c	1234 a	1908	241 bc	672 b	5003 b
	Tekapo	445 d	823 c	1982	371 c	570 b	4141 c
	CV %	18	13		35	24	12
LSD <sub>α=0.05</sub>	253	199	NS	147	245	834	
2008		<b>Apr. 22</b>	<b>July 1</b>	<b>Sept. 26</b>			<b>Total</b>
	OG 0204G <sup>§</sup>	2470 bc	3043 a	3279			8792
	OG 0205G <sup>§</sup>	2109 c	2994 a	3036			8139
	Olympia	3200 a	1313 d	3625			8138
	Tekapo	2227 c	2401 b	3101			7729
	Benchmark Plus	2992 ab	1965 bc	2619			7576
	IADG 101 <sup>§</sup>	2640 abc	1855 c	2710			7205
	CV %	17	16				
LSD <sub>α=0.05</sub>	597	471	NS			NS	
2009		<b>May 7</b>	<b>June 24</b>	<b>Sept. 3</b>	<b>Nov. 20</b>		<b>Total</b>
	Benchmark Plus	2774 a	1081 a	1633	2292		7780 a
	Olympia	2846 a	1038 a	1400	1815		7099 ab
	IADG 101 <sup>§</sup>	3311 a	1097 a	963	1599		6970 ab
	OG 0205G <sup>§</sup>	2199 b	1239 a	1090	2012		6540 ab
	OG 0204G <sup>§</sup>	1886 b	1074 a	1161	1978		6099 b
	Tekapo	108 c	610 b	633	1263		2614 c
	CV %	20	25				17
LSD <sub>α=0.05</sub>	572	343	NS	NS		1387	

<sup>†</sup> Planted: October 25, 2006.

<sup>‡</sup> Values within a column that are labeled with the same letter were not significantly different ( $\alpha=0.05$ ) from one another. Values that are in **bold** font are not significantly different from the best variety at that time.

<sup>§</sup> Experimental variety (not available).

## Yield by Harvest Date – Athens

**Table 7.** Forage yield of orchardgrass varieties at Athens, GA. 2008- 2009.<sup>†</sup>

Year	Variety	Dry Matter Yield					Total
		lbs/acre					
		Harvest Date					
2008		Mar. 28	May 7	June 17	Aug.29	Dec. 5	
	Benchmark Plus	1339	2737	1425 a <sup>‡</sup>	248	2045	7794
	Barlemas	946	2797	1161 b	158	2058	7120
	IADG 101 <sup>§</sup>	1076	2695	1055 b	198	1877	6901
	CV %			10			
	LSD <sub>α=0.05</sub>	NS	NS	207	NS (.07)	NS	NS
2009		Apr. 25	May 29	Aug. 6	Oct.20	Dec.1	Total
	IADG 101 <sup>§</sup>	2801	1164	967	1994	298	7223
	Barlemas	2855	1334	826	1792	411	7217
	Benchmark Plus	2569	1059	654	1275	175	5732
	CV %						
	LSD <sub>α=0.05</sub>	NS	NS	NS	NS	NS	NS

