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THE VALUE OF PASTURE MANAGEMENT

FOR 120 DAY GRAZING SEASON

by

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Though this material was developed for a special purpose, the four step method used to evaluate the problem may be used to evaluate any problem.

Four Step Method of Evaluating a Problem:

    I.   State the problem and the general method to be
          used to solve the problem.

   II.   State the assumptions.

 III.   State the procedure.

  IV.   Convert the assumptions into monetary terms and follow
          the procedure to its logical conclusion.

I.   Statement of the Problem and Method Used to Solve It

Value of Pasture Management

With good agricultural water management on a field of irrigated pasture, the fertilizer program applied and level of pasture management will affect stocking rate, life of pasture stand, and amount of hay harvested as a secondary crop.

The added net return per acre of irrigated pasture resulting from increased stocking rates made possible by improving the level of pasture management will be illustrated. The use of yearling steers grazed at a price on the basis of their gain is the easiest way to illustrate the value of pasture management. This method has a fairly low livestock risk coupled with the lowest capital requirement for any type of livestock enterprise for grazing (harvesting) the pasture.

II. Assumptions

A. Pasture has been established with a suitable grass and legume mix for the soil and climatic conditions.

B. Yearling steers will graze the pasture for 120 days at one of four levels of pasture management:

1. One grazing unit without fertilizer will yield approximately 5 AUMs of grazing per acre.

2. One grazing unit fertilized with 50 units of P and 80 units of N in one application will yield approximately 7 AUMs of grazing per acre.

3. Five grazing units rotated at the proper intervals with 50 units of P applied in the fall and 20 units of N after each grazing period making a total of 80 units of N will yield approximately 13 AUMs of grazing plus some hay. Additional labor needed to move stock will equal 15 minutes per acre for the grazing season. The additional cross fence needed will cost $.50 per acre per year.

4. Daily rotation grazing with the same fertilizer application as 3 above will yield approximately 20 AUMs of grazing plus some hay. An additional hour of labor for moving stock and another $.50 worth of fencing will be needed per acre over 3 above.

C. The yearling will gain two pounds per day per grazing season under all four levels of pasture management if stocked properly.

D. AUMs of grazing converted to stocking rate for yearling steers:

$$\left[\left(\frac{\text{Beginning weight} + \text{ending weight}}{1000\#} \right) \div 2 + 0.1 \right]$$

times months of grazing. Divide this answer into the yields of AUMs of pasture listed in B above for stocking rate of steers.

E. Death loss at 5%.

F. Steers grazed at $.15 per pound of net gain.

G. Farmer will stand the death loss, salt, mineral, and veterinary expenses while stock are on pasture.

III. Procedure

    A. Beginning weight: 500# steers

    B. Estimated rate of gain per day of grazing: 2#/day

    C. Grazing period: 120 days

    D. Ending weight: 500# + (2#/day x 120 days) = 740#

    E. AUMs of forage needed per steer for 120 days of grazing:

$$\left[\left(\frac{500\# + 740\#}{1000\#} \right) \div 2 + 0.1 \right] \times \left(\frac{120 \text{ days}}{30 \text{ days}} \right) =$$

$$\left[(1.24 \div 2) + 0.1 \right] \times 4 =$$

$$(0.62 + 0.1) \times 4 =$$

$$0.72 \times 4 = 2.88 \text{ AUMs}$$

    F. Death loss estimated at 5%

    G. Livestock costs:

        Salt and minerals $1/head
        Vet. expense: $2/head

        TOTAL steer cost $3/head

    H. Livestock receipts:

$$\left[740\# \times 95\% \ (5\% \text{ death loss}) - 500\# \right] \times \$.15/\# =$$

$$(703\# - 500\#) \times \$.15/\# =$$

$$203\# \times \$.15/\# = \$30.45/\text{head}$$

    I. Livestock returns over livestock costs:

        $30.45/head - $3/head = $27.45/head

    J. Value of pasture management per acre:

        1. Divide the AUM values in assumption B by 2.88 AUMs to determine the per acre carrying capacity for each level of management.

        2. Multiply the answers in 1 above times $27.45/head to determine the gross return to pasture for each level of management.

3. Subtract the answers in 2 above for each higher level of management from the lowest level to determine the added gross returns to pasture as a result of improved management.

4. Calculate the added pasture costs which will be incurred for each higher level of management.

5. Subtract the answers in 4 above from the answers in 3 above to determine the increased net return to pasture from improving pasture management.

6. Take the difference in net return between each step to illustrate the marginal value of improving pasture management going from 5 AUMs to 7 AUMs; from 7 AUMs to 13 AUMs; and from 13 AUMs to 20 AUMs.

K. Calculations illustrating the value of pasture management per acre:

Assumptions B1, B2, B3, B4	Management Level			
	5 AUMs	7 AUMs	13 AUMs	20 AUMs
1. Steer equivalent per acre per grazing season	1.74	2.43	4.51	6.94
2. Returns per steer ($27.45) times steer equivalent	47.76	66.70	123.80	190.5
3. Added gross returns to pasture from management		18.94	76.04	142.74
4. Added Costs:				
50 units of P @ 10¢/unit		5.00	5.00	5.00
80 units of N @ 12¢/unit		9.60	9.60	9.60
Fert. Applic. @ $1/Applic.		1.00	5.00	5.00
Fence			.50	1.00
Labor @ $1.50/hr.			.38	1.88
Total Added Costs		15.60	20.48	22.48
5. Increased net return from management		3.34	55.56	120.26
6. Marginal value of management per acre:				
From 5 AUMs to 7 AUMs		3.34		
From 7 AUMs to 13 AUMs			52.22	
From 13 AUMs to 20 AUMs				64.70