UNIVERSITY OF IDAHO
College of Agriculture

FERTILIZING IRRIGATED PASTURES

Fertilizer Makes the Difference

IDAHO Agricultural Extension Service

Bulletin 452
February 1967

FERTILIZING IRRIGATED PASTURES

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There are 700,000 acres of cropland pasture in Idaho, of which 500,000 are irrigated and capable of producing 3 to 6 tons of air-dry hay per acre. Yet only 1 to 4 tons per acre are being produced, depending on area and management practices. Recent research and demonstrations on fertilization of irrigated pastures show that low fertility is a main factor restricting yield and quality of feed produced.

A "Testing Tells" project on pasture fertilization has been carried out by the University of Idaho and the Northwest Plant Food Association during the past three years. Results described are those found during this study.

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Factors Affecting The Fertility Program

1. Whether a pasture is predominantly grass or legume will govern the kind and rate of fertilizer needed. When a pasture contains 40 percent or less of legume, nitrogen fertilizer is a must to give desired production and quality of feed. If a pasture contains 40 percent or more of a legume, phosphorus and potassium will be the main concern.

2. The existing fertility will also determine kind and rate of fertilizers needed. When soils are low in available phosphorus, potassium, sulfur or other essential nutrients, these will be needed. A soil analysis will determine whether these nutrients are necessary. On most soils in Idaho, nitrogen and phosphorus are the two nutrients mainly required. Contact your county agricultural extension agent for soil analysis information.

3. Area or production potential will influence fertility needs. Some areas may have up to 160 days of frost-free growing season, capable of producing 6 tons or more of air-dry forage per acre, whereas other areas may have only 70 to 110 days frost-free and will produce only 2 to 4 tons of air-dry hay per acre. With a longer growing season, more fertilizer will be needed to supply nutrients for the extra growth. Consequently, rates of fertilizer are usually based on number of cuttings or grazing periods in a specific area.

NITROGEN RATES

On irrigated pastures predominantly grass, investigations indicate that 50 to 60 pounds of nitrogen per acre per cutting will give good returns for the money invested. An example of nitrogen effects on yield and quality of forage produced on the Lane Dairy near Meridian is shown in Table 1.

Table 1. Effect of Nitrogen on Yield and Quality of Forage Produced.

Pounds N/A	Tons per acre[1]	Tons per acre increase	Cost per ton extra forage	Percent Protein
0	2.81	—	—	12.6
150[2]	5.07	2.26	$9.30	12.6

[1]Air-dry wt., three cuttings of forage.
[2]50 lbs. N, applied in spring, 50 lbs. after first and 50 lbs. after second cutting.

On this pasture containing 10 to 15 percent legume, 150 pounds nitrogen per acre in split applications produced additional forage analyzing 12.6 percent protein at a cost of $9.30 per ton, a low-cost high-quality feed.

In areas where only one late cutting of forage is obtained, nitrogen rates up to 100 pounds per acre have given good returns. This is shown on the Mahaffey ranch near Salmon in Table 2. On this straight grass pasture, 100 lbs. nitrogen per acre produced 2.20 tons extra forage per acre at a cost of $6.35 per ton. Protein was also increased by 2.7 percent, giving a more desirable quality feed.

Table 2. Effect of Nitrogen on Yield and Quality of Forage Produced.

Pounds nitrogen per acre	Tons per acre air-dry hay	Tons per acre increase	Percent Protein
0	1.20	—	8.6
50	2.35	1.15	10.8
100	3.40	2.20	11.3

Are you satisfied with less than one ton of forage per cutting per acre? You can fertilize and raise yields up to 2 to 3 tons per acre. Center pile—unfertilized forage in pasture near St. Anthony, Idaho. Right and left—additional forage from fertilizer. Additional hay was about 1.75 tons per acre with an increase in both protein and phosphorus content.

Caution

On pastures containing a high percentage of legumes, nitrogen will reduce the quantity of legume in the forage. This effect is more severe from split applications.

PHOSPHORUS RATES

On all pastures where soils are low in available phosphorus, 80 to 120 pounds P_2O_5 per acre should be applied annually until a desirable soil test level is obtained; then rates of 40 to 60 lbs. P_2O_5 per acre

per year should be sufficient to maintain yields and quality of forage. Phosphorus will help maintain legume in forage and produce a higher quality feed. An example of effects of phosphorus on yield and quality of forage is shown in Table 3, on Jarvis ranch near Donnelly.

Table 3. Effect of Phosphorus on Yield and Quality of Forage.

Pounds per acre		Tons[1]	Tons per acre	Percent		
N	P_2O_5	per acre	increase	Protein	Phosphorus	Legume
0	0	1.35	—	12.0	0.16	45
100	80	2.96	1.61	13.1	0.23	23
0	80	2.64	1.29	14.2	0.24	65

[1]One cutting, air-dry forage.

On this pasture phosphorus increased legume content, the amount of protein and phosphorus in the feed, and gave similar yields to forage fertilized with both nitrogen and phosphorus. These effects were due to the increase in legumes. Note reduction in legume from nitrogen fertilizer. The extra 1.29 tons forage was produced for $5.58 per ton.

Other Plant Nutrients

The need for potassium fertilizer can be determined from a soil analysis. When needed, apply 80 to 120 pounds of K_2O per acre per year. Investigations on other nutrients have shown a need for sulfur and boron on acid soils. On acid soils having a low supply of these two nutrients, applications of 20 pounds sulfur and 1 to 3 pounds boron per acre about every third year are suggested. This requirement may be met by applying 200 pounds of borated gypsum every 2 or 3 years.

Fall or early spring application of nitrogen promotes early spring growth of forage, provides earlier grazing and higher quality feed.

Time of Application

Nitrogen fertilizers may be applied in fall or spring or as split applications where there is more than one cutting or grazing period. Early spring applications are suggested in areas and soils where loss of nitrogen may occur during winter due to poor drainage conditions, excessive leaching, ponding of water or soil erosion.

Fall applications are preferred for other nutrients.

FERTILITY TIPS

High-yielding, quality forage is produced by a sound fertility program.

Remember:

1. Grass forage needs nitrogen fertilizers to give high yields of quality feed.
2. Legume population will be reduced by nitrogen fertilization and increased by phosphorus and potassium when these nutrients become low in soil.
3. Test your soil for phosphorus and potassium needs.
4. Split nitrogen applications if there is more than one cutting or grazing period.
5. Make first application of nitrogen in spring if soil conditions such as poor drainage, leaching, ponding or erosion are present.
6. Apply other nutrients needed in fall of year.
7. Returns from fertilizer in yield and quality of forage are greatest when other management practices are at their best; these include having a desirable grass-legume forage, frequent but not over-irrigation, and controlled grazing.

Published and distributed in furtherance of the Acts of May 8 and June 30, 1914, by the University of Idaho Agricultural Extension Service, James E. Kraus, Director; and the U. S. Department of Agriculture, Cooperating. 5M 2-67