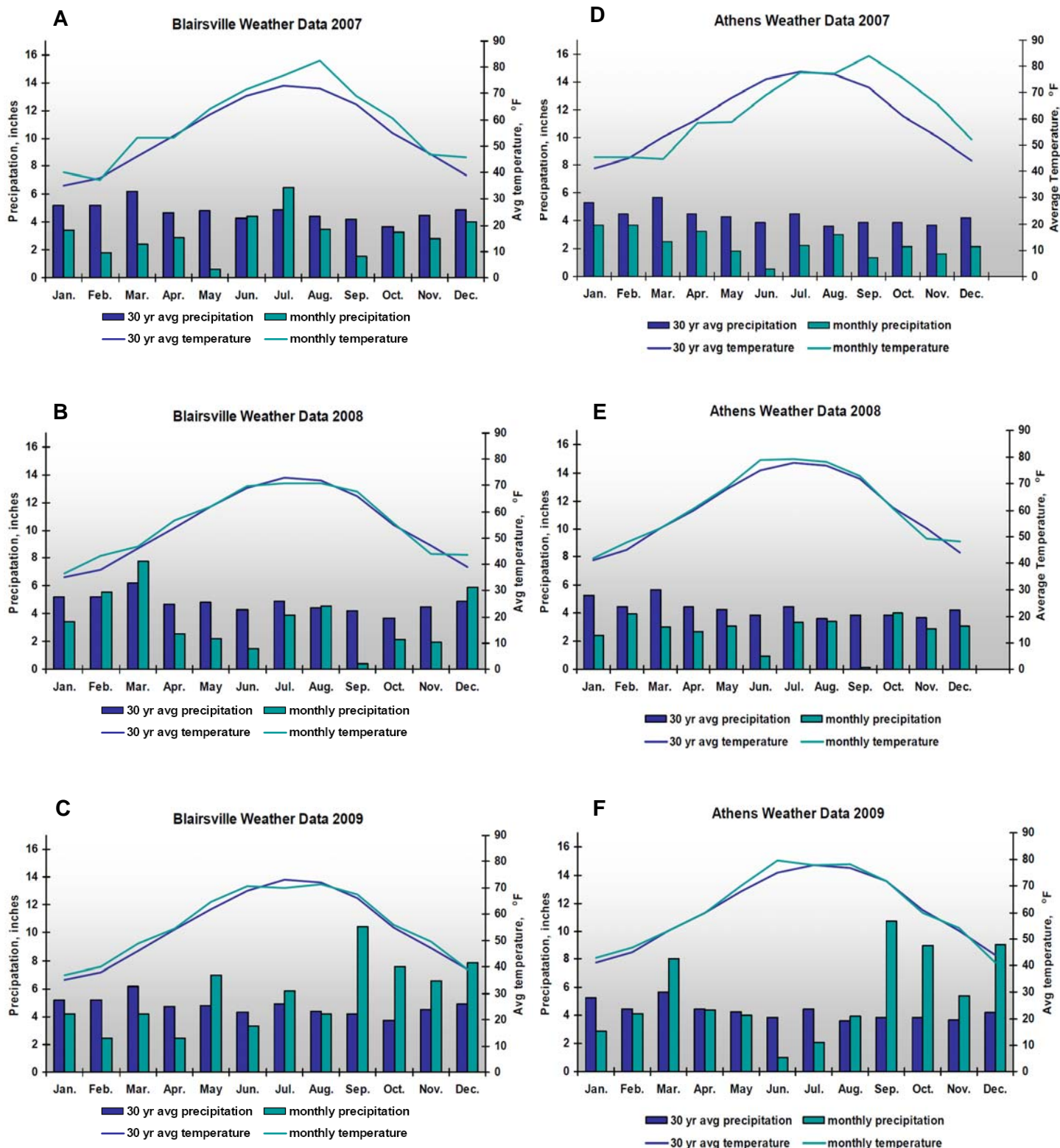
<sup>†</sup> Planted: October 10, 2007.

<sup>‡</sup> Values within a column that are labeled with the same letter were not significantly different ( $\alpha=0.05$ ) from one another.

