Integrated
Cranberry Crop
Management
for Wisconsin

Cranberry

Crop Management Newsletter

Volume XVII
Number 8
Aug 20, 2003

Contents:

FOLIAR FEEDING

Do plants do better if "fed" through leaves or through roots? "Several popular fertilizer products available to growers promote leaf feeding as superior to soil application of nutrients," explains Sherry Combs, director of the University of Wisconsin-Madison/Extension Soil and Plant Analysis Laboratory and UW-Extension soil specialist.

"Advertised claims include more efficient nutrient uptake, bigger fruits and vegetables, ability to `spoon-feed' plants and better use of nutrients by the whole plant," she explains. "In reality, foliar `feeding' is not superior, but some crops under certain growing conditions do respond better to applying nutrients to leaves," Combs adds.

Soluble liquid fertilizers are used when applying nutrients to leaves. This results in rapid absorption and has the advantage of near-immediate correction of nutrient deficiencies. "However, leaf fertilization is not the best choice when applying large quantities of nutrients because of foliage burn," Combs adds. "Because of the small amount of nutrients applied and remaining on leaves, benefits often are only temporary. Repeated applications may be needed," she says.

Fertilizing leaves of fruit crops and ornamentals can help correct certain deficiency symptoms. "Roses commonly exhibit iron and manganese deficiency—interveinal yellowing—when grown on high pH soils," Combs says. High pH soils lacking in iron and manganese make it difficult for certain plants, such as roses, to get enough micronutrients from the soil to support good growth. "Applying iron or manganese to the leaves of plants supplies these nutrients directly and avoids the problem," Combs adds.

Plants take in nutrients applied to foliage through the leaf stomata, the cell openings of plant leaves. This process occurs most rapidly during the first hour after application.

"For leaf absorption to be most effective, applications should be made when temperatures are cool and humidity is high, such as in the early morning or early evening," Combs says. "Applications during these times are also less likely to cause leaf burn."

"Feeding" leaves should not take the place of traditional soil application of macronutrients such as nitrogen, phosphorus and potassium. "Trying to apply the quantity of macronutrients required by plants can cause severe leaf burn," adds Combs. "In fact, a large portion of the nutrients applied to the leaves of

plants falls on the soil surface. These nutrients are then absorbed by plant roots in the same manner as nutrients initially applied to the soil surface."
Sherry Combs, UW-Soil Science

SPRAYER NOZZLES

Nozzles are important in controlling the volume of pesticide applied, the uniformity of application, the completeness of coverage, and the degree of drift. While many different types of nozzles are available, each one is designed for specific applications. Regular flat-fan, flood, and whirl chamber nozzles are preferred for weed control. For minimum drift, flood, whirl chamber, and raindrop nozzles produce large droplets.

A variety of materials are used in the manufacture of hydraulic sprayer nozzles. Brass is inexpensive, but it wears rapidly causing a change in application rate and spray pattern. The worn nozzles usually have a higher flow and a greater concentration of spray directly below the nozzle. Nylon has good corrosion resistance, but is only fair in abrasion resistance and may swell when exposed to some liquids. Stainless steel nozzles are particularly resistant to abrasion. Nylon nozzles with stainless steel inserts offer an alternative to solid stainless steel at a reduced cost. Disk-type, hollow-cone nozzles are available in tungsten carbide which is highly resistant to corrosion and abrasion. Regular flat-fan nozzles are available in ceramic, another highly resistive material. Hardened plastic nozzles are very resistant to abrasion but not as expensive as tungsten carbide or ceramic nozzles.

Flat-Fan. Flat-fan nozzles produce a flat spray pattern with tapered edges and are widely used for broadcast spraying herbicides. Because the outer edges of this pattern receive less volume, adjacent spray patterns must overlap 30% to 50% depending on spray angle to ensure uniform coverage. To achieve 50% overlap, the nozzle must spray an area 50% wider than the nozzle spacing on the boom. For example, nozzles spaced on 20-inch centers must each spray an area 30 inches wide to get 50% overlap. When overlap is required flat-fan nozzles must be turned slightly so that the patterns don't spray into each other, but only overlap.

The normal operating pressure for most flat fan nozzles is 30 to 60 psi, but low-pressure flat-fan nozzles can operate at pressures from 10 to 20 psi. Lower pressures create larger droplets and reduce drift. Common angles of discharge are 65, 80, and 110 degrees. The angle of discharge and nozzle spacing determine the proper nozzle height for uniform application.

Nozzle sizes are based on the size of nozzle opening. Manufacturers use a numbering system which describes the nozzle discharge flow for some standard pressure. Most flat-fan nozzles have a single discharge opening, but several flat-fan nozzles have two openings. In one type, the discharge from one opening is directed slightly rearward. This provides improved pesticide coverage in dense foliage. In another type, the discharge from one opening is directed downward and to the other side. The overlapping patterns are designed to produce a uniform, yet very wide spray pattern.

Even Flat-Fan. Even flat-fan nozzles are designed to provide uniform coverage across the entire width of the spray pattern. These nozzles are quite similar to the regular flat-fan nozzles and used primarily for band applications over a crop row. Their normal operating pressure is from 30 to 40 psi and the band width is dependent on the nozzle height and nozzle spray angle.

Flood Flat-fan. Flood flat-fan nozzles produce a wide-angle pattern and function well when broadcasting herbicides. Optimal operating pressures are 10 to 25 psi.

