

HORTICULTURE

Balanced fertilization program supports pecan growth

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Fertilization is just one pecan management practice that helps maximize crop production (load) and provides optimal tree maintenance. Proper fertilization encourages growth of shoots and leaves, which is essential for increasing crop load and decreasing tree stress. During poor crop years, fertilization is the one practice that producers tend to overlook.

In the past, it has been suggested that when nutrients are applied, those nutrients are used for the current year's crop. New research conducted by Mike Smith, Ph.D., at Oklahoma State University suggests that nitrogen applied during the current year is used by trees for the following year's crop. Generally, during heavy crop years, growers would apply fertilizer multiple times to ensure that nitrogen was available for uptake since it is typically the most limiting nutrient.

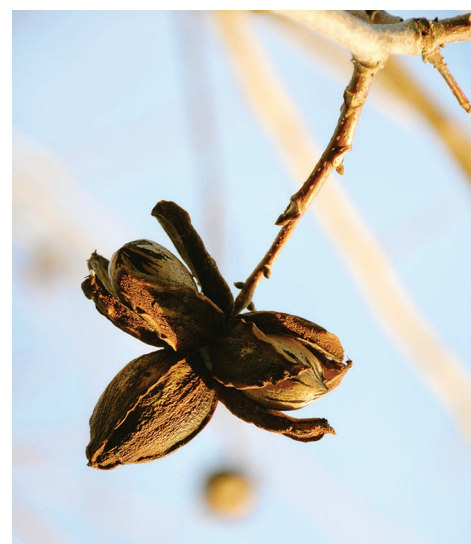
Currently, nitrogen is recommended as a single application, though split applications are recommended in areas that are prone to flooding. Some have recommended fertilizing an additional two to three times per year for certain varieties during heavy crop years; however, no research has been conducted to confirm this information.

New research has been conducted evaluating the efficiency and absorption of nitrogen and other essential nutrients that affect pecan growth and production.

Research indicates that nitrogen storage in plant tissues is the primary source of nitrogen used during initial spring growth in pecans, and that nitrogen absorption rapidly increases when stored nitrogen pools are nearly depleted. This means nitrogen demand is greatest when nitrogen stores are being replenished and this normally occurs in the early spring during periods of rapid growth and leaf expansion. In fact, researchers estimate applied nitrogen uptake in trees ranges between 12 and 27 percent. It has also been reported that applied nitrogen is mainly transported to stored nitrogen pools that will be used during the next growing season. The combination of these studies suggests that for trees to maintain a balanced nutrient level, the best time to fertilize is before budbreak (late February to early March).

Even though nitrogen is critical, remember that a balanced fertilization program is crucial for healthy productive trees. Therefore, growers need to manage the following nutrients to ensure a successful orchard:

- **Phosphorus (P)** is important for nut



growth, minimization of leaf scorch (imbalance of N:P) and early defoliation. Deficiency in P is rare; however, adequate levels are needed to maximize production.

- **Potassium (K)** is used in transporting carbohydrates and is directly linked to kernel oil content. During heavy crops, K shortage can lead to leaf scorch and early defoliation. Shortages are common and require several years to correct.
- **Zinc (Zn)** deficiencies are common in all areas of pecan production. Trees in soils with low pH will respond to soil-applied Zn. Trees in soils with a higher pH will not respond to soil-applied Zn and require foliar sprays. ▶

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- **Boron (B)** is more of a problem in excess than in shortage. Irrigation water should be tested for high B levels.
- **Manganese (Mn)** deficiencies have been identified along the Red River and greatly decrease pecan production in affected areas.
- **Nickel (Ni)** is utilized in converting urea to ammonia. Therefore, if urea

is used in an orchard with nickel deficiency, urea will not be converted properly and will result in toxicity. To ensure that you have healthy and properly fertilized pecan trees, it is recommended that you collect leaf samples for analysis in July. The level of nutrients that will be needed the following year depends on the results

of the analysis. Cumulative results of yearly leaf samples will enable optimal management of the nutritional levels of trees, potentially decreasing input costs over time.

For more information on how to fertilize pecans or how to take a proper leaf sample, contact the Noble Foundation at 580-223-5810. ■