Results confirmed an advantage to planting cool season annual pasture into a prepared seedbed as opposed to sod-seeding into dormant bahiagrass. Results also indicated a small advantage in planting a mix of forage species (i.e., oats and ryegrass) vs a single species (i.e., ryegrass).

SUMMARY
A 2-yr study was done to evaluate two annual cool season forage treatments [ryegrass + oats (ORG) vs ryegrass only (RG)] and two pasture planting/cultivation methods [prepared seedbed (PS) and sod-seeding (SS) into dormant bahiagrass]. Eight, 3.2 acre pastures were utilized during the 2003-04 and 2004-05 winter/spring-grazing seasons. The PS pastures were planted in October into clean-tilled seedbeds and the SS were planted with a no-till seed drill in November when bahiagrass (Paspalum notatum Flugge) became dormant. The pastures were grazed by growing beef heifers (average initial weight of 631 and 550 lb for Yr 1 and 2, respectively). The grazing season ended in April ('04) and May ('05). The average number of animal grazing d/acre/yr was 194, 154, 139, and 124 for PS-ORG, PS-RG, SS-ORG, and SS-RG treatments, respectively. Average forage dry matter (DM) yield (lb/acre/yr) was 4,124; 3,293; 3,118; and 2,995; average daily gain (lb/day) of test cow was 2.31, 2.51, 2.20, and 2.42; and estimated cattle weight gain (lb/acre/yr) was 441, 375, 287, and 291 for the above treatments, respectively. Pasture cultivation/planting method affected grazing days (P=0.01), pasture forage DM yield (P=0.03), and total gain (P=0.01), but not average daily gain (ADG; P>0.10). Utilization of a forage mixture vs a mono-crop increased grazing days (P=0.07) and forage DM yield (P=0.08), but ADG was decreased (P=0.04); total cattle weight gain/acre was unaffected (P>0.10).

INTRODUCTION
The planting of cool season annuals, such as ryegrass, oats, rye, and (or) wheat, is common in the Coastal Plain region of the southeastern USA to provide grazing for beef cattle during the winter-spring season (usually from November to May). The length of the grazing season and amount of pasture forage can be influenced by many factors other than weather. Some of these factors include: 1) forage species, 2) forage variety within species, 3) planting a single species (mono-crop) vs blend of forage species, 4) species used within forage blend, 5) pasture cultivation/planting method, 6) planting date, 7) fertility, and 8) dryland or irrigated management.

We previously noted an advantage of planting cool season annual pasture into a prepared seedbed (clean tilled) as opposed to sod-seeding into a dormant warm season pasture of bahiagrass. In that same study, we did not notice much effect of forage species blend used (small grains – rye and oats vs these small grains plus ryegrass; Myer and Blount, 2005). Most cool season pastures grown in the southeastern USA, however, are monocrops, mostly ryegrass. In theory, the use of a blend of cool season annuals should result in a longer grazing season than a mono-culture. We did not fully address the lack of adequate forage on the PS pasture plantings and the forage types (ORG or RG) were planted using a grain drill. Pastures that included the SS procedure, a no-till seed drill was utilized and the forage types (ORG or RG) were planted into dormant ‘Argentine’ bahiagrass. Recommended (UF/IFAS) seeding rates were used and initial fertilization and rates were based on soil analysis. Within year, the PS pastures were planted during October and the SS pastures during November or December when bahiagrass which occurred during November of each year. Grazing was started when the forage was about 8 to 12 inches in height within pasture. Grazing was continued until there was a lack of adequate forage on the PS pastures; grazing of the SS pastures was terminated within year upon termination of the last PS pasture. All pastures over both years were grown under dryland conditions. All pastures were top dressed twice with nitrogen fertilizer, each time with 75 lb of N/acre.

For each year, 32 growing Brangus, Brangus x Angus, and Angus x Hereford heifers were used (average initial weight of 631 and 550 lb for yr 1 and 2, respectively). The animals were allotted equally within each of the two replicates.
into groups of four based on initial weight and genetic background. Pasture treatment was assigned at random to the groups within replicate. All cattle were allotted to the treatment groups upon initiation of grazing of the first pasture. The groups whose pastures were not ready were fed bermudagrass hay and supplement (80% ground corn and 20% cottonseed meal mix). When each pasture was ready, the cattle assigned to that pasture were weighed, moved to the pasture, and the experimental grazing period started. While grazing the experimental pastures, the cattle were weighed every 28 d as well as at the end of the grazing periods. All weights were taken after an overnight fast. The four cattle allotted to each pasture each year were known as “tester” cattle. “Put and take” cattle (extra cattle from the same calf crop as the “testers”) were utilized when available forage in the pastures was greater than the “tester” cattle could graze. The number and days the “put and take” cattle used for each pasture were recorded.

Forage samples were collected from ungrazed areas in each pasture to estimate forage dry matter yield (DMY), and to determine crude protein (CP) and in vitro dry matter digestibility (IVOMD).

