The Production of Rotationally Grazed Pasture in Jefferson County

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This fact sheet describes the results of a grant from SARE - Northeast Region to William W. Grantham, T. Neill Banks, Michael Boyd and Dr. O. C. Stine.

This fact sheet is based on three years of work by four livestock producers in Jefferson County West Virginia. The county lies in the northern end of the Shennadoah Valley. This area is prone to rain shadows from the Appalachian and the Blueridge Mountain Ranges. This has lead in the past to a reliance on row crop production for feed and continuous grazing versus the use of rotational grazing. These long time traditions have discounted the use of pasture as a provider of adequate amounts of high quality forage. This fact sheet will discuss the potential dry matter yield for three types of pasture\meadow grown in this area of West Virginia. A total of sixty eight grazing events (cattle moved in and then out of a field) were recorded. Using a pasture plate, 30 samples were taken before and after the livestock were in the field. Dry matter yield was evaluated by measuring the forage canopy height when depressed with an acrylic plate meter (TRIM Fact Sheet 5022 - "An Acrylic Plastic Weight Plate for Estimating Forage Yield"). The samples were divided into three classes of pasture: Tall Grass\Alfalfa, Tall Grass\Clover and Blugrass\Clover.

Pasture Growth \Carrying Capacity

Over the three-year period of this study, the region experienced below average rainfall and above average temperatures. Table 1 summarizes the precipitation data. Table 2 summarizes the temperature data collected.

Table 1: Precipitation 1997 - 1999

Farm	Mike Boyd	Bill Grantham	Dr. Oscar Stine	Neill Banks	Charles Town Average	Four Farm Average	Difference
April	1.62	2.89	2.82	3.04	3.23	2.59	- .64
May	1.58	2.2	2.14	2.48	3.81	2.10	- 1.71
June	1.25	2.75	3.10	2.92	3.53	2.51	- 1.02
July	2.12	3.22	2.96	3.59	3.77	2.97	- .8
August	.97	2.03	2.31	2.24	3.76	1.89	- 1.87
September	3.3	3.75	4.56	5	3.35	4.15	+ .8
October	1.76	1.38	1.59	1.05	3.38	1.44	- 1.94
Average	1.80	2.6	2.78	2.90	3.55	2.52	******

Table 2: Temperature 1997 - 1999

Farm	Mike Boyd	Bill Grantham	Dr. Oscar Stine	Neill Banks	Charles Town Average	Four Farm Average	Difference
April	56.6	55.6	56.6	55.6	53.8	56.1	+2.3
May	65.7	64.9	65.7	65.1	62.0	65.3	+3.3
June	71.6	71.0	70.9	71.0	69.0	71.1	+2.1
July	78.0	77.5	77.3	77.1	75.0	77.5	+2.5
August	74.7	74.1	74.3	74.0	74.0	71.9	- 2.1
September	67.5	68.9	68.9	67.7	67.0	68.7	+1.7
October	56.1	54.6	55.3	56.0	56.0	55.0	- 1.0
Average	65.4	66.3	67.0	65.3	65.3	66.5	******

The Charles Town averages are taken from a National Weather Service Observer, Mr. Lawrence Lloyd, with over 60 years of data. This data was used to evaluate the three years of this study.

These grass\legume mixtures on these four farms preformed at the levels expressed in Table 3.

Table 3: Monthly Growth Rate and Carrying Capacity

	Growth Rate Pounds per Acre per Day			Carrying Capacity Acres per Cow		
	Tall Grass \ Alfalfa	Tall Grass \Clover	Bluegrass \Clover	Tall Grass \ Alfalfa	Tall Grass \Clover	Bluegrass \Clover
May	21.2	60.0	55.2	1.4	.5	.5
June	52.1	31.8	30.7	.6	.9	1.0
July	34.3	30.5	45.6	.9	1.0	.7
August	33.9	34.6	20.7	.9	.9	1.5
September	32.2	48.4	55.0	.9	.6	.5
October	31.7	56.4	14.9	.9	.5	2.0
Average	34.2	43.6	37.0	.9	.7	1.0

The table demonstrates that a conservative estimate over the last three years (1997 - 1999) would be to plan for one cow or animal unit per acre during the growing season for grazing purposes. The tall grass\clover mixture had a faster average growth rate than the two other mixtures

There are differences between forage combinations. These differences can be seen between figures one, two and three. Figure four graphically demonstrates the relationship between precipitation and forage production. Figure five demonstrates the influence of temperature on these cool season grasses.

