The application of s-ABA to pot chrysanthemums delayed the onset of wilting (left to right, 0 and 300 parts per million).

New products, uses provide plant growth regulator alternatives

By Joyce Latimer and Brian Whipker

Researchers evaluate the latest plant growth regulators and the best methods of applying new and existing products.

AS NEW PLANT GROWTH regulator products come to market, product labels are updated and new or refined methods of applications are introduced, this is a good time to review some of the recent changes.

Product updates

s-ABA. Abscisic acid is a naturally occurring hormone in plants that signals the leaf stomata to close (stomata are leaf openings where gases and water exchange with the atmosphere). s-ABA (abscisic acid [VBC-30074]), is a new product from Valent BioSciences Corp. that has a three-year experimental-use label to evaluate its enhancement of crop shelflife under commercial conditions. Commercial registration of s-ABA is expected by late 2009 or early 2010.

When applied to finished plants, s-ABA reduces water loss and controls water use. This results in reduced transpiration and delayed wilting.

s-ABA can be applied as a drench or as a foliar spray. For drenches applied by hand, through a drip line or via subirrigation, use rates can be up to 500 parts per million. Drench just enough volume to fill the pot.

For foliar sprays or sprinkler applications, use rates up to 2,000 ppm at an application volume of 2-3 quarts per 100 square feet of bench space. For optimal response, apply under conditions that maximize uptake, early in the morning or under conditions of high relative humidity and moderate temperatures. Do not overhead irrigate for six hours after treatment application. Plant type and even cultivars can affect the optimal rate.

ProGibb T&O. Look for label changes in ProGibb T&O (gibberellic acid) from Valent. The new label permits the use of ProGibb T&O to promote plant growth and overcome over-application of gibberellin-inhibiting plant growth regulators.

Label application rates range from 1-25 ppm, but be cautious. Conduct your own trials on a small number of plants initially using 1 ppm ProGibb unless previous experience warrants higher use rates. Following assessment of plant response, and if desired results are not evident, reaplication or an increase in rate may be warranted.

Configure. Enhancing the lateral branching of floriculture crops just got easier with the labeling of Con-

Updated PGR rate calculator available online

The Plant Growth Regulator Rate Calculator has been updated by Brian Krug of University of New Hampshire and Brian Whipker of North Carolina State University. It is available online (www.floricultureinfo.com). It is an Excel-based calculator that allows the user to easily determine the amount of chemical required for growth regulator applications.
use on woody ornamental plants and non-bearing aged fruit trees. Tiberon inhibits auxin activity, particularly in the meristematic tissue, thereby suppressing apical dominance and increasing branching.

Label rates for spraying woody ornamental plants are 50-200 ppm Tiberon. Although the initial label does not include herbaceous material, we have found effective branching of *Echinacea purpurea*, *Phlox paniculata* figure (6-benzyladenine, 6-BA) by Fine Americas Inc. in late 2007. Benzyladenine is a synthetic cytokinin, which is a natural plant hormone that stimulates cell division and therefore lateral branching.

Configure at a rate of 100 ppm can be applied to Christmas cactus (*Schlumbergera bridgesii*) to promote vegetative branching if applied early (May to June) and to increase flower bud count when applied one week after the start of short days (late September to early October). Configure at 200-300 ppm also increases the number of lateral “chicks” in *Sempervivum* and the number of offshoots in *Echeveria setosa*. Although 6-BA is known to enhance basal branching of *Hosta*, we have also found that Configure enhances the basal branching of several *Echinacea purpurea* cultivars like ‘Doubledecker’ and ‘White Swan’ that are slow to fill the pot.

New growth regulators and more application methods are giving growers more options for controlling plant growth and flowering.

Typically, a 300 ppm foliar spray of Configure doubles the number of basal branches per pot within two to four weeks after application. With increased branching, Configure provides moderate height control as well.

**Tiberon.** Another branching compound, Tiberon 2.8% SC (cyclanilide) from OHP Inc., has been approved for use on woody ornamental plants and non-bearing aged fruit trees. Tiberon inhibits auxin activity, particularly in the meristematic tissue, thereby suppressing apical dominance and increasing branching.

Label rates for spraying woody ornamental plants are 50-200 ppm Tiberon. Although the initial label does not include herbaceous material, we have found effective branching of *Echinacea purpurea*, *Phlox paniculata* and *Coreopsis rosea* ‘Sweet Dreams’ with low rates (20 ppm of Tiberon) that resulted in varying degrees of phytotoxicity. The number of basal branches of *Echinacea purpurea* ‘Ruby Star’ (Rubinstern) was doubled with a fall application of 20 ppm Tiberon. Fall applications of Tiberon appear to be more effective on herbaceous perennials than spring applications. Fall applications will also reduce phytotoxicity issues. Tiberon was approved by EPA in October 2007 and should be available in mid-2008.