Data collected included weight gain of the “tester” cattle, animal grazing days (“tester” plus “put and take” cattle), estimated pasture forage DMY, and pasture forage quality (CP, IVOMD). Data were analyzed as a 2 x 2 factorial design combined over years. The main effects evaluated included pasture forage type and pasture planting/cultivation method.

**Results**

For each year, we were able to graze the PS pastures sooner than the SS pastures (Table 1). We were also able to start grazing sooner for the ORG forage blend pastures than the mono-crop RG pastures for the second year but not the first year. We noted a large year effect in that the grazing season was overall much shorter for yr 1 than for yr 2. This difference was the result of late planting for yr 1, due to dry conditions, and to the late start of the grazing period for all treatments because of unusually cold and dry conditions that occurred during the November through January period of that year. The grazing period also was ended sooner for yr 1 than planned because of dry conditions. During yr 2, the weather conditions were more favorable thus we were able to graze sooner and the grazing period lasted well into May. However in yr 2, we had to temporarily take the cattle off of two pastures (the second replicate of the PS pastures) for two wk during January because of a lack of forage due to cool growing conditions. The cattle were given hay and supplement during this two-wk period. The weight gain and grazing days were adjusted for final results for these two groups.

The differences in weather conditions noted above between the two years of the study resulted in differences between the years in regards to most of the parameters measured (i.e., animal grazing days, pasture forage DM yield, cattle weight gain per acre). However, no meaningful year by treatment interactions (P>0.10) were noted, therefore the results were combined and averaged over the two years.

Even though the SS pastures were planted 20 d later than the PS pastures, grazing did not start until an average of 42 d after the start of grazing of the PS pastures (averaged over both years; Table 1). Thus, average length of grazing was greater (P=0.01) for PS pastures compared to the SS pastures (Table 2). Planting pastures with a blend of oats and ryegrass resulted in an overall slightly longer (P=0.07) grazing season than pastures seeded with ryegrass alone (Table 2). This latter finding might have been greater if weather conditions and rainfall for Yr 1 were not so harsh and closer to “normal”.

Estimated forage DMY of the PS pastures averaged 19% greater over both grazing seasons than that noted for the SS pastures (P=0.03; Table 2). This increase was less than the 48% obtained in our previous study of similar design (Myer and Blount, 2005). Month of grazing season greatly influenced (P<0.01) pasture forage DMY (Figures 1a and 1b). The PS pastures had greater DMY earlier in the grazing periods than the SS pastures, primarily due to their earlier start, but by March and continuing through April, the yields were similar (Figure 1a). However, during May, DMY of the SS pastures were actually greater than the PS pastures. This increase may be due in part to the emerging warm season bahiagrass in the pastures. The ORG blended pastures tended, on average, to have greater DMY (P=0.08) over the duration of the grazing season than the RG only pastures (Table 2). During the early months, ORG pastures tended to have greater yields than the RG pastures (Figure 1b). During April the yields were similar, and by May the RG only pastures yielded slightly more than the ORG pastures.

Total number of cattle grazing days for the PS pastures averaged 33% greater than for the SS pastures (P=0.01; Table 2). Cattle grazing days are a combination of the grazing days of the “tester” and “put and take” cattle. Average stocking density, however, was less (P=0.01) for the PS pastures as compared to the SS pastures (Table 2). This may have been the result of the longer period of time that the PS pastures were grazed during the coolest time of the year (November through February) where forage growth is limited. Estimated total cattle weight gain per acre of pasture, as expected, was greater (P<0.01) for the PS pastures than the SS pastures (Table 2). While the ORG pastures produced greater forage DMY and more cattle grazing days than the RG only pastures as noted above, estimated cattle weight gain per acre was similar (P=0.10; Table 2). The reason for this was that cattle on the ORG pastures had a lower ADG (P=0.04; Table 2) than cattle on the RG only pastures.

The main reason for the increased pasture forage DMY and subsequently increased animal grazing days for the PS pastures was the longer grazing season for this cultivation method compared to SS as noted above. The longer season was due mainly to the earlier planting dates for the PS pastures (Table 1). Another reason may be the competitive effect of the bahiagrass. There is evidence from other studies that bahiagrass, even when dormant, can have a negative effect on the growth of a crop overseeded into this grass. The delay in peak forage DMY noted (Figure 1a) for the SS pastures may be the result of this competition. However, the longer
period between planting and grazing for the SS compared to PS pastures may be due more to the influence of the cooler weather on young plant growth than competition from the bahiagrass. As expected, both IVOMD and CP values of forage of pasture samples were quite high (Figures 2 and 3). Both IVOMD and CP values were not influenced (P>0.10) by pasture planting/cultivation method. The ORG pastures, however, tended to have a lower overall IVOMD value than the RG pastures (80 vs 82%; P=0.10; Figure 2a); CP was similar (P>0.10). Both IVOMD and CP values were affected by month (P<0.01; Figures 2 and 3). The values were greatest during the coolest months and lowest late in the grazing season. The slightly lower IVOMD for the ORG forage compared to the RG, may have contributed to the lower ADG for cattle grazing the ORG pastures vs cattle that grazed the RG pastures.

