# NATURAL RESOURCES CONSERVATION SERVICE
# VIRGINIA TECHNICAL NOTE

## Agronomy - Forages/Pasture and Hayland Management #3

## COMPLETING A FORAGE SUPPLY AND DEMAND INVENTORY

Completing a forage supply and demand inventory involves consideration of all grazing system components. Total pasture and hay forage yields depend on soils, forage type, weather, and management. Supply changes over the year due to weather, forage growth curves, and management (stockpiling). Demand is based on the kind, class, and number of animals. Demand also changes over the year due to calving (lactation, body condition score changes), growth (stockers, replacement heifers), and changing numbers (culling, weaning, sales).

### ANIMAL UNITS - COMPARING SUPPLY AND DEMAND

Just as "dry matter" is a useful way to compare forages, an "animal unit" is a useful way to compare forage supply and demand. An animal unit is an amount of forage either supplied or demanded. The amount of forage in an animal unit, whether an animal unit day, month or year, depends on intake expressed as a percent of body weight.

Table 1. Guidelines for Determining Forage Consumption as % of Body Weight.

| Animal Type | Dry Matter Consumed as % of Body Weight |
|---|---|
| growing animals | 2 - 3% |
| finishing animals | 2 - 2.5% |
| beef brood cows | |
| lactating | 2.5 - 3% |
| dry | 2 - 2.5% |
| herd bulls | |
| excellent condition, mature | 1.5 - 2% |
| young or thin | 3 - 4% |
| dairy cows | |
| lactating | 3 - 4% [1/] |
| dry | 2.5 - 3.5% |
| dairy heifers | 3% |

[1/] This figure will be lower if a substantial part of the cow's diet is provided from a source other than grazing, for example, silage, alfalfa hay, or grain in the parlor.

A common animal unit reference is a 1,000 pound dry cow that is not gaining weight. If the cow is heavier, lactating, or gaining, she is over one animal unit.

Different kinds and classes of animals have different animal unit equivalents depending on their size, growth rate, and physiological state (dry or lactating).

Table 2. Suggested Animal Unit Equivalents for Various Livestock.

| Kind and Class of Livestock | Animal Unit Equivalents |
|---|---|
| **Beef Cattle** | |
| Mature Bull (≥ 24 mo. & over, 1,700 lbs) | 1.5 |
| Young Bull (18-24 mo., 1,150 ave wt.) | 1.15 |
| Cow & Calf Pair | 1.35 |
| Mature non lactating, non gaining cow, 1,000 lbs | 1.0 |
| Pregnant heifer, nonlactating, (18+ mo old) | 1.0 |
| Yearlings (18-24 mo., 875 lbs ave) | 0.9 |
| Yearlings (15-18 mo., 750 lbs ave) | 0.8 |
| Yearlings (12-15 mo., 625 lbs ave) | 0.7 |
| Calves (weaning to 12 mos., 500 lb ave) | 0.6 |
| Calves (weaning at 8 mo., 450 lb ave) | 0.5 |
| **Dairy Cattle 1/** | |
| Holstein or Brown Swiss Bull | 1.9 |
| Holstein or Brown Swiss Cow | 1.5 |
| Holstein or Brown Swiss Heifer, 18 mo. | 1.0 |
| Guernsey or Ayrshire Bull | 1.5 |
| Guernsey or Ayrshire Cow | 1.2 |
| Guernsey or Ayrshire Heifer, 18 mo. | 0.8 |
| Jersey Bull | 1.3 |
| Jersey Cow | 1.0 |
| Dairy Beef (see beef yearlings above) | |
| Dairy Calves (see beef calves above) | |
| **Sheep and Goats** | |
| Ewe and Lamb pair | 0.3 |
| Doe and Kid Pair | 0.25 |
| Sheep, Mature, nonlactating | 0.2 |
| Goat, Mature, nonlactating | 0.2 |
| Weaned Lambs and Kids | 0.15 |
| **Equine** | |
| Draft Horse or Mule (mature) | 1.5 |
| Saddle Horse (mature) | 1.3 |
| Colt, under 2 yrs old | 0.5 |

1/ Animal units for lactating dairy cows are difficult to determine because of supplemental feeding, differences in genetic potential within herds and breeds to produce milk, and variations in dry matter intake as lactation cycle progresses. Values given are averages and will fluctuate widely.

## Definitions and Examples

**Animal Unit Day** - the amount an animal unit eats in one day.
If intake = 2.6% of body weight, then .026 x 1,000 = 26 lbs/day.

**Animal Unit Month** - the amount an animal unit eats in one month.
If intake = 2.6% of body weight, then .026 x 1,000 = 26 lbs/day x 365 days/yr = 9490 lbs/yr divided by 12 = 791 lbs/month.

**Animal Unit Year** - the amount an animal unit eats in one year.
If intake = 2.6% of body weight, then .026 x 1,000 = 26 lbs/day x 365 days/year = 9490 lbs/yr.

The following table lists various amounts of forage dry matter for animal unit days, months, and years based on intake expressed as a percent of body weight.

Table 3. Animal Unit Amounts.

| | **Animal Unit (lbs dry matter)** | | |
|---|---|---|---|
| **Percent Intake** | **Day** | **Month** | **Year** |
| 1.5 | 15 | 456 | 5475 |
| 2.0 | 20 | 608 | 7300 |
| 2.5 | 25 | 760 | 9125 |
| ***2.6*** | ***26*** | ***791*** | ***9490**** |
| 3.0 | 30 | 913 | 10950 |
| 3.5 | 35 | 1065 | 12775 |

*GLA uses 2.6% intake rate for calculating animal units for beef animals.

## Forage Supply

To determine forage supply, information is needed about the yield, distribution, and utilization rate of the forage.

### Yield

Forage yield depends on type of forage or forage mixtures, soils, and weather. Management has a direct affect on yield through fertility, stocking rates, and type of grazing system. Pasture forage yields are difficult to predict due to a lack of records and changing conditions but some information exists to refine the estimate.

A. Farmer Records

While pasture yields are almost never recorded, most producers have information on hay yields. Hay fields often receive better management than pastures and, consequently, almost always exceed pasture yields. If hay yields for a given soil type are known, this can be used as a base for estimating pasture yields. Some estimate pasture yields to be around 70% of hay yields. However, take into account the level of pasture management when adjusting hay yields because well managed pastures may exceed hay yields.

B. Field visit

Farm visits are the best way to estimate pasture forage yield. The level of management can be determined by the appearance of the forages, livestock, and infrastructure (fence location, water sources and locations, and handling

facilities). If the forage is extremely short, manure piles are easily visible (no growth of forages around the manure pile), a heavy weed infestation, and lots of bare areas, then yield is low, probably due to over stocking. Over stocked pastures have a negative affect on all grazing system components (soils, plants, animals, and producer goals).

A lack of legumes may indicate low pH, phosphorus and potassium deficiency, and/or a lack of proper rotation. If the forage around the manure is very green in contrast to the rest of the field, lack of fertility may be an issue. The presence of significant amounts of broomsedge may indicate a low pH and/or low phosphorus.

C. Soil Survey

Soil surveys give an estimate of forage yields (hay and pasture) for different soils. Often, the pasture yield is expressed as "cow-calf days". It may be difficult to determine the amount of yield unless the amount of forage associated with this term is known. As discussed above, the amount varies with percent intake and the percent intake varies with type of animal and its growth or lactation stage.

D. "VALUES"

The "Virginia Agricultural Land Use and Evaluation System" gives a yield estimate for various soils. "VALUES" was designed to assist with realistic yield estimates to avoid over fertilizing which increased the chance of water contamination. Again, pasture yields are given as animal units which may be confusing unless the amount of forage associated is known.

E. Variety Trials

Variety trials give some indication of forage yield for hay but it must be remembered that the trials are under a very high level of management. Try to use variety trials that are the closest to your location.

F. The following forage yield table may be used as a starting point. However, it is the least desirable source as it does not take into account location, soil, and management differences.

Table 4. Forage Yield Estimates.

| Forage(s) | Estimated Ave Yield(lbs dm/ac/yr) | |
|---|---|---|
| | pasture | hay yield range |
| Alfalfa | 8000 | 6000 - 12000 |
| Bermudagrass (Common) | 7000 | |
| Bermudagrass (Common) + Rye | 11000 | |
| Bermudagrass (Hybrid) | 9000 | 8000 - 16000 |
| Bermudagrass (Hybrid) + Rye | 13000 | |
| Birdsfoot Trefoil | 4000 | |
| Bluegrass | 4000 | |
| Bluegrass + White Clover | 4500 | |
| Bluestem, Big | 7000 | 6000 - 10000 |
| Bluestem, Caucasian | 7000 | 6000 - 10000 |
| Crabgrass | 7000 | |
| Eastern Gamagrass | 7500 | 6000 - 14000 |
| Lespedeza, Annual | 3000 | 2000 - 4000 |
| Warm Season Annuals | 5000 - 8000 | |
| Orchardgrass | 6000 | 4000 - 10000 |
| Orchardgrass + Alfalfa | 7500 | 5000 - 11000 |
| Orchardgrass + Red Clover | 7000 | 5000 - 10000 |
| Orchardgrass + Ladino Clover | 6000 | |
| Rescuegrass 'Matua' | 6000 | 6000 - 12000 |
| Rye | 5000 | |
| Switchgrass | 7500 | 4000 - 10000 |
| Tall Fescue (EI & EF) | 7000 | 4000 - 12000 |
| Tall Fescue (EI & EF) + Red Clover | 7500 | 5000 - 12000 |
| Tall Fescue (EI & EF) + Ladino Clover | 7000 | |
| Timothy | 4000 | 2000 - 6000 |
| Wheat | 5000 | |

These estimates only provide a starting point in determining forage yield.

While pasture forage yields are difficult to determine, a knowledge of the soils and level of management will help determine a reasonable estimate. As each farm is different, a field visit and a discussion with the producer is important.

**Distribution**

Knowledge of forage distribution is necessary to minimize deficits, especially in the summer. Determining demand and supply by month provides information for better management decisions (species selection, stockpiling, timing of fertility, anticipated hay feeding times, and amount of hay needed).

Forage growth curves vary with species and location. Appendix 2 shows monthly estimates on the percent of growth for various species by Major Land Resource Areas (MLRAs). Appendix 1 shows MLRA locations for Virginia.

## Utilization Rate

Utilization rate refers to how much of the available forage is actually consumed by grazing livestock and is figured from a desired forage residual height, not from the ground. Utilization rate is greatly influenced by management.

Information useful for determining utilization rate is number of fields, rotation frequency, stocking rate, and distance to water.

Table 5. Rotational pasture estimated utilization rates.

| | Recovery Periods | | |
|---|---|---|---|
| | 20 Days | 40 Days | |
| Grazing Period (days) | Number of Paddocks | Number of Paddocks | % pasture utilization |
| 0.5 - 1 | 41 - 21 | 81 - 41 | 80 |
| 2 | 11 | 21 | 75 |
| 3 | 8 | 14 | 75 |
| 4 | 6 | 11 | 70 |
| 5 | 5 | 9 | 65 |
| 6 - 30 | 3 - 2 | 8 - 3 | 60 |

In general, the shorter the grazing period and longer the recovery period, the higher the utilization rate. Low utilization rates indicate under stocking and waste of forage. Utilization rates over 80% indicate overstocking and damage to all components of a grazing system (soils, forages, animals, and producer goals). Utilization rates can be calculated in the field.

**How to Calculate Utilization Rate**

Step 1.
A. Measure height of forages just before turn in (beginning of grazing period).
B. Measure height of forages just after turn out (end of grazing period).
C. Determine the desired residual height and available forage.

Example:
Beginning height = 8 inches
Desired residual (ending height) = 3 inches
Available forage = 5 inches (8 inches measured minus 3 inches to leave)
Actual ending height = 4.5 inches

Step 2.
8 inches beginning height minus 4.5 inches left = 3.5 inches eaten
3.5 inches eaten divided by 5 inches available = 70% utilization rate

## Forage Demand

Forage demand depends on the kind, class, size, and number of livestock. It is most often figured by using a percent of the animal's body weight. (See table on page 1.) Demand, like forages, changes over the year primarily due to growth, calving periods, weaning, and culling.

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## Completing an Inventory of Forage Supply and Demand

This note explains a spreadsheet program designed for this purpose.

### Information Needed

A. From the farm

1. Field identification (numbers, letters, etc.) on a map
2. Predominant forage/forage mixture in each field
3. Estimated yield of each field
4. Number of cows (not cows and calves) and their weight
5. Calving period
6. Number of bulls and their weight
7. Number of replacement heifers, if any, and their weight
8. Number of stockers (winter or spring), if any, and beginning/ending weights

B. From the technical note or worksheet

1. Pounds of forage per animal unit month (depends on percent intake)
2. Growth curve for forage/forage mixture
3. Animal unit equivalents for the livestock

The following worksheet shows the steps needed to complete an inventory.

Forage Inventory Technical Note.doc

Determining Supply Using the Spreadsheet

Step one

The pounds/animal unit is determined by the percent intake. If the percent intake is 2.6% of body weight, then the pounds/animal unit month is 790.8.

