

GRAZING ALFALFA AT THE WESTERN KENTUCKY UNIVERSITY FARM

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Alfalfa has been around for centuries. In all this time, it was used in many different ways to provide high quality forage to livestock. In fact, in the area where alfalfa originated, the word actually means "horse power". We have come a long way since then and alfalfa is used for a wide range of animals, from rabbits to rhinos.

In order to maximize the efficiency of utilization of alfalfa, it has become necessary to graze it. Grazing is preferred over harvesting and storage for several reasons: less equipment and thus lower cost, less harvest loss, and greater quality forage because of retained leaves. These benefits are well known and they attract many producers to intensify their grazing to reap the benefits.

However, grazing alfalfa is not without its drawbacks:

- Bloat
- Lower persistence of stand due to destruction of crown buds etc.
- Cost of grazing tolerant alfalfa seed compared to hay-type varieties
- Some concern that yield may be lower than hay-type varieties

Despite the fact that there were dozens of alfalfa varieties available to producers, they were not particularly tolerant to or very productive under grazing management. This fact led Dr. Joe Bouton and his team at the University of Georgia to develop what is probably the most popular grazing-tolerant alfalfa variety – AlfaGraze. Since then, many more "grazing tolerant" varieties have been developed and released by several companies. These grazing tolerant varieties have proven to be useful in a number of different management situations. Improved tolerance and survival under grazing pressure is greatly influenced by traits such as creeping rootedness, deep-set crowns, rapid regrowth, and continuous accumulation of root carbohydrate reserves even during defoliation.

We undertook this study at the WKU Agricultural Research and Education Complex (AREC) with a two-pronged objective; however, only one objective was measurable. First, we wanted to incorporate this incredibly versatile forage into our forage-livestock system and continue with our aggressive forage management regime. Secondly, with so many grazing tolerant varieties on the market, we wanted to evaluate

several commercially available varieties to see how they would perform under the conditions of grazing management we imposed on them and see which would be best in a similar management situation.

VARIETIES USED:

The varieties used all performed well in the University of Kentucky's Alfalfa Variety Trials in which yield is determined by mechanical harvesting. However, it is well-known that mechanical harvesting and simulated grazing do not sufficiently reflect the complexity of the effects of actual livestock grazing a forage stand.

The varieties we chose were:

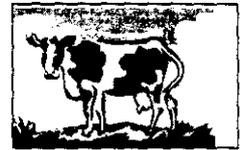
- Southern States GrazeKing
- WL-325HQ
- WL-324
- Garst 645II
- ABT405
- SpredorIII

CROP ESTABLISHMENT AND FIRST YEAR MANAGEMENT:

All varieties were seeded in a prepared seedbed on March 29, 2000 at a rate of 25 lbs/acre. The field was limed (100 lbs/acre) and fertilized (4lbs/acre boron and 150 lbs/acre diammonium phosphate) prior to planting. The layout of the field is illustrated in Figure 1.

Figure 1

Dairy



Mixed alfalfa (all 6 varieties) in sinkhole area (not part of study area)	SPREDOR 3 (6)
	ABT 405 (5)
	WL 325 HQ (4)
	GARST 645 II (3)
SOUTHERN STATES GRAZE KING (1)	WL 324 (2)



In the first year we harvested hay three times but did not graze. Our plan for a fourth harvest was abandoned due to the unseasonably warm weather that persisted into November. We did not want to run the risk of taking a fourth harvest and then have the crop starting to regrow because it would use up valuable stored resources that are supposed to be stored for spring regrowth.

SECOND YEAR MANAGEMENT (GRAZING PLAN):

Each paddock was approximately ½ acre in size. The layout as outlined in figure 1 was made possible by the use of poly wire, plastic step posts and metal pig-tailed step posts. Grazing commenced on April 16, 2000 with 20 dairy cows, 10 Holstein and 10 Jerseys. This was done to harvest the forage as quickly as possible so we would not be faced with paddocks with forage that was too mature and low in quality. After the first grazing cycle, we reduced the herd size to 12 cows, 4 Holsteins and 8 Jerseys, and it remained that way through the subsequent 6 rotations. The final grazing after frost was accomplished with approximately 50 lactating dairy cows grazing each paddock for 2 days.

How did we handle the animals?