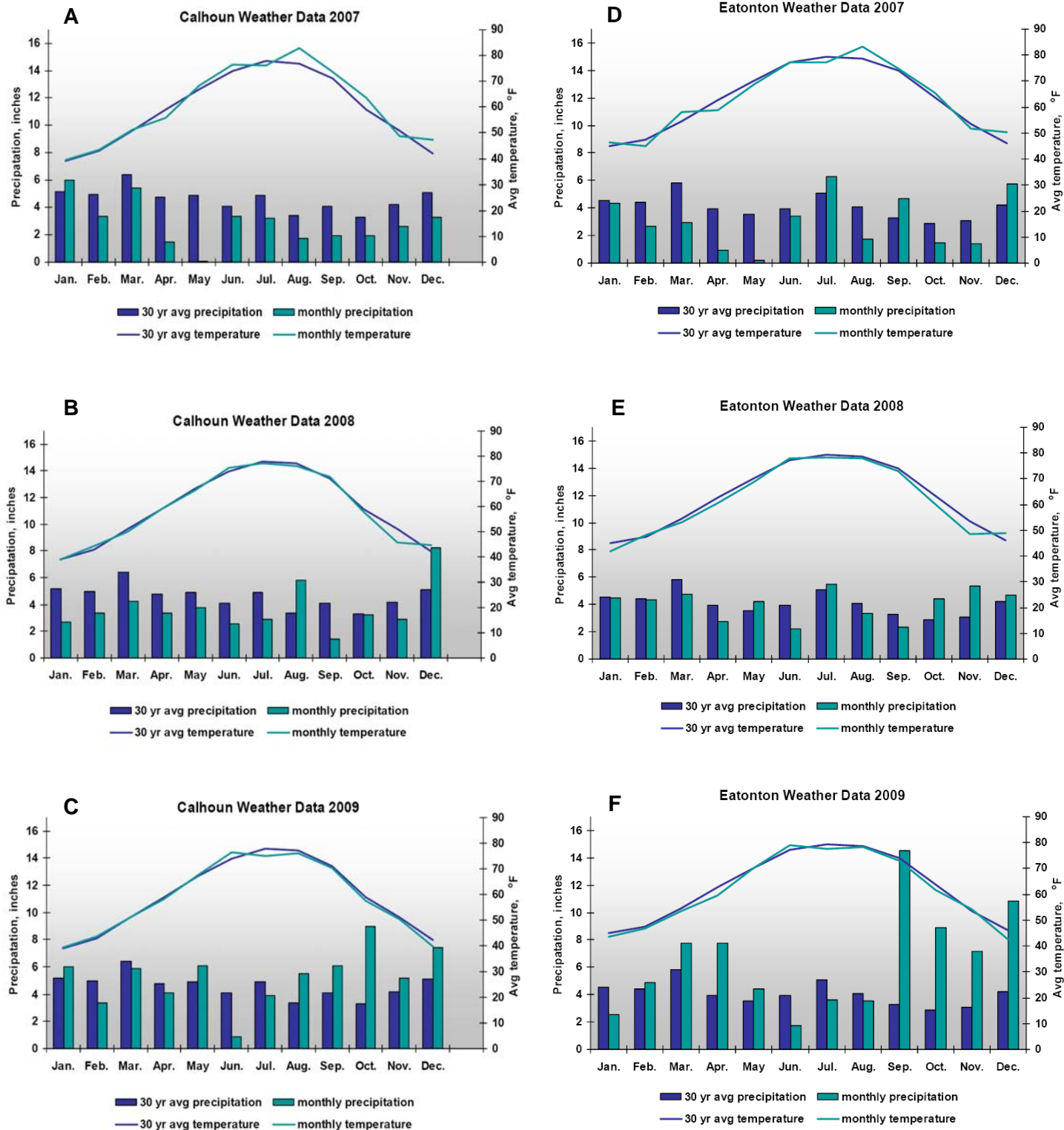
Values that are in **bold** font are not significantly different from the best variety at that time.

<sup>§</sup> Experimental variety (not available).

# Weather Data during Trials:



**Figure 1.** Weather data during the 2007 (A), 2008 (B), and 2009(C) growing seasons in Blairsville and the 2007 (D), 2008 (E), and 2009 (F) growing seasons in Athens.



**Figure 3.** Weather data during the 2007 (A), 2008 (B), and 2009(C) growing seasons in Calhoun and the 2007 (D), 2008 (E), and 2009 (F) growing seasons in Eatonton.



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