Figure 1

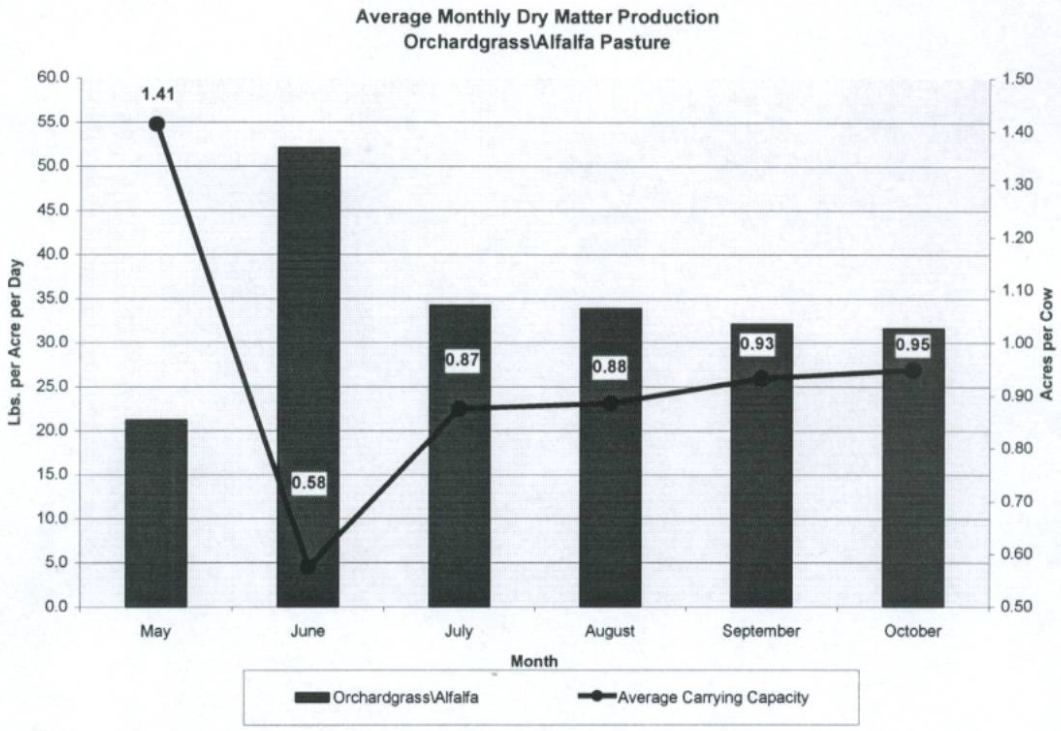


Figure 2

