



Farm Views

Fertilizing with Phosphorus

The extension office receives several calls each spring asking about proper phosphorus fertilizer application timing and methods. Many times, questions stem from a misunderstanding of the differences between how phosphorus and nitrogen react in the soil and how each are measured by a soil test.

Although nitrogen can be applied in various forms initially, eventually all nitrogen is converted to nitrate in the soil. Nitrate is not attracted to clay or other particles in the soil and therefore remains in the soil solution where it can be utilized by plants. Post growing season tests for nitrate nitrogen (NO₃-N) in the soil test are therefore measuring essentially all of the available nitrogen in the soil.

Phosphorus fertilizer, on the other hand, is completely water soluble (completely plant available) when manufactured, but it does not remain this way very long after it is applied to the soil. This process of available phosphorus being made unavailable to plants is called "phosphorus fixation". Tests which estimate the amount of phosphorus that is available for uptake by plants are only measuring a small fraction of the total phosphorus in the soil.

Nebraska soils are generally well supplied with phosphorus. Total phosphorus contents average about 4,700 lbs of P₂O₅ per acre for each foot of soil. Assuming a root zone of six feet, most Nebraska soils contain about 28,000 lbs of total phosphorus as P₂O₅. If our crops could use all of this phosphorus, we would have a 500 year supply for growing 150 bushels of corn per acre per year. Unfortunately, only a very small amount of this total phosphorus supply is available each year because it must undergo weathering before it becomes available to plants. Even with 28,000 lbs of total phosphorus present in the root zone, phosphorus may be deficient for maximum crop yields. Our problem is to determine the amount of phosphorus available to a crop and then use phosphorus fertilizers most effectively to maximize economic crop returns.

Soil test values are based on lab tests which use chemical processes to extract phosphorus from the soil sample. The result of these extraction techniques are reported as a concentration of available P₂O₅ expressed in parts per million (ppm or mg/kg). Several different chemical tests

are used to extract phosphorus. The proper test for a given soil sample depends on the chemical properties of the soil, especially free lime and soil reaction (pH). In all cases, the tests themselves would have no value unless they were associated with field studies by soil scientists who correlate test data with yield response to phosphorus fertilization.

Phosphorus is only slightly mobile in the soil. Generally speaking, plant roots must be in contact with the soil phosphorus in order to extract it from the soil. Therefore, phosphorus must be present in the soil where plant roots are active and growing. This means that phosphorus applied to the soil surface will not be utilized well by most plants because plant roots don't grow on the soil surface or in the upper inch or two of the soil profile because the soil surface tends to dry out quickly.

For annual crops, such as wheat, corn, milo, or soybeans; the most efficient way to apply phosphorus is to apply it in a band at the time of planting. An alternative is a broadcast application before planting when it can be incorporated into the soil. Generally, band applications of phosphorus fertilizers require only one-half the rate of phosphorus per acre to achieve the same yield results as broadcast and incorporated applications because the more concentrated band is not converted to unavailable forms (fixed) as quickly.

Topdressing phosphorus can be effective for perennial crops such as alfalfa and bromegrass. These crops have very vigorous crowns from which many fine roots originate, thus phosphorus uptake can occur from the upper portion of the soil profile. Make applications in early spring when crown growth is most active and soil surfaces tend to be moist.

On new alfalfa plantings, if the soil pH is neutral (pH 7.0) or below, a common practice is to apply triple the annual rate of phosphorus fertilizer and incorporate it into the soil prior to seeding. This should be effective for three to four years for alfalfa growth. For high lime soils, with high rates of phosphorus fixation, annual or every-other-year topdress applications are suggested for alfalfa.

For more information, see "Using Phosphorus Fertilizers Effectively," (NebGuide G82-601-A), by E.J. Penas and D.H. Sander, Cooperative Extension Soils specialists. (TD)

See no weevil? Scout your alfalfa to make sure!

The alfalfa weevil is the most consistent insect pest attacking first-cutting alfalfa. To prevent economic losses, proper management of this pest is essential during years when weevil populations are high. The best way to manage this pest is to scout first-cutting alfalfa fields early. Don't wait until you see your neighbor spraying his field before you take a good look at yours.

If you haven't looked at your alfalfa yet, you should be looking NOW. Earliest damage looks like tiny shot holes on terminal foliage and buds. Look for small, green or yellow larvae, about 1/8 inch long, with black heads and a light-colored stripe down the middle of the back. Full grown larvae, are about 3/8 inch long.

The following scouting and decision-making method can be used to help you determine the need for alfalfa weevil management procedures.