The animals used were all lactating dairy cows. They were fed a TMR of 20 lbs of grain, 12 lbs of alfalfa hay, and 20 grams of Bloatguard® per day. The animals were fed after the morning milking and allowed to eat for 45 minutes to 1 hour before being put on pasture at approximately 8:00 am. The animals were taken off pasture at approximately 11:30 am and returned following the afternoon milking (approximately 4:00 pm) for another 3-4 hours. This regime significantly reduced the incidence of bloat because we were feeding Bloatguard® and not allowing them to get on the alfalfa pasture hungry. We also provide them with Sweetlix® Bloatguard® blocks near their feeding bunks.

We had 2 cows that were apparently very susceptible to bloat and would bloat frequently. Fortunately, their bloating was usually quickly detected and actions taken to prevent further development of the problem. It is suggested that if you have cows that are chronic bloaters they should be watched carefully or not be allowed to graze alfalfa.

When did we graze and for how long?

Each plot was grazed when the forage reached a minimum height of 14 inches (typically all plots were at early bloom at this height). Before each plot was grazed it was sampled to determine yield and a stand count done at the spot where the sample was taken. We took four samples and stand count in each paddock to ensure that we got a representative sample. The grazing period ranged from 2-5 days but as a general rule, the animals were removed and placed on another paddock when the forage height reached approximately 4 inches.

How long was the rest period?

Rainfall seems to have come at exactly the right time on each occasion in 2001. Rest periods ranged from 16-34 days, with an average of 22 days (Table 1). With six paddocks and a sacrifice area, we were able to maintain a very good rotation as well as keep the animals off the paddocks after very heavy rainfall. It is important to reserve a "sacrifice" area for holding the animals after heavy rainfall, or in the event that your rotation gets thrown off due to slow regrowth.

In 2000 when we harvested for hay, the average harvest intervals were much longer, approximately 30 days. Of course, we all remember how dry South Central Kentucky has been over the last 3 years.

Table 1. Rest periods between grazing in 2001

Variety	Grazing Period				
	1	2	3	4	5
	Days rest after each Grazing				
Southern States GrazeKing	21	21	18	23	24
WL 324	18	2	16	23	29
Garst 645II	20	20	18	25	27
WL 325HQ	23	18	17	25	27
ABT 405	34	17	19	23	24
SpredorIII	27	18	19	28	24

What were we looking for?

We were interested in measuring yield and number of plants/sq. ft. After two years (one year of grazing), all varieties are in relatively very good shape with an average of 7 plants/sq. ft. Table 2 shows the stand count and yield for the six varieties in 2001. There was no statistical difference in yield among the varieties. As far as stand count, Southern States' GrazeKing and ABT 405 performed best (9 & 8 plants/sq. ft, respectively), followed by WL 324, Garst 645II, and WL 325HQ (all averaged 7.5 plants/sq.ft). SpredorIII had 6 plants per square foot at the end of the season. It is important that I emphasize that 6 plants per square foot can produce adequate forage. Also, this is only after one year of grazing. The differences were not remarkable this year, however, after another 2 or 3 more years of grazing we expect to see some separation in the performance of the varieties.

On average, there was a decline in stand count of 52% over the season. This is similar to other reported results of approximately 50% decline in alfalfa stand each year.

Variety	Stand count (plants/sq. ft)	Yield (tons/acre)
Southern States GrazeKing	9.0	1.6
WL 324	7.5	1.8
Garst 645II	7.5	2.4
WL 325HQ	7.5	2.0
ABT 405	8.0	2.0
SpreadorIII	6.0	2.0

Did the animals perform better on the alfalfa?

Cows on grazing alfalfa averaged 58 lbs of milk (4% fat corrected milk) per day and that production was comparable to the rest of the herd over the period of the study. The rest of the herd were fed 80 lbs of TMR (50% concentrate on a dry matter basis) and grazed rye, ryegrass, and sudangrass.

Animal behavior.

We noticed that each time the cows were turned onto a new paddock they would graze the top few inches of the entire paddock first and then graze the rest of the plant. This behavior substantiated the need to pay special attention to the animals when they are first placed on a new paddock to look out for possible bloat problems.

A preference for certain varieties was also observed. The animals would graze certain varieties down to the desired grazing height rapidly and on other plots we had to keep them on longer to achieve the same results.

Are we satisfied with grazing alfalfa?

We are very satisfied with the results we have gotten so far. It is our intention to put in more acreage in alfalfa for grazing the dairy herd. We believe it will be an excellent way of reducing feed cost and costs associated with feeding stored forage.

Acknowledgement

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