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Forage Supply and Demand Worksheet (AUM's)

Supply Worksheet

| | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Enter pounds dry matter per AUM | | | | 790.8 | | Note: if a zero is in this field, an error message enters all computed fields | | | | | | | A numerical entry corrects the error | | |
| | % Intake | | lbs/AUM | | % Intake | | lbs/AUM | | | | | | | | |
| | 1.0% = | | 304.2 | | 2.6% = | | 790.8 | | | | | | | | |
| | 1.5% = | | 456.3 | | 3.0% = | | 912.5 | | | | | | | | |
| | 2.0% = | | 608.3 | | 3.5% = | | 1064.6 | | | | | | | | |
| | 2.5% = | | 760.4 | | | | | | | | | | | | |

Step two

Based on the field visit, enter a growth curve (as decimals) for the predominant forage/forage mixture in the growth curve row.

For example, the growth curve for tall fescue in MLRA 128 is entered.

| | | | | January | February | March | April | May | June | July | August | September | October | November | December |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Enter growth curve % (decimal) | | | | 0.00 | 0.00 | 0.05 | 0.15 | 0.25 | 0.15 | 0.04 | 0.04 | 0.10 | 0.15 | 0.07 | 0.00 |

Step three

Enter field information such as forage, field number, estimated yield per acre, and the acres for each field.

The animal unit months for each month are calculated automatically.

| Forage(s) | Field No. | Yield/Acre | Acres | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| TF-EI | 1 | 6000 | 10.0 | 0.0 | 0.0 | 3.8 | 11.4 | 19.0 | 11.4 | 3.0 | 3.0 | 7.6 | 11.4 | 5.3 | 0.0 |
| TF-EI | 2 | 6000 | 20.0 | 0.0 | 0.0 | 7.6 | 22.8 | 37.9 | 22.8 | 6.1 | 6.1 | 15.2 | 22.8 | 10.6 | 0.0 |
| TF-EI | 3 | 5000 | 15.0 | 0.0 | 0.0 | 4.7 | 14.2 | 23.7 | 14.2 | 3.8 | 3.8 | 9.5 | 14.2 | 6.6 | 0.0 |

There are two more places for other growth curves if needed. For example, switchgrass growth curve for MLRA 128 is entered.

| | | | | January | February | March | April | May | June | July | August | September | October | November | December |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Enter growth curve % (decimal) | | | | 0.00 | 0.00 | 0.00 | 0.08 | 0.15 | 0.20 | 0.23 | 0.20 | 0.14 | 0.00 | 0.00 | 0.00 |
| Forage(s) | Field No. | Yield/Acre | Acres | | | | | | | | | | | | |
| SWITCH | 4 | 6000 | 10.0 | 0.0 | 0.0 | 0.0 | 6.1 | 11.4 | 15.2 | 17.5 | 15.2 | 10.6 | 0.0 | 0.0 | 0.0 |
| | | | | January | February | March | April | May | June | July | August | September | October | November | December |
| Enter growth curve % (decimal) | | | | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Forage(s) | Field No. | Yield/Acre | Acres | | | | | | | | | | | | |
| | | | | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |

All entries are totaled in the subtotal row ( for all growth curves used).

| | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Subtotal for ALL fields in AUM's | | | | 0.0 | 0.0 | 16.1 | 54.4 | 92.0 | 63.5 | 30.3 | 28.1 | 42.9 | 48.4 | 22.6 | 0.0 |

Step four

Enter utilization rate adjustment (decimal)

| | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Enter utilization rate adjustment (decimal) | | | | 0.6 | 0.6 | 0.6 | 0.6 | 0.6 | 0.6 | 0.6 | 0.6 | 0.6 | 0.6 | 0.6 | 0.6 |
| Total consumed production in AUM's | | | | 0.0 | 0.0 | 9.7 | 32.7 | 55.2 | 38.1 | 18.2 | 16.8 | 25.7 | 29.0 | 13.5 | 0.0 |

Supply determination is automatically completed in animal unit months for each month.

Determining Demand Using the Spreadsheet

Step one

Decide on a calving period. There are six choices. Pick the one that best fits. For example, choose 1 for Feb, Mar, and April.

Enter animal information in calving period block one.

Demand Worksheet for Beef Cow-Calf Herd

All feed requirements are expressed as AUM's

For suggested animal unit equivalents, see appendix 7 in prescribed grazing standard

Calving period codes

| | | | | | |
|---|---|---|---|---|---|
| Feb, Mar, Apr = | 1 | Mar, Apr, May = | 2 | Apr, May, Jun = | 3 |
| Sep, Oct, Nov = | 4 | Oct, Nov, Dec = | 5 | Year Long = | 6 |

Step two

Enter the number of cows and bulls in the corresponding calving period.

Step three

Enter the animal unit equivalent for the cows and bulls.

| Animal | Calving Period | Number | Animal Unit Equivalent | January | February | March | April | May | June | July | August | September | October | November | December |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| dry cow | 1 | 15 | 1.2 | 18.0 | 12.1 | 6.1 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 18.0 | 18.0 | 18.0 |
| lact cow | | 5 | 1.35 | | 6.7 | | | | | | | | | | |
| lact cow | | 10 | 1.35 | | | 13.4 | | | | | | | | | |
| lact cow | | 15 | 1.35 | | | | 20.3 | 20.3 | 20.3 | 20.3 | 20.3 | 20.3 | 0.0 | 0.0 | 0.0 |
| bull | | 1 | 1.5 | | | | | 1.5 | 1.5 | 1.5 | | | | | |
| dry cow | 2 | 0 | 0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| lact cow | | 0 | 0 | | | 0.0 | | | | | | | | | |
| lact cow | | 0 | 0 | | | | 0.0 | | | | | | | | |
| lact cow | | 0 | 0 | | | | | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| bull | | 0 | 0 | | | | | | 0.0 | 0.0 | 0.0 | | | | |
| dry cow | 3 | 0 | 0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| lact cow | | 0 | 0 | | | | 0.0 | | | | | | | | |
| lact cow | | 0 | 0 | | | | | 0.0 | | | | | | | |
| lact cow | | 0 | 0 | | | | | | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| bull | | 0 | 0 | | | | | | | 0.0 | 0.0 | 0.0 | | | |
| dry cow | 4 | 0 | 0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| lact cow | | 0 | 0 | | | | | | | | | 0.0 | | | |
| lact cow | | 0 | 0 | | | | | | | | | | 0.0 | | |
| lact cow | | 0 | 0 | 0.0 | 0.0 | 0.0 | 0.0 | | | | | | | 0.0 | 0.0 |
| bull | | 0 | 0 | 0.0 | 0.0 | | | | | | | | | | 0.0 |
| dry cow | 5 | 0 | 0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| lact cow | | 0 | 0 | | | | | | | | | | 0.0 | | |
| lact cow | | 0 | 0 | | | | | | | | | | | 0.0 | |
| lact cow | | 0 | 0 | 0.0 | 0.0 | 0.0 | 0.0 | | | | | | | | 0.0 |
| bull | | 0 | 0 | 0.0 | 0.0 | 0.0 | | | | | | | | | |
| dry cow | 6 | 0 | 0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| lact cow | | 0 | 0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| bull | | 0 | 0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| rep heifers | | 0 | 0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| spring stockers | | 0 | 0 | | | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | | |
| winter stockers | | 0 | 0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | | | 0.0 | 0.0 | 0.0 | 0.0 |
| Total demand AUMs | | | | 18.0 | 18.8 | 19.5 | 20.3 | 21.8 | 21.8 | 21.8 | 20.3 | 20.3 | 18.0 | 18.0 | 18.0 |

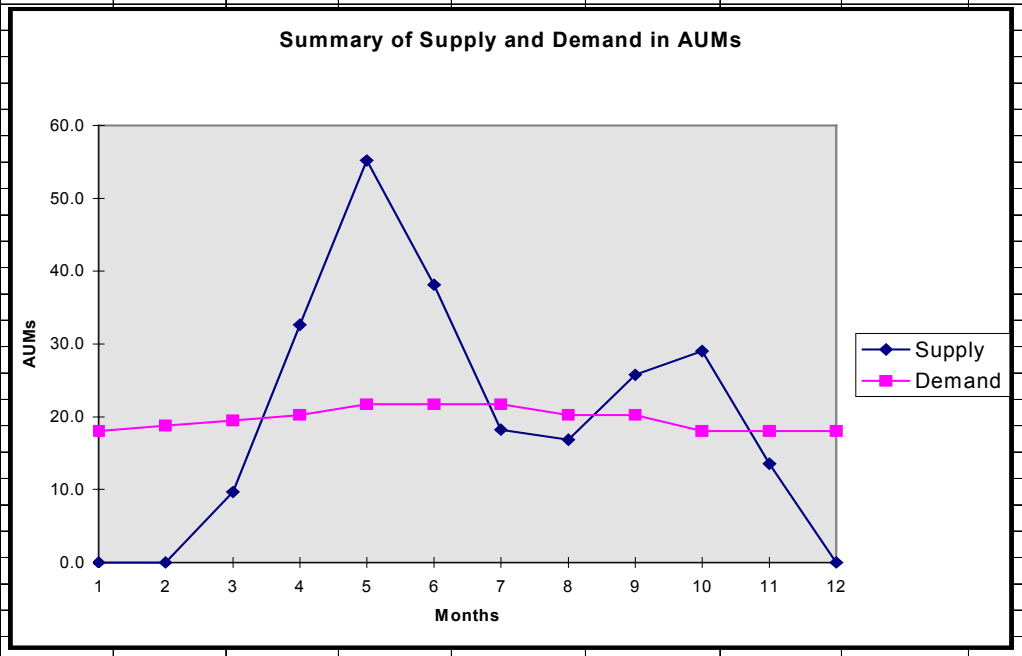
Demand is automatically completed.

Summary page

All figures are posted to this page automatically and a graph is presented to show comparison.

Balance by Month Worksheet (AUMs)

| | January | February | March | April | May | June | July | August | September | October | November | December |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Forage Supply (AUMs) | 0.0 | 0.0 | 9.7 | 32.7 | 55.2 | 38.1 | 18.2 | 16.8 | 25.7 | 29.0 | 13.5 | 0.0 |
| Forage Demand (AUMs) | 18.0 | 18.8 | 19.5 | 20.3 | 21.8 | 21.8 | 21.8 | 20.3 | 20.3 | 18.0 | 18.0 | 18.0 |
| Balance (AUMs) | -18.0 | -18.8 | -9.8 | 12.4 | 33.4 | 16.4 | -3.5 | -3.4 | 5.5 | 11.0 | -4.5 | -18.0 |
| Balance ( Tons Forage) | -7.1 | -7.4 | -3.9 | 4.9 | 13.2 | 6.5 | -1.4 | -1.3 | 2.2 | 4.4 | -1.8 | -7.1 |
| Running Total (Tons Forage) | -7.1 | -14.6 | -18.4 | -13.5 | -0.3 | 6.2 | 4.8 | 3.4 | 5.6 | 9.9 | 8.2 | 1.1 |




| | AUMs | Tons Forage |
|---|---|---|
| Total Supply (AUMs) = | 239.0 | 94.5 |
| Total Demand (AUMs) = | 236.3 | 93.4 |
| Balance (AUMs) = | 2.7 | 1.1 |
| Stocking Rate (Acs/AU) = | 2.8 | |

Operator Name — Enter identifying information
Address
Phone No
Date

Inventory Name — Technote illustration.xls
Name inventory, i.e., John Doe initial inventory

Go to "file" at top and choose "save as" a name you want.
This file will be saved as the new name and reappear on the screen.
The original work file will be saved empty for a new inventory.
Make changes to the "save as" file as desired, I.e., "what ifs"
Save changed inventory as "save as" a new name, I.e., John Doe inventory two
Continue as desired.

## Example Inventory

John Doe has a cow calf herd on 80 acres of pasture. He is unhappy with the operation because there is never enough forage, weaning weights are low, and there are always a lot of open cows. Hay is fed a majority of the months which requires finding "hay" fields off the farm. The quality is usually bad because neither the landowner nor he can afford to fertilize it.

A farm visit reveals the following information:

1. No fertilizer or lime has been applied for at least ten years.
2. There are three big fields with a stream at one end of the farm serving as the only water source. The stream is bordered by trees and the area is bare.
3. There is a well defined path through the pastures to the stream.
4. The primary forage is tall fescue. There are no legumes.
5. The plants around the manure pile have been closely grazed.
6. The soil survey shows a potential yield of 7500 lbs/ac/yr when well managed.
7. There are 50 1100 pound cows and two 1500 pound bulls. There are no replacement heifers or stockers.
8. There are calves of all sizes.

The producer's goals are:

1. All of the feed for the animals are to come off this farm
2. Improve forage yield and quality
3. Improve the farm's carrying capacity to its potential.
4. Increase the weaning eight and rate of calves.

The producer wants to know:

1. How many cows can be carried under the present conditions?
2. How many cows can be sustained if the farm produces to its potential?
3. What has to be done to achieve the farm's potential?