Pressure changes on flood flat-fan nozzles affect the angle and width of the spray pattern more than with regular flat-fan nozzles. The width of the spray pattern increases with pressure increase. The discharge can be directed horizontally backward for a uniform pattern or downward for minimal drift. Spray patterns should overlap 100% for uniform distribution. The nozzle spacing should be half the area covered by a single nozzle.

Hollow-cone. Hollow cone nozzles are frequently used to apply insecticides and fungicides where pesticide coverage of leaves is important and when drift is not a major concern. At pressures of 40 to 100 psi, these nozzles produce many small droplets that penetrate plant canopies and cover both sides of the leaves more effectively than fan nozzles. Drop tubes and other fittings also permit improved spray penetration.

Whirl Chamber. The whirl chamber nozzle has a whirl chamber just above the conical outlet. At the recommended pressure of 5 to 20 psi, these nozzles produce large droplets. The primary use of these nozzles is herbicide application.

Raindrop. The raindrop nozzle is designed primarily to reduce drift. When operating at pressures of 20 to 60 psi very large droplets are produced. These nozzles are also used for herbicide application. For broadcast application, these nozzles must be directed 30 to 45 degrees forward or backward from the horizontal to obtain uniform distribution.

Air-shear nozzles. Air shear nozzles are commonly used on air blast sprayers or mist blowers. The air passing through the nozzles atomizes the spray mix. Air-shear nozzles do not wear as quickly as other nozzles, primarily because they have large orifices.

Adapted from Pest Management Principles for the commercial applicator—Fruit Crops.

REPORTING ORBIT USE

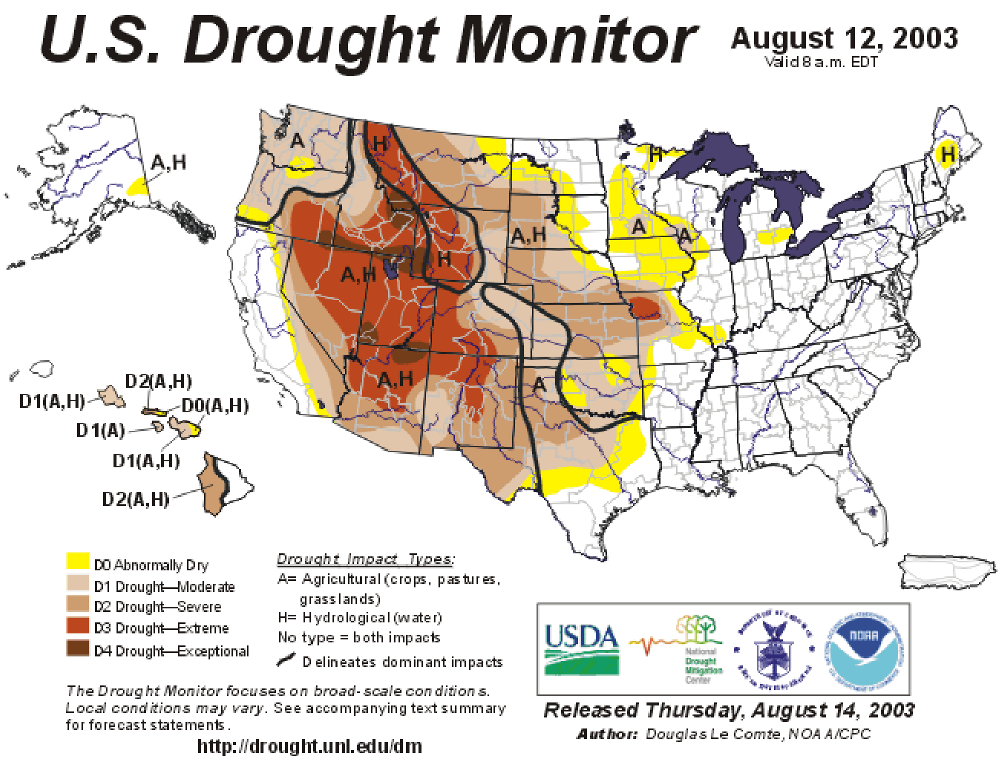
The Section 18 exemption for the fungicide ORBIT (propiconazole) expired on July 31 and now is the time to report use of this product in Wisconsin. All cranberry growers in Wisconsin will soon receive a form to record their use of Orbit. If you used ORBIT, you MUST provide the information requested on the form and return it to me no later than October 31, 2003. Reporting ORBIT use is required by the EPA, and future Section 18 or regular labels for ORBIT will not happen unless we provide them with these data.

If you have questions about reporting fungicide use, call me at 608-265-2041, or e-mail me at psm@plantpath.wisc.edu.

Patty McManus, UW-Madison Extension Plant Pathologist

Drought

The map on the back page shows the extent of drought this year in the mountain states and Midwest. Short term forecasts are for drought conditions to continue. Drought combined with heat makes it difficult to keep crops irrigated. During hot dry weather irrigating cranberries in the mid-day to afternoon make sense to replace moisture that is lost to evaporation as well as to cool the vines from the colder water and evaporative cooling. Hopefully rain will come soon to provide sufficient water for harvest and flooding.



Wisconsin Cranberry Crop Management Newsletter
Department of Horticulture
1575 Linden Drive
Madison, WI 53706-1590

UW Extension

Nonprofit Org.
U.S. Postage

PAID

Madison, WI
Permit No. 658