**CONCLUSION**

The results of this two-yr study further confirm that cool season annual pasture planting/cultivation method can impact the length of the grazing season, the number of cattle grazing days, and total pasture forage DM yield over the winter-spring grazing season. These effects consequently affected total cattle weight gain per unit of land area over the total grazing season. The planting of a blend of oats and ryegrass as the pasture forage, as opposed to planting ryegrass alone, also affected the length of the grazing season, season, number of cattle grazing days, and pasture forage yield but not to the extent as pasture planting/cultivation method did. None-the-less, the grazing season was lengthened by using a blend vs a monocrop; however, in our present study, total estimated cattle weight gain per acre of pasture was not improved.

**LITERATURE CITED**


1Part of project Qun-03854; fertilizer and lime used was paid for by Orange Hill Soil Conservation District, Chipley, FL.

2The assistance of Harvey Standland, Jeff Jones, Todd Matthews, Rory Croft, John Crawford, Richard Fethiere, Mary Chambliss, and Tina Gwin is gratefully acknowledged.

3Bob Myer, Professor; Ann Blount, Associate Professor; UF/IFAS, North Florida Research and Education Center, Marianna, FL.

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**Table 1. Experimental grazing periods.**

<table>
<thead>
<tr>
<th>Treatmenta</th>
<th>Planting date</th>
<th>Grazing start</th>
<th>Grazing end</th>
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<tr>
<td></td>
<td>Yr 1</td>
<td>Yr 2</td>
<td>Yr 1</td>
</tr>
<tr>
<td>PS ORG</td>
<td>31 Oct</td>
<td>12 Oct</td>
<td>13 Feb</td>
</tr>
<tr>
<td>PS RG</td>
<td>31 Oct</td>
<td>12 Oct</td>
<td>13 Feb</td>
</tr>
<tr>
<td>SS ORG</td>
<td>17 Nov</td>
<td>2 Nov</td>
<td>12 Mar</td>
</tr>
<tr>
<td>SS RG</td>
<td>17 Nov</td>
<td>2 Nov</td>
<td>12 Mar</td>
</tr>
</tbody>
</table>

aPS=prepared seedbed; SS=sod-seeded; ORG=oats and ryegrass; and RG=ryegrass only.

**Table 2. Main effects of pasture cultivation/planting method and pasture forage blend on pasture forage yield and growth performance of growing beef cattle heifers.**

<table>
<thead>
<tr>
<th>Item</th>
<th>Cultivation method</th>
<th>Forage blend</th>
<th>Significance1</th>
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</thead>
<tbody>
<tr>
<td></td>
<td>PSa</td>
<td>SSb</td>
<td>ORGc</td>
</tr>
<tr>
<td>Forage DMY, lb/acre</td>
<td>3,636</td>
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<td>Grazing season length, d</td>
<td>115</td>
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<td>Cattle grazing d/acre</td>
<td>174</td>
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<td>167</td>
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<tr>
<td>Avg. daily cattle wt gain, lb/d</td>
<td>2.42</td>
<td>2.31</td>
<td>2.24</td>
</tr>
<tr>
<td>Stocking rate, head/acre</td>
<td>1.5</td>
<td>1.7</td>
<td>1.7</td>
</tr>
<tr>
<td>Estimated cattle wt gain, lb/acre</td>
<td>407</td>
<td>289</td>
<td>364</td>
</tr>
</tbody>
</table>

aPS=prepared seedbed.
bSS=sod-seeded.
cORG=oats and ryegrass mix.
dRG=ryegrass only.
eStandard error of the mean; n=8.

1Key: **=highly significant difference (P<0.01), *=significant difference (P<0.05), +=slight significant difference (P<0.10), and NS=non-significant difference (P>0.10).

Cult=pasture cultivation/planting method (PS vs SS).

For=forage blend (mono vs blend).

CxF=cultivation/planting method by forage blend interaction.
**Figure 1a.** Effect of pasture cultivation/planting method on monthly pasture forage DMY during the grazing periods, lb/acre (averaged over both years; effect of month, P<0.01; PS vs. SS, P=0.03).

**Figure 1b.** Effect of pasture forage blend on monthly pasture forage DMY, lb/acre (averaged over both years; effect of month, P<0.01; ORG vs. RG, P=0.08).
Figure 2a. Effect of pasture cultivation/planting method on pasture forage IVOMD, % (averaged over both years; effect of month, P<0.01; PS vs. SS, P>0.10).

Figure 2b. Effect of pasture forage blend on pasture forage IVOMD, % (averaged over both years; effect of month, P<0.01; ORG vs. RG, P=0.10).
Figure 3. Average pasture forage CP, % (averaged across all treatments and over both years; effect of month, P<0.01, ORG vs RG, P>0.10; PS vs SS, P>0.10).a

*aPS = prepared seedbed; SS = sod-seeded, ORG = oats and ryegrass mix, and RG = ryegrass.