In completing the inventory, the following farm information is needed:

1. Number and size of each field (farm visit, aerial map)
2. Forage(s) and estimated yield for each field (farm visit, soil survey)
3. Estimated utilization rate (farm visit)
4. Number of cows (not cows and calves) and bulls and their weight (farm visit)
5. Calving season, if any (farm visit)
6. Other animals if present (stockers, replacement heifers) (farm visit)

First, inventory the current situation. See "John Doe inventory 1", pages 12 - 14.

## Forage Supply and Demand Worksheet (AUM's)

### Supply Worksheet

| | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Enter pounds dry matter per AUM** | | | | 790.8 | | Note: if a zero is in this field, an error message enters all computed fields | | | | | | | A numerical entry corrects the error | | |
| | **% Intake** | | **lbs/AUM** | | **% Intake** | | **lbs/AUM** | | | | | | | | |
| | 1.0% = | | 304.2 | | 2.6% = | | 790.8 | | | | | | | | |
| | 1.5% = | | 456.3 | | 3.0% = | | 912.5 | | | | | | | | |
| | 2.0% = | | 608.3 | | 3.5% = | | 1064.6 | | | | | | | | |
| | 2.5% = | | 760.4 | | | | | | | | | | | | |
| | | | | **January** | **February** | **March** | **April** | **May** | **June** | **July** | **August** | **September** | **October** | **November** | **December** |
| **Enter growth curve % (decimal)** | | | | 0.00 | 0.00 | 0.05 | 0.15 | 0.25 | 0.15 | 0.04 | 0.04 | 0.10 | 0.15 | 0.07 | 0.00 |
| **Forage(s)** | **Field No.** | **Yield/Acre** | **Acres** | | | | | | | | | | | | |
| TF-EI | 1 | 4500 | 30.0 | 0.0 | 0.0 | 8.5 | 25.6 | 42.7 | 25.6 | 6.8 | 6.8 | 17.1 | 25.6 | 11.9 | 0.0 |
| TF-EI | 2 | 4500 | 25.0 | 0.0 | 0.0 | 7.1 | 21.3 | 35.6 | 21.3 | 5.7 | 5.7 | 14.2 | 21.3 | 10.0 | 0.0 |
| TF-EI | 3 | 4500 | 25.0 | 0.0 | 0.0 | 7.1 | 21.3 | 35.6 | 21.3 | 5.7 | 5.7 | 14.2 | 21.3 | 10.0 | 0.0 |
| | | | | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| | | | | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| | | | | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| | | | | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| | | | | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| | | | | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| | | | | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| | | | | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| | | | | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| | | | | **January** | **February** | **March** | **April** | **May** | **June** | **July** | **August** | **September** | **October** | **November** | **December** |
| **Enter growth curve % (decimal)** | | | | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| **Forage(s)** | **Field No.** | **Yield/Acre** | **Acres** | | | | | | | | | | | | |
| | | | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| | | | | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| | | | | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| | | | | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| | | | | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| | | | | **January** | **February** | **March** | **April** | **May** | **June** | **July** | **August** | **September** | **October** | **November** | **December** |
| **Enter growth curve % (decimal)** | | | | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| **Forage(s)** | **Field No.** | **Yield/Acre** | **Acres** | | | | | | | | | | | | |
| | | | | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| | | | | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| | | | | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| | | | | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| | | | | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| **Subtotal for ALL fields in AUM's** | | | | **0.0** | **0.0** | **22.8** | **68.3** | **113.8** | **68.3** | **18.2** | **18.2** | **45.5** | **68.3** | **31.9** | **0.0** |
| Enter utilization rate adjustment (decimal) | | | | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| **Total consumed production in AUM's** | | | | **0.0** | **0.0** | **22.8** | **68.3** | **113.8** | **68.3** | **18.2** | **18.2** | **45.5** | **68.3** | **31.9** | **0.0** |

## Demand Worksheet

All feed requirements are expressed as AUM's

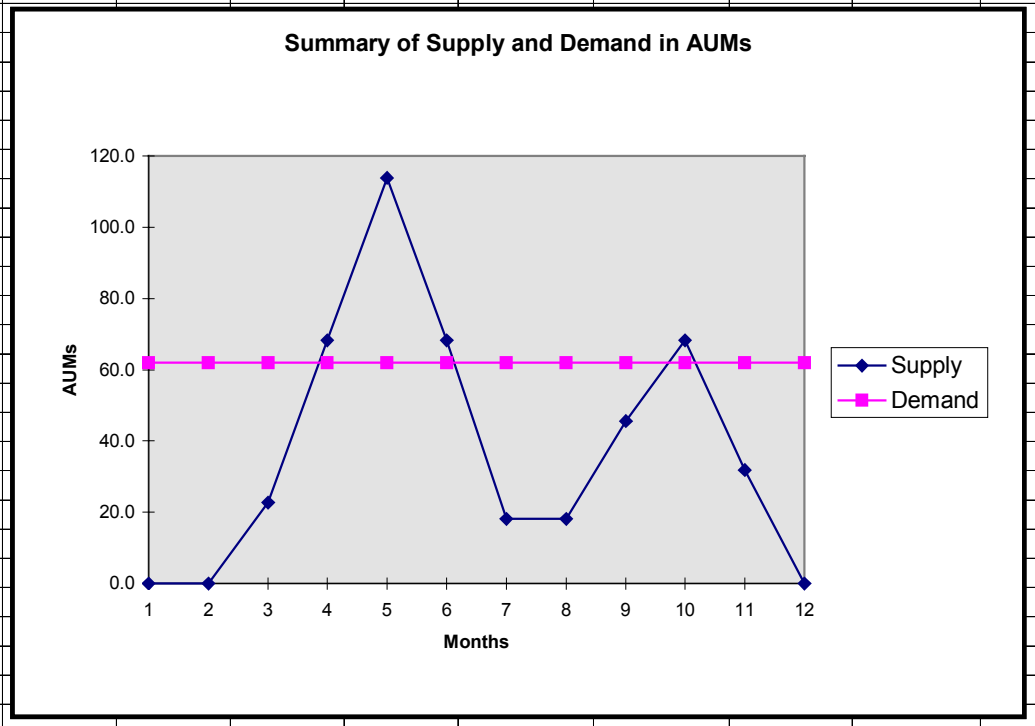
**Calving period codes**

| | | | | | |
|---|---|---|---|---|---|
| **Feb, Mar, Apr =** | **1** | **Mar, Apr, May =** | **2** | **Apr, May, Jun =** | **3** |
| **Sep, Oct, Nov =** | **4** | **Oct, Nov, Dec =** | **5** | **Year Long =** | **6** |

| Animal | Calving Period | Number | Animal Unit Equivalen | January | February | March | April | May | June | July | August | September | October | November | December |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **dry cow** | **1** | 0 | 0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| lact cow | | 0 | 0 | | 0.0 | | | | | | | | | | |
| lact cow | | 0 | 0 | | | 0.0 | | | | | | | | | |
| lact cow | | 0 | 0 | | | | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| bull | | 0 | 0 | | | | | 0.0 | 0.0 | 0.0 | | | | | |
| **dry cow** | **2** | 0 | 0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| lact cow | | 0 | 0 | | | 0.0 | | | | | | | | | |
| lact cow | | 0 | 0 | | | | 0.0 | | | | | | | | |
| lact cow | | 0 | 0 | | | | | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| bull | | 0 | 0 | | | | | | 0.0 | 0.0 | 0.0 | | | | |
| **dry cow** | **3** | 0 | 0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| lact cow | | 0 | 0 | | | | 0.0 | | | | | | | | |
| lact cow | | 0 | 0 | | | | | 0.0 | | | | | | | |
| lact cow | | 0 | 0 | | | | | | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| bull | | 0 | 0 | | | | | | | 0.0 | 0.0 | 0.0 | | | |
| **dry cow** | **4** | 0 | 0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| lact cow | | 0 | 0 | | | | | | | | | 0.0 | | | |
| lact cow | | 0 | 0 | | | | | | | | | | 0.0 | | |
| lact cow | | 0 | 0 | 0.0 | 0.0 | 0.0 | 0.0 | | | | | | | 0.0 | 0.0 |
| bull | | 0 | 0 | 0.0 | 0.0 | | | | | | | | | | 0.0 |
| **dry cow** | **5** | 0 | 0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| lact cow | | 0 | 0 | | | | | | | | | | 0.0 | | |
| lact cow | | 0 | 0 | | | | | | | | | | | 0.0 | |
| lact cow | | 0 | 0 | 0.0 | 0.0 | 0.0 | 0.0 | | | | | | | | 0.0 |
| bull | | 0 | 0 | 0.0 | 0.0 | 0.0 | | | | | | | | | |
| **dry cow** | **6** | 30 | 1.1 | 33.0 | 33.0 | 33.0 | 33.0 | 33.0 | 33.0 | 33.0 | 33.0 | 33.0 | 33.0 | 33.0 | 33.0 |
| lact cow | | 20 | 1.3 | 26.0 | 26.0 | 26.0 | 26.0 | 26.0 | 26.0 | 26.0 | 26.0 | 26.0 | 26.0 | 26.0 | 26.0 |
| bull | | 2 | 1.5 | 3.0 | 3.0 | 3.0 | 3.0 | 3.0 | 3.0 | 3.0 | 3.0 | 3.0 | 3.0 | 3.0 | 3.0 |
| rep heifers | | 0 | 0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| spring stockers | | 0 | 0 | | | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | | |
| winter stockers | | 0 | 0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | | | 0.0 | 0.0 | 0.0 | 0.0 |
| **Total demand AUMs** | | | | **62.0** | **62.0** | **62.0** | **62.0** | **62.0** | **62.0** | **62.0** | **62.0** | **62.0** | **62.0** | **62.0** | **62.0** |

**Balance by Month Worksheet (AUMs)**

| | January | February | March | April | May | June | July | August | September | October | November | December |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Forage Supply (AUMs)** | 0.0 | 0.0 | 22.8 | 68.3 | 113.8 | 68.3 | 18.2 | 18.2 | 45.5 | 68.3 | 31.9 | 0.0 |
| **Forage Demand (AUMs)** | 62.0 | 62.0 | 62.0 | 62.0 | 62.0 | 62.0 | 62.0 | 62.0 | 62.0 | 62.0 | 62.0 | 62.0 |
| **Balance (AUMs)** | **-62.0** | **-62.0** | **-39.2** | **6.3** | **51.8** | **6.3** | **-43.8** | **-43.8** | **-16.5** | **6.3** | **-30.1** | **-62.0** |
| **Balance (Tons Forage)** | -24.5 | -24.5 | -15.5 | 2.5 | 20.5 | 2.5 | -17.3 | -17.3 | -6.5 | 2.5 | -11.9 | -24.5 |
| **Running Total (Tons Forage)** | -24.5 | -49.0 | -64.5 | -62.1 | -41.6 | -39.1 | -56.4 | -73.7 | -80.2 | -77.7 | -89.7 | -114.2 |




| | AUMs | Tons Forage |
|---|---|---|
| **Total Supply (AUMs) =** | **455.2** | **180.0** |
| **Total Demand (AUMs) =** | **744.0** | **294.2** |
| **Balance (AUMs) =** | **-288.8** | **-114.2** |
| **Stocking Rate (Acs/AU) =** | **1.3** | |

Operator Name John Doe
Address
Phone No
Date

Inventory Name John Doe Inventory 1

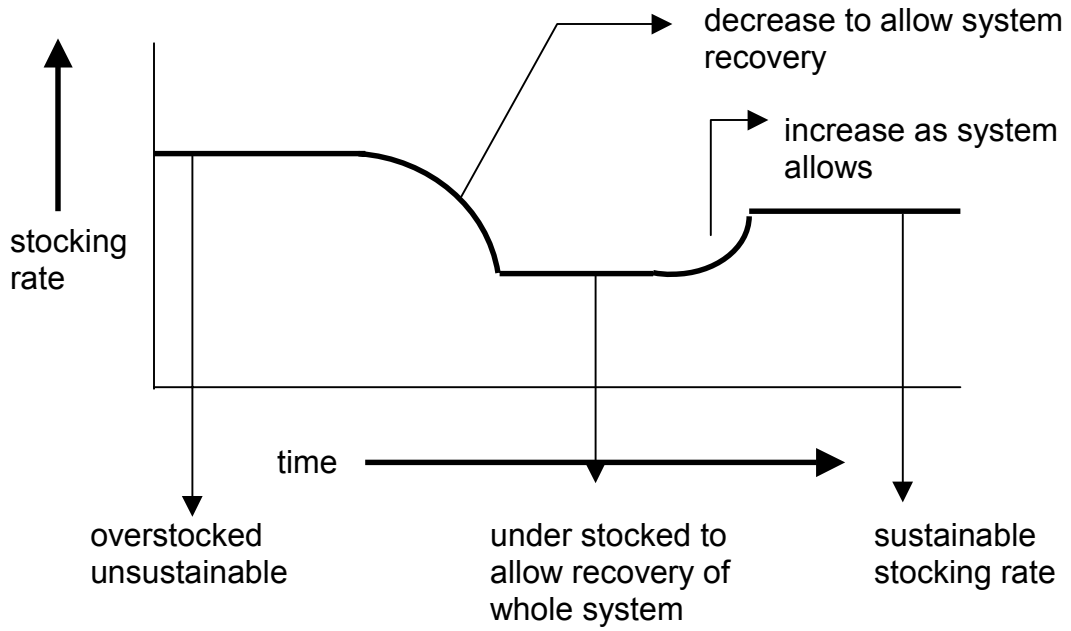
The information for the "current condition" inventory was determined as follows:

1. Pounds per animal unit month was based on 2.6% of body weight = 790.8
2. Growth curve was based on tall fescue for MLRA 128
3. Yields were estimated low due to overgrazing
4. Utilization rate was estimated extremely high due to over grazing
5. 50 cows on the farm with no calving period (calve all year long)
6. Animal unit equivalent for cows of 1.1 based on 1100 pounds weight
7. Two bulls weighing 1500 pounds giving animal unit equivalent of 1.5

Unless extremely well managed, utilization rates over 80% reduce forage yield. Plants cannot recover and over time weaken and die. Soils become exposed, erosion occurs, weeds encroach, infiltration is reduced, and runoff increased. Livestock performance suffers due to inadequate quantity and quality of forage.