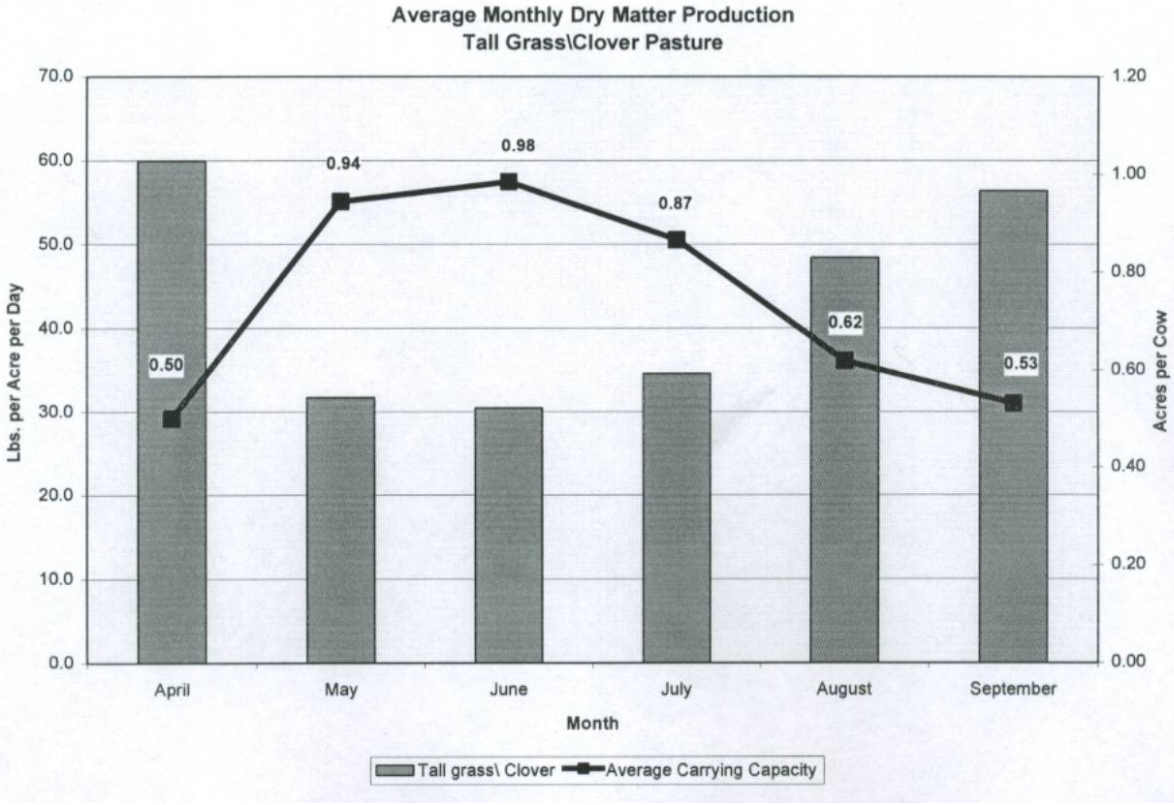
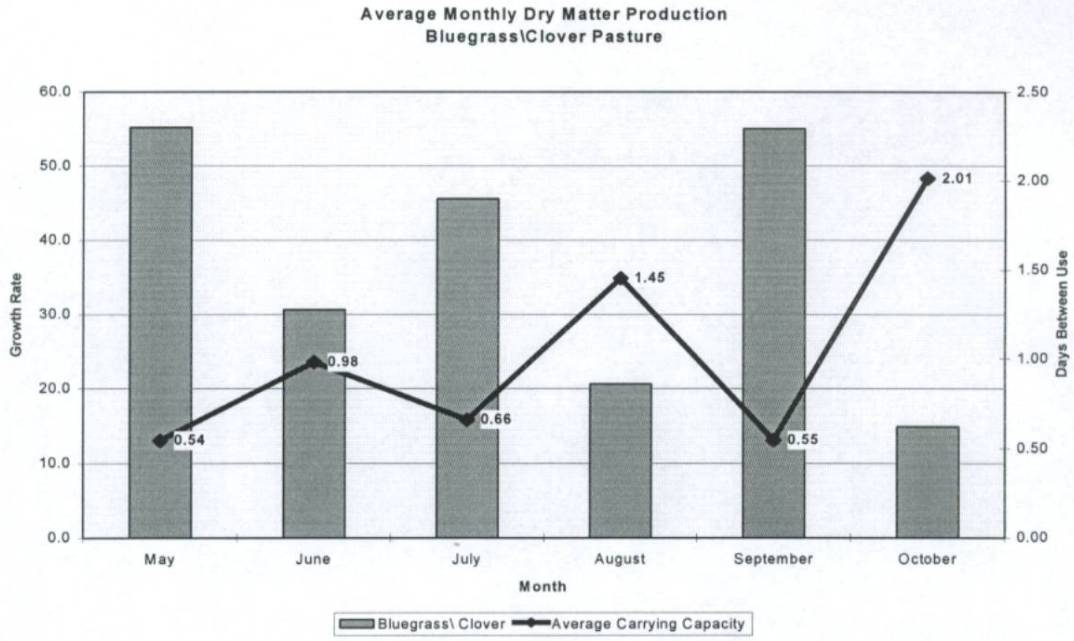


