HEALTHY FOOD SYSTEMS • HEALTHY ENVIRONMENTS • HEALTHY COMMUNITIES • HEALTHY CALIFORNIANS

University of California
Agriculture and Natural Resources
Making a Difference for California

The Green Scene

UCCE

May 2023

Meetings and Announcements

Spring 2023 Horticulture Tour…

…has now been accomplished. We saw nine major gardens in England and Wales, beginning with the RHS flagship garden at Wisley, and then five in Scotland, plus sites of historical and archeological interest, such as the Cathedral at Salisbury, the Ring of Brodgar and the neolithic village of Skara Brae. We had rain only one day. I have already been asked about a tour next year and a possible destination, but it is too soon to say what we might do.

Nitrogen Application for Landscape Plants

The nutrient elements found in greatest quantity in plants are carbon, hydrogen and oxygen, all of which are obtained from air and water. After these, nitrogen is the nutrient most needed, and has marked effects on plant growth, especially in maintenance of green color and shoot growth rate. In most landscapes, home orchards and gardens, nitrogen is the limiting nutrient.

In the natural ecosystem, nitrogen is released from decaying organic matter in the form of the ammonium ion (NH_4^+), which is converted to nitrite (NO_2^-), and then to nitrate (NO_3^-) by bacteria. This conversion process is temperature dependent, slow in winter but rapid in summer. Most plants absorb nitrogen in the nitrate form. Because of the negative charge of the nitrate ion, it is not bound to soil particles, which also have negative charges. Nitrogen is easy to add from fertilizer, but nitrate can leach through soil and contaminate ground water. Therefore, it is best to add nitrogen in increments according to plant needs. Most Kern County soils contain little nitrogen reserve because of their low organic matter contents. Compost or other organic materials also contain nitrogen, but at low concentrations of 1-5%, and nitrogen from these is released slowly.

Landscape plants and turfgrasses have varying needs for nitrogen. Plants which grow rapidly, or from which parts are removed through mowing or for harvest, usually have a higher need for nitrogen than do shade trees and shrubs. A useful reference number in horticulture is the general rate of nitrogen application, which is 1 pound of actual nitrogen per 1000 square feet. By using this general rate, the rate of application of common fertilizers can be calculated. The first number on a fertilizer label is percentage nitrogen contained. For example, for ammonium sulfate, 21-0-0 so containing 21% nitrogen, 1 / 0.21 = 4.76, or about 5 lb ammonium sulfate needed to supply 1 lb nitrogen. Therefore, about 5 lb ammonium sulfate per 1000 sq ft would be needed to supply nitrogen at the general rate.

Although fertilizers vary in nitrogen content and the content of other nutrients, differences of a few percentage points are usually unimportant. Although fertilizers may be marketed with photos of citrus, tomatoes, watermelon, etc., on the package, the fertilizer materials are often similar from product to product. It is not necessary to buy a different fertilizer for every plant in the landscape! Also, fertilizers are often more expensive for various conveniences, e.g., forming the product into stakes or providing nitrogen in a slow-release form.

For common landscape and garden situations, the following nitrogen (N) rates are suggested:

- For turfgrasses, the N rate can be 1-2 lb actual N/1000 sq ft per growing month. This is a high rate used for intensively maintained turfgrasses such as hybrid bermuda. For low-maintenance turfs, a single application of N at 1 lb actual N per 1000 sq ft may be made in spring, and an additional application in fall. For home lawns, nitrogen can be applied at 1 lb actual N per 1000 sq ft periodically during the growing season; for example, one application every 6 – 8 weeks, about the time it takes quick-release fertilizers to be consumed. In parks, perhaps no nitrogen is applied.
- For vegetable gardens, nitrogen may be applied pre-plant at 1 lb actual N/1000 sq ft and tilled in, followed by another application during fruiting.
- For fruit trees, a single application of 1-2 actual N per 1000 sq ft beneath the tree crown is usually sufficient, if desired. That application may be split, with around half at bloom time and half a couple of months later. Fruit trees generally need an N application every year; shade trees do not.
- Most landscape plants do not need annual N fertilization when mature. It is usually best to maintain them at a slow growth rate so the landscape does not become overgrown and need premature replacement. When landscapes are newly established, one or two applications of N per year at 1 lb actual per 1000 sq ft may be helpful in bringing the landscape to maturity.

John Karlik Environmental Horticulture/Environmental Science