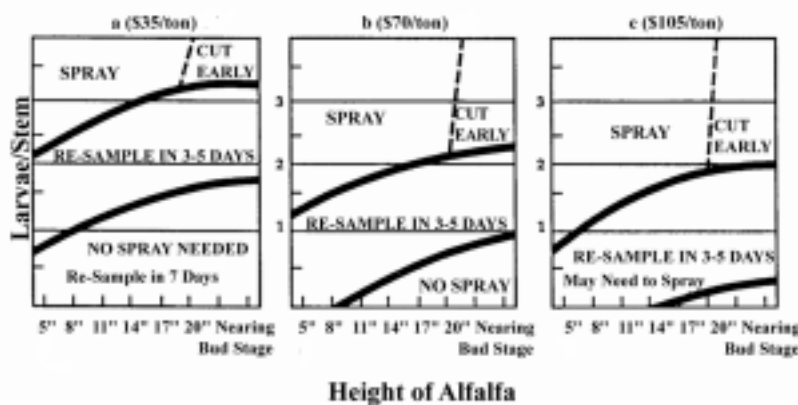
Stem Count Decision

Method: Carefully break off cut 30-50 stems at ground level and put the stems in a steep-sided bucket. Be sure to select stems randomly from different

parts of the field. Count the stems and determine their average height above the ground. Count the larvae, and compute the average number of larvae per stem. Use the accompanying charts to determine what management action to take. Your choices are to spray immediately, resample in 3-5 days, do not spray, or to cut your alfalfa early. After bud stage, it is probably more profitable to cut the alfalfa than to treat with an insecticide. Use the accompanying charts to determine your action thresholds. The chart you use depends on the price of hay or quality of hay you wish to grow.

Stubble Treatment: Frequently, the alfalfa weevil populations can be adequately reduced by timely cutting of the hay. This saves the expense of an insecticide treatment. After cutting and removing the hay, thoroughly examine the stubble for evidence of further feeding. If normal regrowth does not appear after 5-7 days, treating the stubble with a registered insecticide treatment may be necessary. When selecting a treatment, be sure to consider the harvest interval, the number of days between treatment and the earliest you can cut your alfalfa. This information is on the insecticide label. (BPO)

ALFALFA WEEVIL STEM COUNT METHOD



Reader response - I would like an article about starting a commercial rabbit business.



The Lancaster County Extension web pages contain several links to information on various specialty animal enterprises including rabbit production. For those with access to the internet the specialty animal production page can be found at: <http://www.ianr.unl.edu/ianr/lanco/ag/livestok/livespec.htm>.

The following is reproduced from **Starting a Rabbit Enterprise** by Dr. Tom W. Smith, Professor and Extension Poultry Specialist, Mississippi State University.

Listed below are some points one should take into account when considering whether to start a commercial rabbitry enterprise.

I. Advantages

- A. Supplemental income
Excellent enterprise to provide extra income in spare time.
- B. Small land requirement
A substantial rabbitry can be operated on less than one acre of land.
- C. Labor
Less physically demanding than many other agricultural enterprises.
- D. Earthworms
Additional income is often earned by producing and selling earthworms.

II. Disadvantages

- A. High initial investment
Investment for a new facility and breeding stock usually amounts to about \$70 to \$90 per doe unit (building, cages, equipment, and breeding stock.)
Investment can be reduced somewhat if a presently existing building can be adapted for rabbit housing. (Materials and breeding stock in this situation may only amount to \$30 to \$40 per doe unit.)
- Since the rabbit industry is not as developed as most other agricultural enterprises, it is considered a high-risk investment. The markets are not as secure and may not be available when market time approaches. This can be overcome if the producer develops a clientele group to purchase his rabbit products.
- B. Net income averages only about \$20 to \$22 per doe per year.
Annual income for a full-time family enterprise is about \$8,000 to \$13,000 annually.
- C. Management problems invariably plague the beginner rabbit producer.
Maximum production is seldom achieved during the first few years.
- D. Rabbit production is an everyday enterprise with few days off.
Low margins do not often allow for the hiring of temporary labor during this time.

Personal Impressions

1. Raising rabbits is not suited for everyone. To be successful, the producer must be able to give careful attention to small details. Record keeping is a primary requirement and duty.
2. Rabbit production at the present time is not an enterprise that the producer can rely upon initially as a full-time occupation.
3. Prior to investing in facilities, equipment, and breeding stock, determine where the market is and how many rabbits the market can support.

Recommendations

It is recommend that anyone interested in raising rabbits for the first time get into the business slowly, perhaps with 10 breeding does. If, after learning how to manage the business, you see that you want to pursue it further, you can do so at a rate to suit your financial resources. If on the other hand, you find that you are not suited for the rabbit business, you can sell equipment and stock with little or no financial loss.

Remember, keep both good financial and production records or you will not know if you are making progress and a profit or whether you are losing money. (TD)

FOR ALL THE INTERNET USERS OUT THERE!

Lancaster County Extension Office has a new, shorter home page address:

www.lanco.unl.edu

Some shortcuts:

www.lanco.unl.edu/food

www.lanco.unl.edu/ag

www.lanco.unl.edu/enviro

www.lanco.unl.edu/nebline

www.lanco.unl.edu/hort

www.lanco.unl.edu/family

www.lanco.unl.edu/4h

www.lanco.unl.edu/contact

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