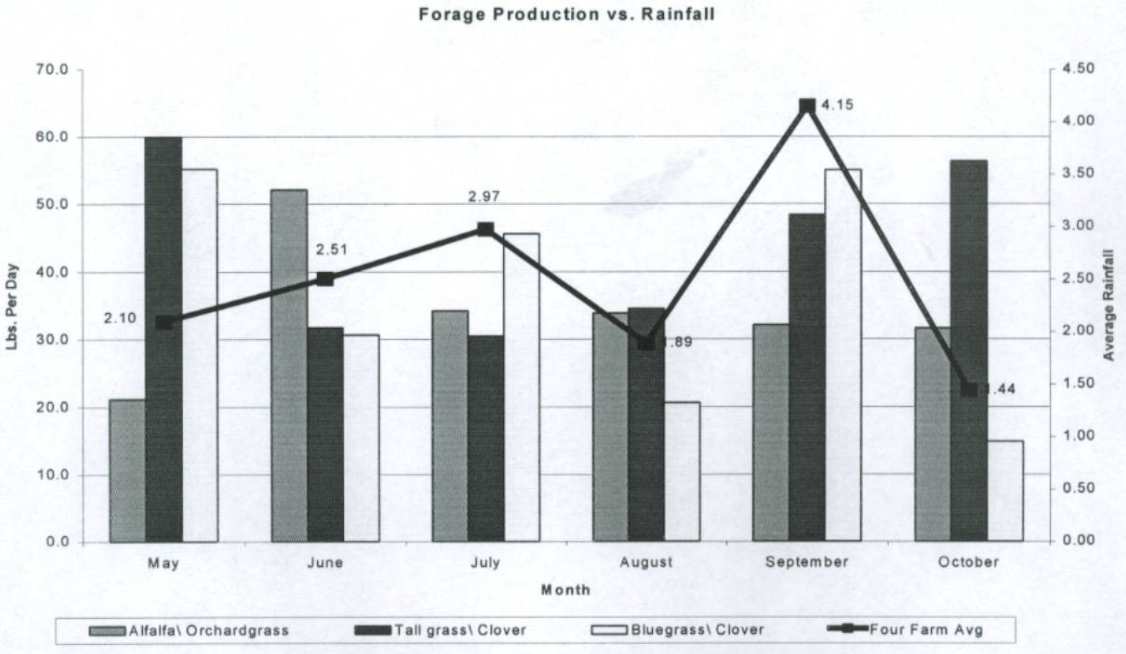
Figure 3



Bluegrass is a cool season grass. The unusually high production in July is attributed to a warm season grass (possibly nimbleweed) which encroached into the bluegrass stand.

These three graphs demonstrate the variability among species in production. They also demonstrate how different species respond during the growing season.

Figure 4



Precipitation had some affect on the production of the tall grass\clover. It most notably affected the growth bluegrass\clover mixture. The tall grass-alfalfa mixture was less affected. This may be due to the fact that alfalfa is deep rooted.

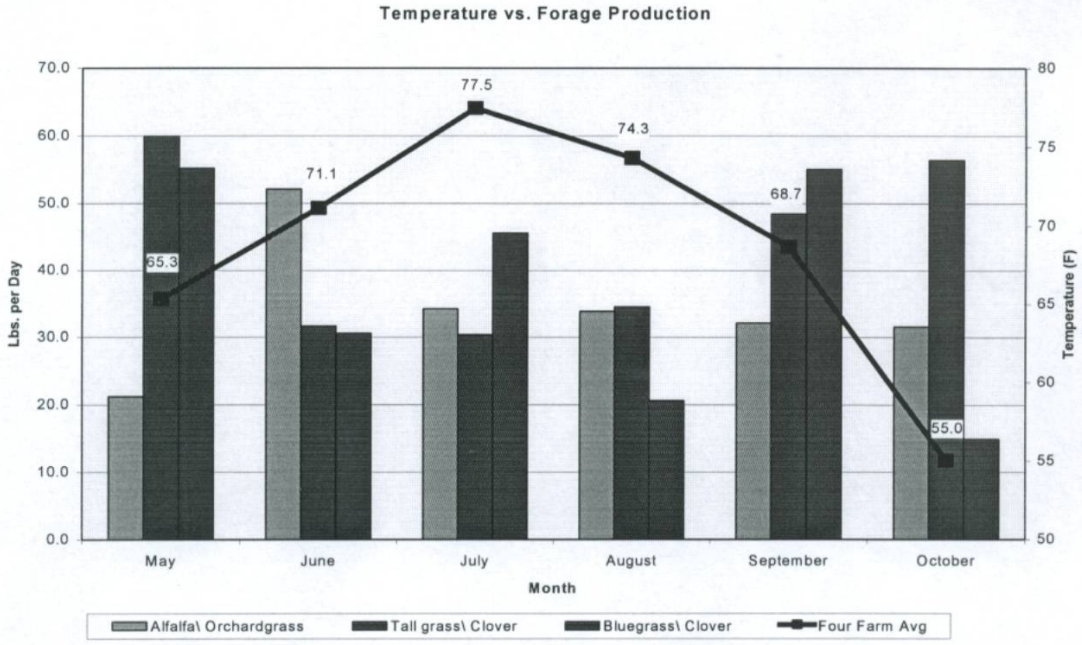


Figure 5

The same forage mixtures were affected by temperature with the bluegrass\clover mixture being the most affected by higher temperatures.

Summary

Pastures and meadows in the Northern Shennadoah Valley produce, on average of 38 pounds of dry matter per day during the growing season. This would provide forage for a little over one animal unit per acre for grazing purposes. Tall grass\clover mixtures have the greatest overall growth rate per day. The production per day has the potential to be greater if normal rainfall is received. Dry matter production is influenced by precipitation for the grass\clover mixes more than the grass\alfalfa mixes.

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