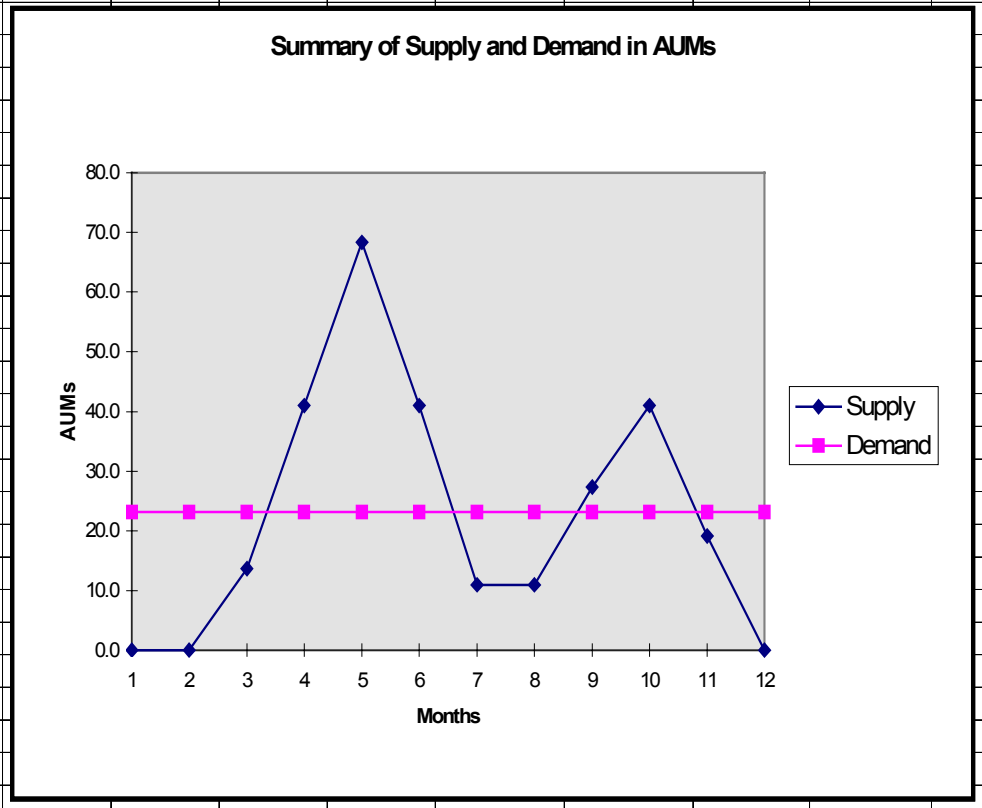
The current farm situation can only carry 18 to 20 cows and one bull with a utilization rate of 60%. See "inventory 2-demand altered to reflect supply summary page", page 16. Note the change in stocking rate from 1.3 acres per animal unit to 3.5 acres per animal unit.

By lowering demand to reflect current conditions, the system is allowed to recover. As this "healing" process continues, demand (stocking rate) can be increased until the <u>optimum sustainable</u> level has been reached.



## Balance by Month Worksheet (AUMs)

| | January | February | March | April | May | June | July | August | September | October | November | December |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Forage Supply (AUMs) | 0.0 | 0.0 | 13.7 | 41.0 | 68.3 | 41.0 | 10.9 | 10.9 | 27.3 | 41.0 | 19.1 | 0.0 |
| Forage Demand (AUMs) | 23.1 | 23.1 | 23.1 | 23.1 | 23.1 | 23.1 | 23.1 | 23.1 | 23.1 | 23.1 | 23.1 | 23.1 |
| **Balance (AUMs)** | **-23.1** | **-23.1** | **-9.4** | **17.9** | **45.2** | **17.9** | **-12.2** | **-12.2** | **4.2** | **17.9** | **-4.0** | **-23.1** |
| Balance (Tons Forage) | -9.1 | -9.1 | -3.7 | 7.1 | 17.9 | 7.1 | -4.8 | -4.8 | 1.7 | 7.1 | -1.6 | -9.1 |
| Running Total (Tons Forage) | -9.1 | -18.3 | -22.0 | -14.9 | 2.9 | 10.0 | 5.2 | 0.4 | 2.0 | 9.1 | 7.5 | -1.6 |




| | AUMs | Tons Forage |
|---|---|---|
| Total Supply (AUMs) = | 273.1 | 108.0 |
| Total Demand (AUMs) = | 277.2 | 109.6 |
| Balance (AUMs) = | -4.1 | -1.6 |
| Stocking Rate (Acs/AU) = | 3.5 | |

| | |
|---|---|
| Operator Name | John Doe |
| Address | |
| Phone No | |
| Date | |

Inventory Name: John Doe Inventory 2 - demand altered to reflect supply

Even if supply meets demand over the whole year, there are still significant gaps within the year regardless of the amount.

Actions taken to determine the sustainable carrying capacity of the farm were:

1. Farm subdivided into ten 8 acre paddocks (improve yield, quality, utilization)
2. Yield increased to 7500 pounds/acre/year (based on soil potential)
3. Fescue renovated with red clover (improve quality and distribution)
4. Orchardgrass/alfalfa planted in 2 fields (improve quality and distribution)
5. One field planted to switchgrass (improve distribution)

See "John Doe inventory 3 - potential with TF-RC, OG-AL, SWITCH", pages 18-20.

The soil survey shows a potential yield of 7500 lbs/ac/yr. Rotation and fertilization improve the yield and distribution is altered by forage selection. Utilization is improved from 60% to 75% due to a greater stocking density (more cattle graze a paddock for a shorter time). A calving season reduces the bull's presence to three months. One bull is used. These improvements allow a carrying capacity of 35 1100 pound cows and one 1500 pound bull. This is based on the farm providing all the forage needs of the herd for the whole year.

Reasons for reducing herd size to 35 cows and one bull are:

1. Less hay making and hay feeding (less time and labor, higher quality)
2. Hay produced on farm instead of off farm (less time, higher quality)
3. Less time and labor needed (substitute management for labor)
4. Smaller herd easier to manage (increase efficiency)
5. Increase profit or reduce loss (meet goals)

If 80% of 50 cows weaned 450 pound calves, 18,000 pounds of calves are sold. If 90% of 35 cows weaned 600 pound calves, 18,900 pounds of calves are sold. Moreover, the expense would go down due to less hay feeding (15 less cows and improved distribution), fewer open cows (3-4 versus 10). More pounds of calves are sold at less cost!

Hay quality usually improves when harvested on farm because of better management (fertility, timeliness).

More time can be spent managing the herd to develop a sound health program, and establish a defined calving period which improves nutrition, culling, and marketing strategies.

**Forage Supply and Demand Worksheet (AUM's)**

**Supply Worksheet**

| | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Enter pounds dry matter per AUM** | | | | 790.8 | | Note: if a zero is in this field, an error message enters all computed fields | | | | | | | A numerical entry corrects the error | | |
| | **% Intake** | | **lbs/AUM** | | **% Intake** | | **lbs/AUM** | | | | | | | | |
| | 1.0% = | | 304.2 | | 2.6% = | | 790.8 | | | | | | | | |
| | 1.5% = | | 456.3 | | 3.0% = | | 912.5 | | | | | | | | |
| | 2.0% = | | 608.3 | | 3.5% = | | 1064.6 | | | | | | | | |
| | 2.5% = | | 760.4 | | | | | | | | | | | | |
| | | | | **January** | **February** | **March** | **April** | **May** | **June** | **July** | **August** | **September** | **October** | **November** | **December** |
| **Enter growth curve % (decimal)** | | | | 0.00 | 0.03 | 0.10 | 0.25 | 0.20 | 0.12 | 0.06 | 0.06 | 0.07 | 0.08 | 0.03 | 0.00 |
| **Forage(s)** | **Field No.** | **Yield/Acre** | **Acres** | | | | | | | | | | | | |
| TF-RC | 1 | 7500 | 8.0 | 0.0 | 2.3 | 7.6 | 19.0 | 15.2 | 9.1 | 4.6 | 4.6 | 5.3 | 6.1 | 2.3 | 0.0 |
| TF-RC | 2 | 7500 | 8.0 | 0.0 | 2.3 | 7.6 | 19.0 | 15.2 | 9.1 | 4.6 | 4.6 | 5.3 | 6.1 | 2.3 | 0.0 |
| TF-RC | 3 | 7500 | 8.0 | 0.0 | 2.3 | 7.6 | 19.0 | 15.2 | 9.1 | 4.6 | 4.6 | 5.3 | 6.1 | 2.3 | 0.0 |
| TF-RC | 4 | 7500 | 8.0 | 0.0 | 2.3 | 7.6 | 19.0 | 15.2 | 9.1 | 4.6 | 4.6 | 5.3 | 6.1 | 2.3 | 0.0 |
| TF-RC | 5 | 7500 | 8.0 | 0.0 | 2.3 | 7.6 | 19.0 | 15.2 | 9.1 | 4.6 | 4.6 | 5.3 | 6.1 | 2.3 | 0.0 |
| TF-RC | 6 | 7500 | 8.0 | 0.0 | 2.3 | 7.6 | 19.0 | 15.2 | 9.1 | 4.6 | 4.6 | 5.3 | 6.1 | 2.3 | 0.0 |
| TF-RC | 7 | 7500 | 8.0 | 0.0 | 2.3 | 7.6 | 19.0 | 15.2 | 9.1 | 4.6 | 4.6 | 5.3 | 6.1 | 2.3 | 0.0 |
| | | | | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| | | | | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| | | | | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| | | | | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| | | | | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| | | | | **January** | **February** | **March** | **April** | **May** | **June** | **July** | **August** | **September** | **October** | **November** | **December** |
| **Enter growth curve % (decimal)** | | | | 0.00 | 0.00 | 0.05 | 0.15 | 0.20 | 0.17 | 0.08 | 0.10 | 0.13 | 0.12 | 0.00 | 0.00 |
| **Forage(s)** | **Field No.** | **Yield/Acre** | **Acres** | | | | | | | | | | | | |
| OG+AL | 8 | 7500 | 8.0 | 0.0 | 0.0 | 3.8 | 11.4 | 15.2 | 12.9 | 6.1 | 7.6 | 9.9 | 9.1 | 0.0 | 0.0 |
| OG+AL | 9 | 7500 | 8.0 | 0.0 | 0.0 | 3.8 | 11.4 | 15.2 | 12.9 | 6.1 | 7.6 | 9.9 | 9.1 | 0.0 | 0.0 |
| | | | | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| | | | | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| | | | | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| | | | | **January** | **February** | **March** | **April** | **May** | **June** | **July** | **August** | **September** | **October** | **November** | **December** |
| **Enter growth curve % (decimal)** | | | | 0.00 | 0.00 | 0.00 | 0.08 | 0.15 | 0.20 | 0.23 | 0.20 | 0.14 | 0.00 | 0.00 | 0.00 |
| **Forage(s)** | **Field No.** | **Yield/Acre** | **Acres** | | | | | | | | | | | | |
| SWITCH | 10 | 7500 | 8.0 | 0.0 | 0.0 | 0.0 | 6.1 | 11.4 | 15.2 | 17.5 | 15.2 | 10.6 | 0.0 | 0.0 | 0.0 |
| | | | | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| | | | | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| | | | | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| | | | | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| **Subtotal for ALL fields in AUM's** | | | | **0.0** | **15.9** | **60.7** | **161.6** | **148.0** | **104.7** | **61.5** | **62.2** | **67.5** | **60.7** | **15.9** | **0.0** |
| Enter utilization rate adjustement (decimal) | | | | 0.75 | 0.75 | 0.75 | 0.75 | 0.75 | 0.75 | 0.75 | 0.75 | 0.75 | 0.75 | 0.75 | 0.75 |
| **Total consumed production in AUM's** | | | | **0.0** | **12.0** | **45.5** | **121.2** | **111.0** | **78.5** | **46.1** | **46.7** | **50.6** | **45.5** | **12.0** | **0.0** |

**Demand Worksheet for Beef Cow-Calf Herd**

All feed requirements are expressed as AUM's

For suggested animal unit equivalents, see appendix 7 in prescribed grazing standard

