Wilted Plants a Hazard at Retail Level

Hydretain a possible solution to this problem

by Jim Barrett and Terril A. Nell

The most serious problem in marketing bedding plants is often their poor appearance in retail display areas. Too frequently, the plants are not watered enough and begin to show signs of severe drought stress, including wilt, yellowing, and early senescence of flowers. These poor quality plants discourage prospective customers, reduce sales and may have to be taken back by the grower.

We have initiated a research project at the University of Florida to evaluate postproduction performance of bedding plants and to find methods to improve the longevity of plants in retail display. As a part of this project, we have been evaluating various water management products, including hydrogels, wetting agents, antitranspirants, and recently, Hydretain.

Forms Gel on Media and Roots

Hydretain is a new product developed by Ecologel U.S.A. and is marketed by Aquatrols Corp. of America, Pennsauken, N.J. It is a liquid containing a group of organic, biodegradable compounds that are hygroscopic, meaning they draw and hold water. Hydretain is unique in that, being a liquid, it can be applied to the media anytime after planting or at the end of production by injection in the irrigation system. When applied, it forms a thin gel on media particles and roots. It remains water soluble and can be leached out of the pot with subsequent irrigation if large amounts of water are applied.

Our Hydretain studies have focused on its potential use at the end of bedding plant production to reduce wilting during the retail display period. Bedding plant plugs were planted in four-inch pots and grown with minimum growth regulator use. At finish, the plants were drenched with three ounces of Hydretain solution. The dilution ratios used were between 1:20 and 1:5. Then the plants were moved to a shaded area in the greenhouse, and the time to first wilt was observed. When each plant wilted, it was watered with 180 milliliters (six ounces) of water, and the time to second wilt was determined.

Delays Wilting of Plants

The seedling geranium 'Red Elite' was one of the first crops tested. As shown in Figure 1, the plants given only water wilted after five days, while those treated at the same time with Hydretain did not wilt until after nine to 11 days. There was little difference between the Hydretain dilutions. The results with 'Little Bright Eyes' vinca are shown in Figure 2. The control plants wilted in four days, compared to plants in the 1:10 dilution treatment that wilted after eight days. Figure 3 shows results of treatments on tomatoes. Control plants wilted in six and one-half days, but the plants in the 1:15 and 1:10 Hydretain treatments went six to seven days longer before wilting.

The difference between the control and treated 'Super Elfin Red' impatiens in Table 1 was not as great as in the other crops. Time to first wilt was three and four days for control and 1:15 dilution, respectively. Of the 180 milliliters of water applied at wilt, the control plants absorbed only 148 milliliters, while the 1:15 plants absorbed 172 milliliters. Time to second wilt for those two treatments was five and eight days, respectively.

Moisture in Media Makes Difference

We found that the moisture level of the media at time of Hydretain application was important for optimum effect, as illustrated in Table 2 with impatiens. The plants were given Hydretain at 1:15 dilution and were either wet or dry before treatment. The moist plants went two days longer than controls before wilt, but the dry plants at treatment did not have any increased longevity.

Precautions to Take

There are some precautions in using Hydretain. The highest concentration (1:5 dilution) was too strong for most crops. In crops like marigolds and tomatoes, it caused phytotoxicity symptoms that appeared as either yellowing of leaves or burning of leaf margins. This treatment also caused a temporary, slight wilting that was easily alleviated by light watering. Wilting occurred most often under conditions of warm sunny days, and there were differences between crops. Vinca was less sensitive; impatiens were

Table 1. Hydretain treatments on 'Super Elfin Red' impatiens in 4-inch pots

Hydretain dilution[1]	Days to first wilt[2]	Water absorbed (ml)[3]	Total days to second wilt[4]
Control	3	148	5
1:20	3	132	5
1:15	4	172	8
1:10	4	167	7
1:5	5	121	7

[1] Each plant received 90 ml (3 fluid ounces) of Hydretain solution. Control plants were given plain water.
[2] Days from treatment to wilt.
[3] At first wilt, plant were given 180 ml (6 fluid ounces) of water. This was amount retained in media.
[4] Total days from treatment to second wilt.

Table 2. Infuence on soil moisture when Hydretain is applied to Impatiens.

Hydretain	Soil Moisture	Days to First wilt	Days to Second wilt
1:15	Wet	7	13
1:15	Dry	5	11
Control	Wet	5	10

more susceptible and would sometimes have slight wilting with the 1:10 dilution. Plants that experienced this temporary wilt and were watered exhibited increased longevity before wilting again.

A potentially more important problem is that Hydretain can be phytotoxic when applied directly to flowers. We have tested it on vinca, impatiens, chrysanthemum, azalea, and marigold. Impatiens and marigold are the most sensitive, vinca is intermediate and the least damage occurred on chrysanthemums and azaleas. We found that injury could be prevented with a light overhead watering to wash Hydretain off the flowers. If possible, Hydretain should be applied directly to the media and not over the top, but if applied over plants in flower, it should be followed by clear water.

The recommended Hydretain dilution on the label is 1:15, which was chosen to avoid any potential problems that may occur on a few crops at the 1:10 dilution. The injection of Hydretain should be done with accurate equipment to avoid potential problems with variations in dilution that result in under- or over treatment. Syphon-type injectors attached to hose bibs are too variable for safe use of Hydretain. Since there are few mechanical injectors that will do a 1:15 or 1:10 injection, Aquatrols has worked with Dosatron International of Clearwater to introduce such an injector for use with Hydretain.

Tested on 10 Major Crops

Our work on bedding plants has included 10 of the most important crops, and results have been similar to the findings reported here. We have evaluated the landscape performance of vinca and impatiens treated at the end of production and found that Hydretain did not interfere with normal growth in well watered beds. Our current research on vinca and impatiens plugs in plug trays is finding similar results on finished plants. Future work will evaluate Hydretain on foliage plants, vegetable transplants, and flowering potted crops, such as poinsettias and hibiscus. We have been pleased with the potential that has been demonstrated by Hydretain in our research trials and are anxious to see how well it fits into the growing practices of commercial operations. ■

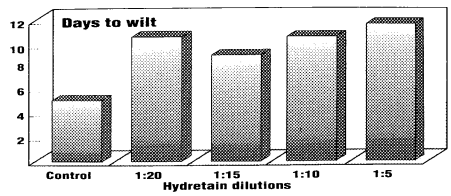

Figure 1. Hydretain treatments on 'Red Elite' seedling geraniums delayed the first wilt. Hydretain was applied directly to the media in three ounces of diluted solution. The control plants were given three ounces of water.

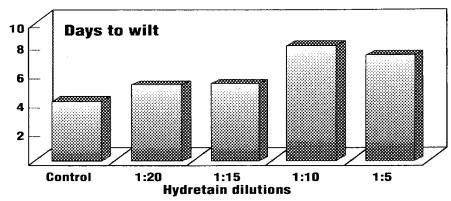

Figure 2. Number of days to first wilt was increased on 'Little Bright Eyes' vinca in four-inch pots. Procedures were same as described in the text and Figure 1.

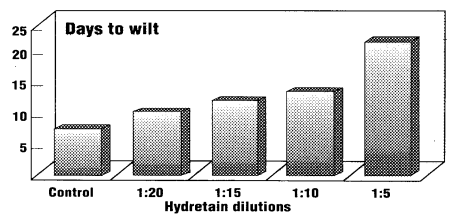

Figure 3. Hydretain delayed wilting of Sunny tomato in four-inch pots. Plants in the 1:5 dilution were showing leaf yellowing by the time they wilted.

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