**B-Nine, Paczol and Cycocel.** The gibberellin inhibitors B-Nine and Paczol are now marketed by OHP Inc. along with its flagship plant growth regulator Cycocel. The updated label for Cycocel (chlormequat chloride) was approved by EPA.
Let’s face it. Livegoods retailing is serious business, especially in seasonal markets. That’s why it’s time to make the most of your space with the tiered presentation of Benchmaster® recycled-plastic display fixtures. They won’t rust, rot or corrode and last for years! Since Benchmaster® displays are easy to put together without tools, they’re also easy to choose!

Our FREE layout and design service will help you pick displays to fit your space. Create an environmentally responsible, professional garden center that will, to put it simply, move more merchandise. Our personal service is top-notch, because fixtures are all we do!

Three-Step Display with Plant Hanger Plus™

Pyramid with endcap and Plant Hanger Plus™

Round focal point

Benchmaster® recycled-plastic display fixtures:
It’s time to get serious about livegoods retailing

800-523-6899 www.structuralplastics.com

Patent No. 5,579,702 & 5,683,004 © 2008

Chlormequat E-Pro. A generic chlormequat chloride product, Chlormequat E-Pro, was labeled by Etigra LLC, which purchased the data set for U.S. EPA registration from BASF. It is sold in gallon containers through distributors.

Concise. A generic uniconazole, Concise was marketed by Fine Americas Inc. in 2007 with a detailed label for bedding plant foliar sprays and pre-plant substrate sprays as well as additional application information for bulbs, Easter lilies, geraniums, chrysanthemums, poinsettias, azaleas and woody plants.

Application updates

Researchers at Virginia Tech and North Carolina State University have done extensive studies on additional application methods of plant growth retardants to improve efficacy or the economics of their use.

Liner dips, drenches. One method that has been particularly successful on vigorous growing crops is a liner dip or drench. This involves dipping or drenching plugs in a growth retardant solution prior to planting into the final container. Plugs should be dry — ready for irrigation, but not wilted. The root balls of the plugs may be dipped in a vat of growth retardant solution or drenched with that solution in a manner that assures that all cells are fully wetted.

The time that the plugs remain in the solution is not critical (30 seconds to 2 minutes is adequate). Growers should develop their own protocol.

Older cuttings tend to be less responsive than younger cuttings so higher rates may be needed for older, rootbound cuttings. Be aware that there is no loss of effectiveness of dip solution so use it all up or apply it as a drench to other crops.

Treated plugs may be planted immediately or held for several days without affecting the growth response. This allows more management of worker exposure (REI limits) and transplanting operations.

Only Piccolo (paclobutrazol) from Fine Americas Inc. has specific labeling for this application method.

Drench considerations. Drenches are another application method that has been trialed with additional crops. Drenches typically provide...
more uniform growth control than spray applications. They can be applied later in the season, especially at low doses, with limited or no effect on flowering.

Drenches typically take more time to apply than sprays, unless they can be distributed in dripper lines with a product labeled for chemigation (typically paclobutrazol or ancymidol products). The potential extra labor costs must be considered with drench applications.

Keep in mind that a drench dose is based on measuring a specific amount of chemical, adding it to a given volume of water and applying a specific volume of the growth regulator solution to each container. The drench volume increases with container size. See more specific application guidelines on the growth regulator labels, but typically drench a sufficient volume to attain 10 percent leachate when the solution is applied to a moist growing medium.

**Bulb soaks.** Pre-plant bulb soaks are a cost-effective method of treating bulbs. Typically, the growth retardant solution is mixed in a bucket, the bulbs are allowed to soak for two to five minutes, drained and then planted. Based on research with hyacinths, bulbs can be treated up to a week before potting.

Topflor (flurprimidol) from SePRO Corp. is very effective as a pre-plant bulb soak. Its activity is similar to that of uniconazole and it is economically effective on a wider range of crops than the paclobutrazols.

Joyce Latimer is professor and extension specialist for greenhouse crops, Virginia Tech, Department of Horticulture, (540) 231-7906; jlatime@vt.edu. Brian Whipker is professor and floriculture extension specialist, North Carolina State University, Department of Horticultural Science, (919) 515-5374; brian_whipker@ncsu.edu.