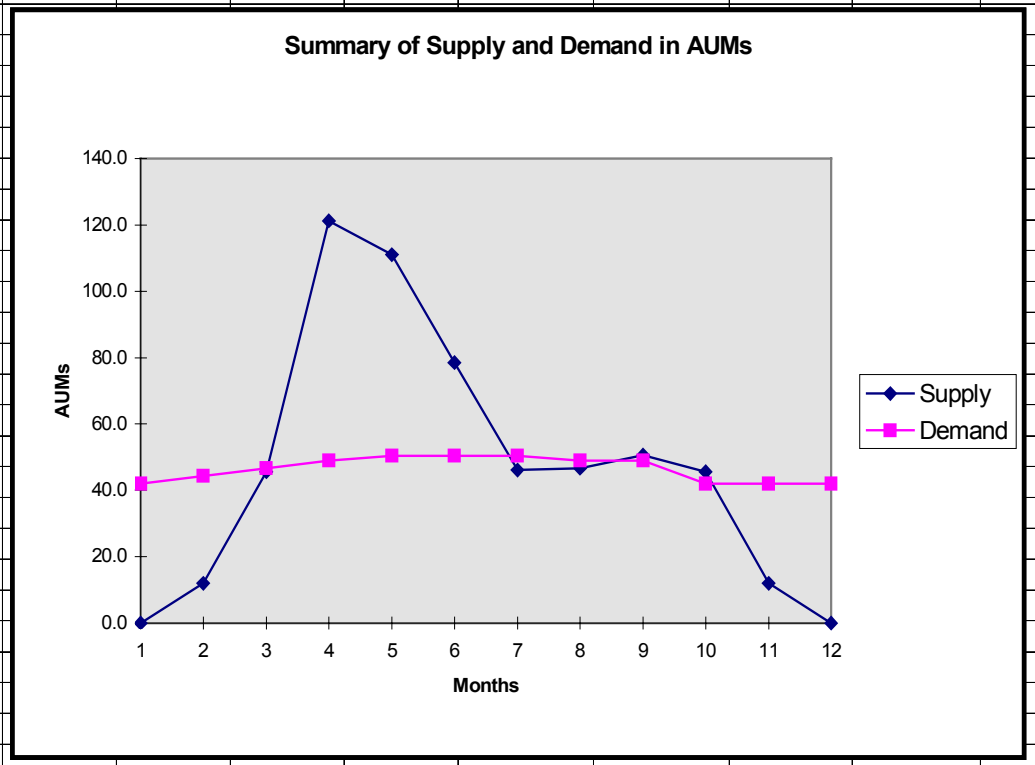
**Calving period codes**

| | | | | | |
|---|---|---|---|---|---|
| **Feb, Mar, Apr =** | **1** | **Mar, Apr, May =** | **2** | **Apr, May, Jun =** | **3** |
| **Sep, Oct, Nov =** | **4** | **Oct, Nov, Dec =** | **5** | **Year Long =** | **6** |

| Animal | Calving Period | Number | Animal Unit Equivalen | January | February | March | April | May | June | July | August | September | October | November | December |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **dry cow** | **1** | 35 | 1.2 | 42.0 | 28.1 | 14.3 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 42.0 | 42.0 | 42.0 |
| lact cow | | 12 | 1.4 | | 16.2 | | | | | | | | | | |
| lact cow | | 23 | 1.4 | | | 32.3 | | | | | | | | | |
| lact cow | | 35 | 1.4 | | | | 49.0 | 49.0 | 49.0 | 49.0 | 49.0 | 49.0 | 0.0 | 0.0 | 0.0 |
| bull | | 1 | 1.5 | | | | | 1.5 | 1.5 | 1.5 | | | | | |
| **dry cow** | **2** | 0 | 0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| lact cow | | 0 | 0 | | | 0.0 | | | | | | | | | |
| lact cow | | 0 | 0 | | | | 0.0 | | | | | | | | |
| lact cow | | 0 | 0 | | | | | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| bull | | 0 | 0 | | | | | | 0.0 | 0.0 | 0.0 | | | | |
| **dry cow** | **3** | 0 | 0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| lact cow | | 0 | 0 | | | | 0.0 | | | | | | | | |
| lact cow | | 0 | 0 | | | | | 0.0 | | | | | | | |
| lact cow | | 0 | 0 | | | | | | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| bull | | 0 | 0 | | | | | | | 0.0 | 0.0 | 0.0 | | | |
| **dry cow** | **4** | 0 | 0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| lact cow | | 0 | 0 | | | | | | | | | 0.0 | | | |
| lact cow | | 0 | 0 | | | | | | | | | | 0.0 | | |
| lact cow | | 0 | 0 | 0.0 | 0.0 | 0.0 | 0.0 | | | | | | | 0.0 | 0.0 |
| bull | | 0 | 0 | 0.0 | 0.0 | | | | | | | | | | 0.0 |
| **dry cow** | **5** | 0 | 0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| lact cow | | 0 | 0 | | | | | | | | | | 0.0 | | |
| lact cow | | 0 | 0 | | | | | | | | | | | 0.0 | |
| lact cow | | 0 | 0 | 0.0 | 0.0 | 0.0 | 0.0 | | | | | | | | 0.0 |
| bull | | 0 | 0 | 0.0 | 0.0 | 0.0 | | | | | | | | | |
| **dry cow** | **6** | 0 | 0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| lact cow | | 0 | 0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| bull | | 0 | 0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| rep heifers | | 0 | 0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| spring stockers | | 0 | 0 | | | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | | |
| winter stockers | | 0 | 0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | | | 0.0 | 0.0 | 0.0 | 0.0 |
| **Total demand AUMs** | | | | **42.0** | **44.3** | **46.6** | **49.0** | **50.5** | **50.5** | **50.5** | **49.0** | **49.0** | **42.0** | **42.0** | **42.0** |

**Balance by Month Worksheet (AUMs)**

| | January | February | March | April | May | June | July | August | September | October | November | December |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Forage Supply (AUMs)** | 0.0 | 12.0 | 45.5 | 121.2 | 111.0 | 78.5 | 46.1 | 46.7 | 50.6 | 45.5 | 12.0 | 0.0 |
| **Forage Demand (AUMs)** | 42.0 | 44.3 | 46.6 | 49.0 | 50.5 | 50.5 | 50.5 | 49.0 | 49.0 | 42.0 | 42.0 | 42.0 |
| **Balance (AUMs)** | **-42.0** | **-32.4** | **-1.1** | **72.2** | **60.5** | **28.0** | **-4.4** | **-2.3** | **1.6** | **3.5** | **-30.0** | **-42.0** |
| **Balance (Tons Forage)** | -16.6 | -12.8 | -0.4 | 28.6 | 23.9 | 11.1 | -1.7 | -0.9 | 0.7 | 1.4 | -11.9 | -16.6 |
| **Running Total (Tons Forage)** | -16.6 | -29.4 | -29.8 | -1.3 | 22.6 | 33.7 | 32.0 | 31.0 | 31.7 | 33.1 | 21.2 | 4.6 |

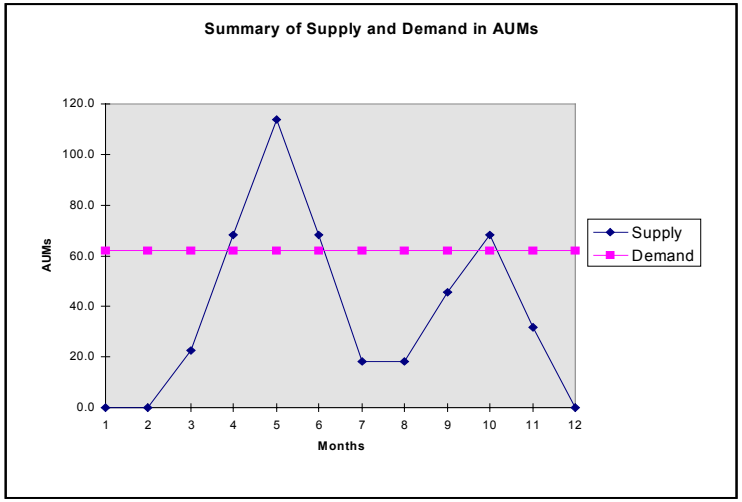



| | AUMs | Tons Forage |
|---|---|---|
| **Total Supply (AUMs) =** | **569.1** | **225.0** |
| **Total Demand (AUMs) =** | **557.4** | **220.4** |
| **Balance (AUMs) =** | **11.6** | **4.6** |
| **Stocking Rate (Acs/AU) =** | **1.7** | |

| | |
|---|---|
| Operator Name | John Doe |
| Address | |
| Phone No | |
| Date | |

Inventory Name: John Doe Inventory 3 - potential with TF-RC, OG-AL, SWITCH

## Inventory Of Initial Conditions

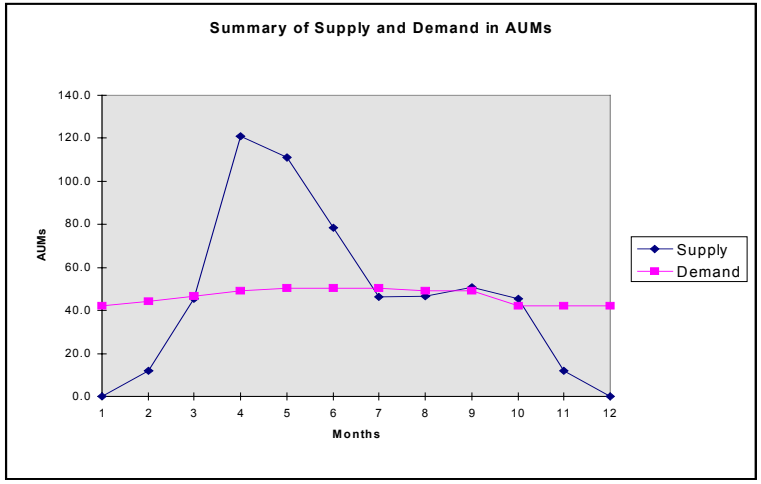



Total Supply = 180 tons
Total Demand = 294 tons
Balance = -114.2 tons

**Characteristics**

three large fields
only have fescue, no legumes
yield is ave of 4500 lbs/ac/yr
excessive utilization rate
no calving period
bulls on system all year
need 114 tons of hay
feed hay 8 months
takes more time and labor
more expense

## Inventory Of Farm Potential




Total Supply = 225 tons
Total Demand = 220 tons
Balance = +4.6 tons

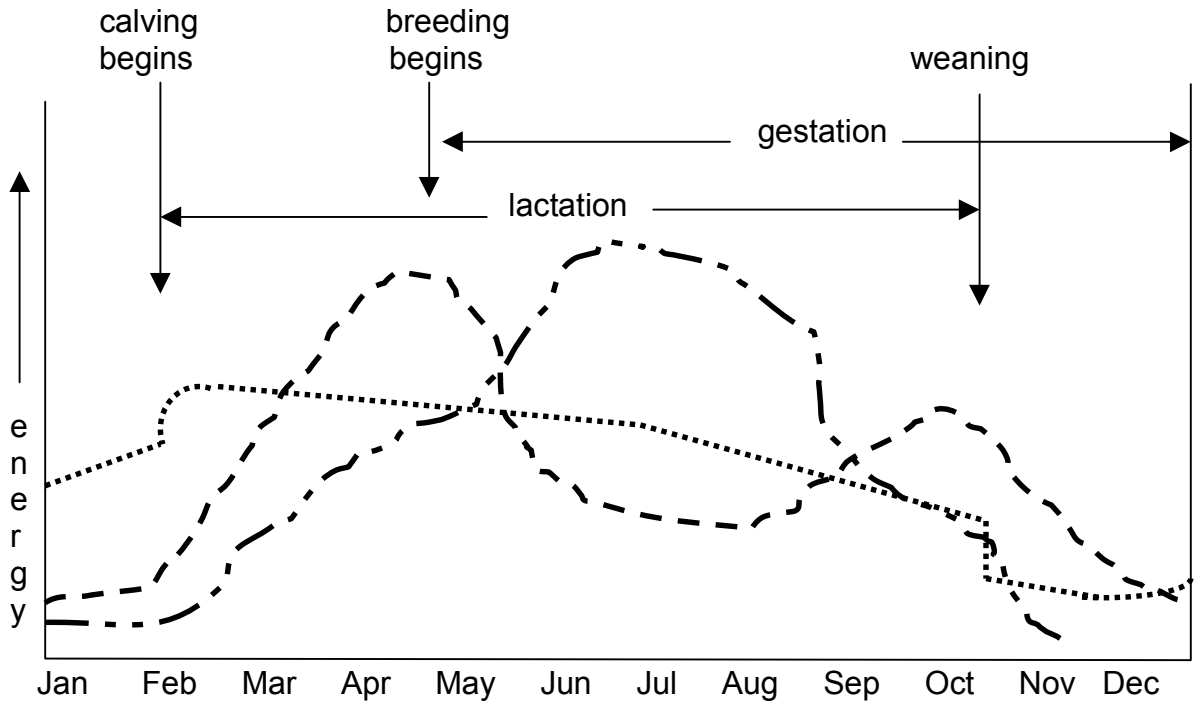
**Characteristics**

ten smaller fields for rotation
combination of forages
    tall fescue/orchardgrass with red clover
    switchgrass
feed hay 4 months
bulls on system three months
defined calving system
yield is ave of 7500 lbs/ac/yr
proper utilization rate
no off farm feed needed

# Summary

"No other single management practice affects profitability of livestock more than stocking rate."
- Larry Redmon and Terrence Gidwell, Oklahoma State University

Supply and demand change over the year. Supply changes due to forage growth curves, soils, weather, and management. Demand changes due to growth, lactation, weaning, and management. Estimating and planning for these changes is important to managing a grazing system.




beef cow energy needs (spring calving)

cool season forage growth curve

warm season forage growth curve

Grazing is a system. Systems are made up of components. Each component affects the other components.

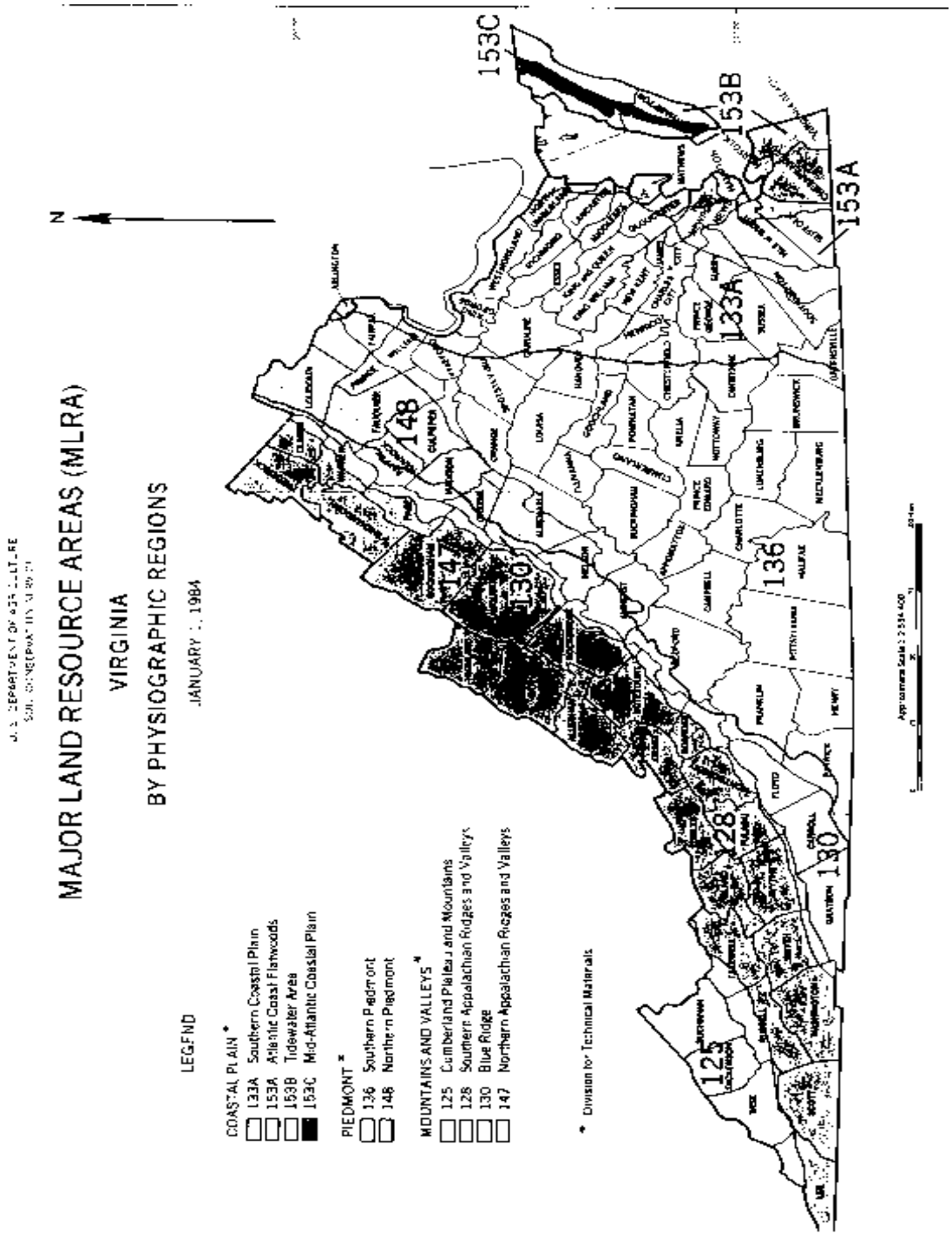
An inventory provides information on how to best manage all components for an optimum system. If livestock management is excellent but the forages are not, then forages is the limiting factor in the system. If forages are excellent but the livestock management is such that it cannot utilize it properly then animals are the limiting factor. If management is lacking for all components, then the system is both costly and detrimental to the environment.

An inventory provides information on how to:

- protect the resource base;
- increase yield and quality of forage;
- determine an appropriate utilization rate;
- reduce the effects of dry weather;
- lower costs by reducing the amount of hay needed;
- improve animal performance;
- meet producer goals;
- optimize the relationships of grazing system components; and
- approach economical and environmental sustainability.

Regardless of the method used, an inventory is essential for planning grazing systems because it takes into account all factors of a grazing system (soils, forages, animals, and producer goals). The relationship between these factors are better understood. By altering one factor (yield for example) the effect on all other factors are shown.

## Appendix 1 - Virginia MLRA Map



## Appendix 2 - Forage Growth Curves

**Appendix 2 - Forage Growth Curves by MLRA**

**MLRA 125-Cumberland Plateau & Mountains** **MLRA 128-Southern Appalachian Ridges & Valleys**
**MLRA 130 - Blue Ridge** **MLRA 147 - Northern Appalachian Ridges and Valleys**

| | Species | Jan | Feb | Mar | Apr | May | Jun | Jul | Aug | Sep | Oct | Nov | Dec |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | Alfalfa | 0.00 | 0.00 | 0.05 | 0.16 | 0.21 | 0.16 | 0.11 | 0.16 | 0.11 | 0.04 | 0.00 | 0.00 |
| 2 | Barley | 0.04 | 0.10 | 0.16 | 0.23 | 0.20 | 0.00 | 0.00 | 0.00 | 0.00 | 0.09 | 0.12 | 0.06 |
| 3 | Birdsfoot Trefoil | 0.00 | 0.00 | 0.00 | 0.05 | 0.20 | 0.25 | 0.25 | 0.10 | 0.09 | 0.05 | 0.01 | 0.00 |
| 4 | Bluegrass | 0.00 | 0.00 | 0.10 | 0.25 | 0.25 | 0.10 | 0.00 | 0.00 | 0.20 | 0.10 | 0.00 | 0.00 |
| 5 | Bluegrass + White Clover | 0.00 | 0.01 | 0.11 | 0.15 | 0.25 | 0.20 | 0.10 | 0.04 | 0.07 | 0.07 | 0.00 | 0.00 |
| 6 | Bluestem, Big | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.20 | 0.50 | 0.30 | 0.00 | 0.00 | 0.00 | 0.00 |
| 7 | Bluestem, Caucasian | 0.00 | 0.00 | 0.00 | 0.05 | 0.16 | 0.21 | 0.24 | 0.24 | 0.10 | 0.00 | 0.00 | 0.00 |
| 8 | Corn/Tropical Corn | 0.00 | 0.00 | 0.00 | 0.00 | 0.06 | 0.21 | 0.30 | 0.25 | 0.18 | 0.00 | 0.00 | 0.00 |
| 9 | Crabgrass | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.05 | 0.28 | 0.32 | 0.27 | 0.08 | 0.00 | 0.00 |
| 10 | Gamagrass, Eastern | 0.00 | 0.00 | 0.00 | 0.00 | 0.08 | 0.24 | 0.27 | 0.27 | 0.14 | 0.00 | 0.00 | 0.00 |
| 11 | Indiangrass | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.25 | 0.28 | 0.27 | 0.20 | 0.00 | 0.00 | 0.00 |
| 12 | Lespedeza, Annual + Tall Fescue (EF) | 0.00 | 0.05 | 0.07 | 0.11 | 0.10 | 0.16 | 0.15 | 0.12 | 0.08 | 0.10 | 0.06 | 0.00 |
| 13 | Lespedeza, Annual + Tall Fescue (EI) | 0.00 | 0.05 | 0.07 | 0.11 | 0.10 | 0.15 | 0.16 | 0.14 | 0.07 | 0.15 | 0.00 | 0.00 |
| 14 | Lespedeza, Sericea | 0.00 | 0.00 | 0.00 | 0.02 | 0.16 | 0.31 | 0.26 | 0.17 | 0.08 | 0.00 | 0.00 | 0.00 |
| 15 | Orchardgrass | 0.00 | 0.07 | 0.14 | 0.20 | 0.19 | 0.08 | 0.04 | 0.05 | 0.07 | 0.10 | 0.06 | 0.00 |
| 16 | Orchardgrass + Alfalfa | 0.00 | 0.00 | 0.05 | 0.15 | 0.20 | 0.17 | 0.08 | 0.10 | 0.13 | 0.12 | 0.00 | 0.00 |
| 17 | Orchardgrass + Ladino Clover | 0.00 | 0.03 | 0.12 | 0.25 | 0.20 | 0.10 | 0.06 | 0.06 | 0.07 | 0.08 | 0.03 | 0.00 |
| 18 | Orchardgrass + Red Clover | 0.00 | 0.00 | 0.15 | 0.22 | 0.20 | 0.13 | 0.06 | 0.04 | 0.06 | 0.08 | 0.06 | 0.00 |
| 19 | Orchardgrass + Tall Fescue (EF) | 0.00 | 0.07 | 0.14 | 0.20 | 0.17 | 0.08 | 0.02 | 0.03 | 0.07 | 0.13 | 0.09 | 0.00 |
| 20 | Orchardgrass+Tall Fescue(EF)+Ladino Cl | 0.00 | 0.06 | 0.14 | 0.22 | 0.18 | 0.08 | 0.03 | 0.03 | 0.07 | 0.12 | 0.07 | 0.00 |
| 21 | Orchardgrass+Tall Fescue(EF)+Red Clov | 0.00 | 0.06 | 0.14 | 0.22 | 0.18 | 0.08 | 0.03 | 0.03 | 0.07 | 0.12 | 0.07 | 0.00 |
| 22 | Orchardgrass + Tall Fescue (EI) | 0.00 | 0.07 | 0.14 | 0.20 | 0.16 | 0.07 | 0.03 | 0.04 | 0.07 | 0.12 | 0.10 | 0.00 |
| 23 | Orchardgrass+Tall Fescue(EI)+Ladino Cl | 0.00 | 0.07 | 0.14 | 0.23 | 0.14 | 0.01 | 0.01 | 0.01 | 0.14 | 0.14 | 0.11 | 0.00 |
| 24 | Orchardgrass+Tall Fescue(EI)+Red Clov | 0.00 | 0.07 | 0.14 | 0.23 | 0.14 | 0.01 | 0.01 | 0.01 | 0.14 | 0.14 | 0.11 | 0.00 |
| 25 | Rescuegrass aka Matua | 0.00 | 0.19 | 0.25 | 0.25 | 0.21 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.08 | 0.02 |
| 26 | Rye | 0.00 | 0.14 | 0.15 | 0.22 | 0.19 | 0.03 | 0.00 | 0.00 | 0.03 | 0.08 | 0.14 | 0.02 |
| 27 | Ryegrass, Annual | 0.00 | 0.10 | 0.15 | 0.30 | 0.25 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.15 | 0.05 |
| 28 | Ryegrass, Perennial | 0.00 | 0.08 | 0.14 | 0.20 | 0.15 | 0.06 | 0.02 | 0.03 | 0.07 | 0.15 | 0.10 | 0.00 |
| 29 | Soybeans + Millet | 0.00 | 0.00 | 0.00 | 0.00 | 0.02 | 0.25 | 0.30 | 0.25 | 0.18 | 0.00 | 0.00 | 0.00 |
| 30 | Switchgrass | 0.00 | 0.00 | 0.00 | 0.08 | 0.15 | 0.20 | 0.23 | 0.20 | 0.14 | 0.00 | 0.00 | 0.00 |
| 31 | Tall Fescue (EF) | 0.00 | 0.00 | 0.05 | 0.20 | 0.25 | 0.15 | 0.02 | 0.02 | 0.08 | 0.15 | 0.08 | 0.00 |
| 32 | Tall Fescue (EF) + Ladino Clover | 0.00 | 0.05 | 0.10 | 0.25 | 0.20 | 0.08 | 0.04 | 0.04 | 0.08 | 0.10 | 0.06 | 0.00 |
| 33 | Tall Fescue (EF) + Red Clover | 0.00 | 0.03 | 0.10 | 0.25 | 0.20 | 0.12 | 0.06 | 0.06 | 0.07 | 0.08 | 0.03 | 0.00 |
| 34 | Tall Fescue (EI) | 0.00 | 0.00 | 0.05 | 0.15 | 0.25 | 0.15 | 0.04 | 0.04 | 0.10 | 0.15 | 0.07 | 0.00 |
| 35 | Tall Fescue (EI) + Ladino Clover | 0.00 | 0.05 | 0.10 | 0.25 | 0.20 | 0.08 | 0.04 | 0.04 | 0.08 | 0.10 | 0.06 | 0.00 |
| 36 | Tall Fescue (EI) + Red Clover | 0.00 | 0.03 | 0.10 | 0.25 | 0.20 | 0.12 | 0.06 | 0.06 | 0.07 | 0.08 | 0.03 | 0.00 |
| 37 | Timothy | 0.00 | 0.00 | 0.00 | 0.10 | 0.25 | 0.35 | 0.15 | 0.05 | 0.05 | 0.05 | 0.00 | 0.00 |
| 38 | Warm Season Annuals | 0.00 | 0.00 | 0.00 | 0.00 | 0.05 | 0.22 | 0.30 | 0.25 | 0.18 | 0.00 | 0.00 | 0.00 |
| 39 | Wheat | 0.00 | 0.14 | 0.15 | 0.22 | 0.19 | 0.03 | 0.00 | 0.00 | 0.03 | 0.08 | 0.16 | 0.00 |

**MLRA 133A-Southern Coastal Plain** **MLRA 153A - Atlantic Coast Flatwoods**
**MLRA 153B - Tidewateer Area**

| | Species | Jan | Feb | Mar | Apr | May | Jun | Jul | Aug | Sep | Oct | Nov | Dec |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | Alfalfa | 0.00 | 0.00 | 0.11 | 0.14 | 0.20 | 0.15 | 0.10 | 0.15 | 0.10 | 0.03 | 0.91 | 0.00 |
| 2 | Bahaigrass | 0.00 | 0.00 | 0.00 | 0.02 | 0.04 | 0.21 | 0.25 | 0.21 | 0.16 | 0.09 | 0.02 | 0.00 |
| 3 | Bermudagrass, Common | 0.00 | 0.00 | 0.01 | 0.07 | 0.12 | 0.15 | 0.25 | 0.20 | 0.12 | 0.07 | 0.01 | 0.00 |
| 4 | Bermudagrass, Common + Rye | 0.03 | 0.04 | 0.10 | 0.14 | 0.06 | 0.08 | 0.17 | 0.15 | 0.09 | 0.05 | 0.05 | 0.04 |
| 5 | Bermudagrass, Hybrid | 0.00 | 0.00 | 0.01 | 0.07 | 0.10 | 0.15 | 0.25 | 0.20 | 0.15 | 0.05 | 0.01 | 0.01 |
| 6 | Bermudagrass, Hybrid + Rye | 0.03 | 0.04 | 0.10 | 0.14 | 0.06 | 0.08 | 0.17 | 0.15 | 0.09 | 0.05 | 0.05 | 0.04 |
| 7 | Bluestem, Big | 0.00 | 0.00 | 0.00 | 0.00 | 0.05 | 0.15 | 0.50 | 0.25 | 0.05 | 0.00 | 0.00 | 0.00 |
| 8 | Bluestem, Caucasian | 0.00 | 0.00 | 0.01 | 0.07 | 0.15 | 0.20 | 0.23 | 0.20 | 0.13 | 0.01 | 0.00 | 0.00 |
| 9 | Corn/Tropical Corn | 0.00 | 0.00 | 0.00 | 0.01 | 0.06 | 0.20 | 0.30 | 0.25 | 0.15 | 0.03 | 0.00 | 0.00 |
| 10 | Crabgrass | 0.00 | 0.00 | 0.00 | 0.00 | 0.01 | 0.07 | 0.26 | 0.30 | 0.25 | 0.10 | 0.01 | 0.00 |
| 11 | Gamagrass, Eastern | 0.00 | 0.00 | 0.00 | 0.01 | 0.07 | 0.23 | 0.26 | 0.26 | 0.16 | 0.01 | 0.00 | 0.00 |
| 12 | Flaccidgrass | 0.00 | 0.01 | 0.03 | 0.05 | 0.11 | 0.24 | 0.24 | 0.18 | 0.10 | 0.03 | 0.01 | 0.00 |
| 13 | Indiangrass | 0.00 | 0.00 | 0.00 | 0.00 | 0.05 | 0.21 | 0.28 | 0.26 | 0.15 | 0.05 | 0.00 | 0.00 |
| 14 | Johnsongrass | 0.00 | 0.00 | 0.00 | 0.01 | 0.03 | 0.25 | 0.27 | 0.25 | 0.15 | 0.03 | 0.01 | 0.00 |
| 15 | Kudzu | 0.00 | 0.00 | 0.01 | 0.02 | 0.15 | 0.25 | 0.25 | 0.15 | 0.10 | 0.06 | 0.01 | 0.00 |
| 16 | Lespedeza, Annual + Tall Fescue (EF&EI) | 0.02 | 0.03 | 0.07 | 0.11 | 0.10 | 0.16 | 0.15 | 0.12 | 0.08 | 0.10 | 0.04 | 0.02 |
| 17 | Lespedeza, Sericea | 0.00 | 0.00 | 0.01 | 0.04 | 0.15 | 0.30 | 0.25 | 0.15 | 0.09 | 0.01 | 0.00 | 0.00 |
| 18 | Oats | 0.05 | 0.09 | 0.15 | 0.22 | 0.19 | 0.03 | 0.00 | 0.00 | 0.03 | 0.08 | 0.10 | 0.06 |
| 19 | Orchardgrass * | 0.03 | 0.06 | 0.15 | 0.25 | 0.20 | 0.06 | 0.00 | 0.00 | 0.04 | 0.10 | 0.07 | 0.04 |
| 20 | Orchardgrass + Alfalfa | 0.02 | 0.02 | 0.11 | 0.16 | 0.20 | 0.14 | 0.05 | 0.05 | 0.06 | 0.10 | 0.07 | 0.02 |
| 21 | Orchardgrass+Red and/or Ladino Clover | 0.01 | 0.02 | 0.15 | 0.25 | 0.18 | 0.08 | 0.03 | 0.03 | 0.05 | 0.10 | 0.07 | 0.03 |
| 22 | Orchardgrass + Tall Fescue (EF) | 0.03 | 0.05 | 0.14 | 0.25 | 0.19 | 0.05 | 0.00 | 0.00 | 0.05 | 0.13 | 0.08 | 0.03 |
| 23 | Orchardgrass + Tall Fescue (EI) | 0.03 | 0.06 | 0.15 | 0.25 | 0.16 | 0.08 | 0.01 | 0.01 | 0.06 | 0.10 | 0.07 | 0.04 |
| 24 | Rescuegrass aka Matua | 0.03 | 0.06 | 0.15 | 0.25 | 0.16 | 0.06 | 0.01 | 0.01 | 0.06 | 0.10 | 0.07 | 0.04 |
| 25 | Rye | 0.05 | 0.09 | 0.15 | 0.22 | 0.19 | 0.03 | 0.00 | 0.00 | 0.03 | 0.08 | 0.10 | 0.06 |
| 26 | Ryegrass, Annual | 0.05 | 0.05 | 0.15 | 0.30 | 0.25 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.10 | 0.10 |
| 27 | Ryegrass, Perennial | 0.03 | 0.05 | 0.14 | 0.20 | 0.15 | 0.06 | 0.02 | 0.03 | 0.07 | 0.15 | 0.07 | 0.03 |
| 28 | Switchgrass | 0.00 | 0.01 | 0.02 | 0.05 | 0.15 | 0.20 | 0.23 | 0.20 | 0.09 | 0.04 | 0.01 | 0.00 |
| 29 | Tall Fescue (EF) | 0.03 | 0.05 | 0.14 | 0.20 | 0.16 | 0.07 | 0.00 | 0.00 | 0.07 | 0.16 | 0.08 | 0.04 |
| 30 | Tall Fescue (EF) + Ladino Clover | 0.03 | 0.03 | 0.09 | 0.25 | 0.20 | 0.08 | 0.04 | 0.04 | 0.08 | 0.09 | 0.04 | 0.03 |
| 31 | Tall Fescue (EF) + Red Clover | 0.02 | 0.02 | 0.09 | 0.25 | 0.20 | 0.12 | 0.06 | 0.06 | 0.07 | 0.07 | 0.02 | 0.02 |
| 32 | Tall Fescue (EI) | 0.03 | 0.05 | 0.14 | 0.20 | 0.15 | 0.06 | 0.02 | 0.03 | 0.07 | 0.15 | 0.07 | 0.03 |
| 33 | Tall Fescue (EI) + Ladino Clover | 0.03 | 0.03 | 0.09 | 0.25 | 0.20 | 0.08 | 0.04 | 0.04 | 0.08 | 0.09 | 0.04 | 0.03 |
| 34 | Tall Fescue (EI) + Red Clover | 0.02 | 0.02 | 0.09 | 0.25 | 0.20 | 0.12 | 0.06 | 0.06 | 0.07 | 0.07 | 0.02 | 0.02 |
| 35 | Warm Season Annuals | 0.00 | 0.00 | 0.00 | 0.01 | 0.06 | 0.20 | 0.30 | 0.25 | 0.14 | 0.03 | 0.01 | 0.00 |
| 36 | Wheat | 0.05 | 0.09 | 0.15 | 0.22 | 0.19 | 0.03 | 0.00 | 0.00 | 0.03 | 0.08 | 0.10 | 0.06 |

* Orchardgrass is not well suited to these MLRAs. Plantings usually survive for only a few years. Bluegrass is not adapted to these MLRAs.

**MLRA 136 - Southern Piedmont**

| | Species | Jan | Feb | Mar | Apr | May | Jun | Jul | Aug | Sep | Oct | Nov | Dec |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | Alfalfa | 0.00 | 0.00 | 0.10 | 0.15 | 0.20 | 0.15 | 0.10 | 0.15 | 0.10 | 0.03 | 0.02 | 0.00 |
| 2 | Barley | 0.04 | 0.10 | 0.15 | 0.22 | 0.19 | 0.03 | 0.00 | 0.00 | 0.03 | 0.08 | 0.11 | 0.05 |
| 3 | Bermudagrass, Common | 0.00 | 0.00 | 0.00 | 0.08 | 0.12 | 0.15 | 0.25 | 0.20 | 0.12 | 0.08 | 0.00 | 0.00 |
| 4 | Bermudagrass, Common + Rye | 0.02 | 0.05 | 0.10 | 0.14 | 0.06 | 0.08 | 0.17 | 0.15 | 0.09 | 0.05 | 0.06 | 0.03 |
| 5 | Bermudagrass, Hybrid | 0.00 | 0.00 | 0.00 | 0.08 | 0.10 | 0.15 | 0.25 | 0.20 | 0.15 | 0.05 | 0.02 | 0.00 |
| 6 | Bermudagrass, Hybrid + Rye | 0.02 | 0.05 | 0.10 | 0.14 | 0.06 | 0.08 | 0.17 | 0.15 | 0.09 | 0.05 | 0.06 | 0.03 |
| 7 | Bluestem, Big | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.20 | 0.50 | 0.30 | 0.00 | 0.00 | 0.00 | 0.00 |
| 8 | Bluestem, Caucasian | 0.00 | 0.00 | 0.00 | 0.08 | 0.15 | 0.20 | 0.23 | 0.20 | 0.14 | 0.00 | 0.00 | 0.00 |
| 9 | Corn/Tropical Corn | 0.00 | 0.00 | 0.00 | 0.00 | 0.07 | 0.20 | 0.30 | 0.25 | 0.15 | 0.03 | 0.00 | 0.00 |
| 10 | Crabgrass | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.08 | 0.26 | 0.30 | 0.25 | 0.11 | 0.00 | 0.00 |
| 11 | Gamagrass, Eastern | 0.00 | 0.00 | 0.00 | 0.00 | 0.08 | 0.23 | 0.26 | 0.26 | 0.17 | 0.00 | 0.00 | 0.00 |
| 12 | Flaccidgrass | 0.00 | 0.00 | 0.02 | 0.07 | 0.11 | 0.24 | 0.24 | 0.18 | 0.11 | 0.03 | 0.00 | 0.00 |
| 13 | Indiangrass | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.26 | 0.28 | 0.26 | 0.20 | 0.00 | 0.00 | 0.00 |
| 14 | Johnsongrass | 0.00 | 0.00 | 0.00 | 0.00 | 0.04 | 0.25 | 0.27 | 0.25 | 0.15 | 0.04 | 0.00 | 0.00 |
| 15 | Kudzu | 0.00 | 0.00 | 0.00 | 0.03 | 0.15 | 0.25 | 0.25 | 0.15 | 0.10 | 0.07 | 0.00 | 0.00 |
| 16 | Lespedeza, Annual+Tall Fescue (EF & EI) | 0.01 | 0.04 | 0.07 | 0.11 | 0.10 | 0.15 | 0.16 | 0.14 | 0.07 | 0.10 | 0.05 | 0.00 |
| 17 | Lespedeza, Sericea | 0.00 | 0.00 | 0.00 | 0.05 | 0.15 | 0.30 | 0.25 | 0.15 | 0.10 | 0.00 | 0.00 | 0.00 |
| 18 | Oats | 0.04 | 0.10 | 0.15 | 0.22 | 0.19 | 0.03 | 0.00 | 0.00 | 0.03 | 0.08 | 0.11 | 0.05 |
| 19 | Orchardgrass | 0.03 | 0.06 | 0.15 | 0.25 | 0.20 | 0.06 | 0.00 | 0.00 | 0.04 | 0.10 | 0.07 | 0.04 |
| 20 | Orchardgrass + Alfalfa | 0.02 | 0.02 | 0.11 | 0.16 | 0.20 | 0.14 | 0.05 | 0.05 | 0.06 | 0.10 | 0.07 | 0.02 |
| 21 | Orchardgrass+Red and/or Ladino Clover | 0.01 | 0.02 | 0.15 | 0.25 | 0.18 | 0.08 | 0.03 | 0.03 | 0.05 | 0.10 | 0.07 | 0.03 |
| 22 | Orchardgrass + Tall Fescue (EF) | 0.03 | 0.05 | 0.14 | 0.25 | 0.19 | 0.05 | 0.00 | 0.00 | 0.05 | 0.13 | 0.08 | 0.03 |
| 23 | Orchardgrass + Tall Fescue (EI) | 0.03 | 0.06 | 0.15 | 0.25 | 0.16 | 0.06 | 0.01 | 0.01 | 0.06 | 0.10 | 0.07 | 0.04 |
| 24 | Rescuegrass aka Matua | 0.03 | 0.16 | 0.25 | 0.25 | 0.21 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.06 | 0.04 |
| 25 | Rye | 0.04 | 0.10 | 0.15 | 0.22 | 0.19 | 0.03 | 0.00 | 0.00 | 0.03 | 0.08 | 0.11 | 0.05 |
| 26 | Ryegrass, Annual | 0.04 | 0.06 | 0.15 | 0.30 | 0.25 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.11 | 0.09 |
| 27 | Ryegrass, Perennial | 0.02 | 0.06 | 0.14 | 0.20 | 0.15 | 0.06 | 0.02 | 0.03 | 0.07 | 0.15 | 0.08 | 0.02 |
| 28 | Soybeans + Millet | 0.00 | 0.00 | 0.00 | 0.00 | 0.07 | 0.20 | 0.30 | 0.25 | 0.15 | 0.03 | 0.00 | 0.00 |
| 29 | Switchgrass | 0.00 | 0.00 | 0.02 | 0.06 | 0.15 | 0.20 | 0.23 | 0.20 | 0.10 | 0.04 | 0.00 | 0.00 |
| 30 | Tall Fescue (EF) | 0.02 | 0.06 | 0.14 | 0.20 | 0.16 | 0.07 | 0.00 | 0.00 | 0.07 | 0.16 | 0.09 | 0.03 |
| 31 | Tall Fescue (EF) + Ladino Clover | 0.02 | 0.03 | 0.10 | 0.25 | 0.20 | 0.08 | 0.04 | 0.04 | 0.08 | 0.10 | 0.04 | 0.02 |
| 32 | Tall Fescue (EF) + Red Clover | 0.01 | 0.02 | 0.10 | 0.25 | 0.20 | 0.12 | 0.06 | 0.06 | 0.07 | 0.08 | 0.02 | 0.01 |
| 33 | Tall Fescue (EI) | 0.02 | 0.06 | 0.14 | 0.20 | 0.15 | 0.06 | 0.02 | 0.03 | 0.07 | 0.15 | 0.08 | 0.02 |
| 34 | Tall Fescue (EI) + Ladino Clover | 0.02 | 0.03 | 0.10 | 0.25 | 0.20 | 0.08 | 0.04 | 0.04 | 0.08 | 0.10 | 0.04 | 0.02 |
| 35 | Tall Fescue (EI) + Red Clover | 0.01 | 0.02 | 0.10 | 0.25 | 0.20 | 0.12 | 0.06 | 0.06 | 0.07 | 0.08 | 0.02 | 0.01 |
| 36 | Warm Season Annuals | 0.00 | 0.00 | 0.00 | 0.00 | 0.07 | 0.20 | 0.30 | 0.25 | 0.15 | 0.03 | 0.00 | 0.00 |
| 37 | Wheat | 0.04 | 0.10 | 0.15 | 0.22 | 0.19 | 0.03 | 0.00 | 0.00 | 0.03 | 0.08 | 0.11 | 0.05 |

**MLRA 148 - Northern Piedmont**

| | Species | Jan | Feb | Mar | Apr | May | Jun | Jul | Aug | Sep | Oct | Nov | Dec |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | Alfalfa | 0.00 | 0.00 | 0.09 | 0.15 | 0.20 | 0.15 | 0.10 | 0.15 | 0.10 | 0.04 | 0.01 | 0.00 |
| 2 | Barley | 0.03 | 0.08 | 0.15 | 0.22 | 0.19 | 0.06 | 0.00 | 0.00 | 0.03 | 0.08 | 0.11 | 0.05 |
| 3 | Birdsfoot Trefoil | 0.00 | 0.00 | 0.00 | 0.05 | 0.20 | 0.25 | 0.25 | 0.10 | 0.09 | 0.05 | 0.01 | 0.00 |
| 4 | Bluegrass | 0.00 | 0.00 | 0.10 | 0.20 | 0.25 | 0.15 | 0.00 | 0.00 | 0.10 | 0.20 | 0.00 | 0.00 |
| 5 | Bluegrass + White Clover | 0.00 | 0.01 | 0.11 | 0.15 | 0.25 | 0.20 | 0.05 | 0.04 | 0.07 | 0.12 | 0.00 | 0.00 |
| 6 | Bermudagrass, Common and Hybrid | 0.00 | 0.00 | 0.00 | 0.04 | 0.10 | 0.18 | 0.25 | 0.20 | 0.15 | 0.08 | 0.00 | 0.00 |
| 7 | Bermudagrass, Common/Hybrid + Rye | 0.02 | 0.05 | 0.10 | 0.14 | 0.06 | 0.08 | 0.17 | 0.15 | 0.09 | 0.05 | 0.06 | 0.03 |
| 8 | Bluestem, Big | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.20 | 0.50 | 0.30 | 0.00 | 0.00 | 0.00 | 0.00 |
| 9 | Bluestem, Caucasian | 0.00 | 0.00 | 0.00 | 0.07 | 0.18 | 0.20 | 0.23 | 0.21 | 0.13 | 0.00 | 0.00 | 0.00 |
| 10 | Corn/Tropical Corn | 0.00 | 0.00 | 0.00 | 0.00 | 0.06 | 0.21 | 0.30 | 0.25 | 0.18 | 0.00 | 0.00 | 0.00 |
| 11 | Crabgrass | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.07 | 0.27 | 0.30 | 0.26 | 0.10 | 0.00 | 0.00 |
| 12 | Gamagrass, Eastern | 0.00 | 0.00 | 0.00 | 0.00 | 0.07 | 0.24 | 0.26 | 0.27 | 0.16 | 0.00 | 0.00 | 0.00 |
| 13 | Indiangrass | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.25 | 0.29 | 0.27 | 0.19 | 0.00 | 0.00 | 0.00 |
| 14 | Lespedeza, Annual+Tall Fescue (EF,EI) | 0.00 | 0.05 | 0.07 | 0.11 | 0.10 | 0.15 | 0.15 | 0.12 | 0.08 | 0.10 | 0.06 | 0.00 |
| 15 | Lespedeza, Sericea | 0.00 | 0.00 | 0.00 | 0.05 | 0.15 | 0.30 | 0.25 | 0.15 | 0.10 | 0.00 | 0.00 | 0.00 |
| 16 | Oats | 0.04 | 0.10 | 0.15 | 0.22 | 0.19 | 0.03 | 0.00 | 0.00 | 0.03 | 0.08 | 0.11 | 0.05 |
| 17 | Orchardgrass | 0.01 | 0.06 | 0.14 | 0.20 | 0.19 | 0.08 | 0.04 | 0.05 | 0.07 | 0.10 | 0.05 | 0.01 |
| 18 | Orchardgrass + Alfalfa | 0.00 | 0.04 | 0.12 | 0.17 | 0.20 | 0.12 | 0.07 | 0.10 | 0.09 | 0.05 | 0.04 | 0.00 |
| 19 | Orchardgrass + Ladino Clover | 0.00 | 0.01 | 0.10 | 0.20 | 0.20 | 0.10 | 0.03 | 0.01 | 0.10 | 0.15 | 0.10 | 0.01 |
| 20 | Orchardgrass + Red Clover | 0.00 | 0.01 | 0.10 | 0.20 | 0.25 | 0.13 | 0.06 | 0.05 | 0.10 | 0.08 | 0.02 | 0.00 |
| 21 | Orchardgrass + Tall Fescue (EF) | 0.01 | 0.06 | 0.14 | 0.20 | 0.17 | 0.08 | 0.02 | 0.03 | 0.07 | 0.13 | 0.07 | 0.02 |
| 22 | Orchardgrass+Tall Fescue(EF)+Ladino Cl | 0.01 | 0.05 | 0.14 | 0.22 | 0.18 | 0.08 | 0.03 | 0.03 | 0.07 | 0.12 | 0.06 | 0.01 |
| 23 | Orchardgrass+Tall Fescue(EF)+Red Cl | 0.01 | 0.05 | 0.14 | 0.22 | 0.18 | 0.08 | 0.04 | 0.04 | 0.08 | 0.12 | 0.03 | 0.01 |
| 24 | Orchardgrass + Tall Fescue (EI) | 0.01 | 0.06 | 0.14 | 0.20 | 0.16 | 0.07 | 0.03 | 0.04 | 0.07 | 0.12 | 0.09 | 0.01 |
| 25 | Orchardgrass+Tall Fescue(EI)+Ladino Cl | 0.01 | 0.06 | 0.14 | 0.23 | 0.14 | 0.01 | 0.01 | 0.01 | 0.14 | 0.14 | 0.08 | 0.03 |
| 26 | Orchardgrass+Tall Fescue(EI)+Red Clover | 0.01 | 0.05 | 0.13 | 0.20 | 0.15 | 0.08 | 0.04 | 0.05 | 0.08 | 0.12 | 0.08 | 0.01 |
| 27 | Rescuegrass aka Matua | 0.02 | 0.17 | 0.25 | 0.25 | 0.21 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.07 | 0.03 |
| 28 | Rye | 0.03 | 0.11 | 0.15 | 0.22 | 0.19 | 0.03 | 0.00 | 0.00 | 0.03 | 0.08 | 0.12 | 0.04 |
| 29 | Ryegrass, Annual | 0.03 | 0.07 | 0.15 | 0.30 | 0.25 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.12 | 0.08 |
| 30 | Ryegrass, Perennial | 0.02 | 0.06 | 0.14 | 0.20 | 0.15 | 0.06 | 0.02 | 0.03 | 0.07 | 0.15 | 0.08 | 0.02 |
| 31 | Soybeans + Millet | 0.00 | 0.00 | 0.00 | 0.00 | 0.06 | 0.21 | 0.30 | 0.25 | 0.16 | 0.02 | 0.00 | 0.00 |
| 32 | Switchgrass | 0.00 | 0.00 | 0.00 | 0.00 | 0.06 | 0.21 | 0.30 | 0.25 | 0.16 | 0.02 | 0.00 | 0.00 |
| 33 | Tall Fescue (EF) | 0.01 | 0.07 | 0.14 | 0.20 | 0.16 | 0.07 | 0.00 | 0.00 | 0.07 | 0.16 | 0.10 | 0.02 |
| 34 | Tall Fescue (EF) + Ladino Clover | 0.01 | 0.04 | 0.10 | 0.25 | 0.20 | 0.08 | 0.04 | 0.04 | 0.08 | 0.10 | 0.05 | 0.01 |
| 35 | Tall Fescue (EF) + Red Clover | 0.00 | 0.03 | 0.10 | 0.25 | 0.20 | 0.12 | 0.06 | 0.06 | 0.07 | 0.08 | 0.03 | 0.00 |
| 36 | Tall Fescue (EI) | 0.01 | 0.07 | 0.14 | 0.20 | 0.15 | 0.06 | 0.02 | 0.03 | 0.07 | 0.15 | 0.09 | 0.01 |
| 37 | Tall Fescue (EI) + Ladino Clover | 0.01 | 0.04 | 0.10 | 0.25 | 0.20 | 0.08 | 0.04 | 0.04 | 0.08 | 0.10 | 0.05 | 0.01 |
| 38 | Tall Fescue (EI) + Red Clover | 0.00 | 0.03 | 0.10 | 0.25 | 0.20 | 0.11 | 0.06 | 0.06 | 0.07 | 0.09 | 0.03 | 0.00 |
| 39 | Warm Season Annuals | 0.00 | 0.00 | 0.00 | 0.00 | 0.06 | 0.21 | 0.30 | 0.25 | 0.16 | 0.02 | 0.00 | 0.00 |
| 40 | Wheat | 0.03 | 0.11 | 0.15 | 0.22 | 0.19 | 0.03 | 0.00 | 0.00 | 0.03 | 0.08 | 0.12 | 0.04 |