

Hydrogen Peroxide in Propagation®

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The propagation area at Spring Meadow Nursery is approximately 2 acres of heated concrete floors. We propagate in a gutter-connected range and a new open-roofed Westbrook range. We direct stick our cuttings into production flats or plug flats, which are moved into the propagating houses and placed directly on the heated concrete floors. An environment such as this allows us to easily sanitize propagation areas between crops. However, it also facilitates the growth of algae not only on the floors and walls, but also on the plant material.

Due to the growth of algae on the floors and the top of the soil on our container plants and plugs we saw an increase in fungus-gnat populations, as well as the inability of water to sufficiently penetrate the algae layer during irrigation. We began to research a cost effective and efficient method for dealing with this problem. The most well known product on the market was Zeritol, but with a cost of \$1050 per 30-gal drum plus delivery, it did not meet our criteria of cost effectiveness.

Nevertheless, an alternative was found for such a costly product by considering its core ingredient —hydrogen peroxide. We found that a 15-gal drum of hydrogen peroxide (30% solution) would cost \$35 with no delivery charge. However, the difference between the two products is that the chemistry of hydrogen peroxide is far less stable. Thus resulting in various start-up expenses such as an acid injector pump head for our HE Anderson system. The diaphragm of this pump head is coated with the material Viton, which will not corrode with continuous exposure to hydrogen peroxide. Additionally, new filters for all booms were needed to collect the iron that precipitated out of the irrigation water. Even after the introductory cost, implementing such a program was well worth the expense. We saw a decrease in both the amount of time spent sanitizing, as well as, plant loss due to fungus gnats, fungal and bacterial diseases, and root desiccation.

We apply hydrogen peroxide at rate of 1 : 5000 (200 ppm) though other literature recommends 30–50 ppm for nursery stock. The formula for calculating ppm is:

$$\frac{\text{ppm required} \times \text{total amount of water in Liters}}{\text{grade of hydrogen peroxide} \times 10}$$

If you are use a water storage tank it is suggested you apply 100 ppm of hydrogen peroxide inside the tank. You can apply fertilizer with hydrogen peroxide as long as your H₂O₂ pump head is placed before your fertilizer head so that any pH changes can be adjusted.

There are problems that can occur and it is recommended that irrigation water be tested once per week to determine whether the product is being injected and if it has been calibrated at the correct rate. Since hydrogen peroxide is not buffered, the check valves inside the injection system could become plugged. To reduce the probability of this the original stainless steel balls within the injection point fitting were switched to noncorrosive ceramic balls. Biosafe Systems, the manufacturer of Zeritol offers test strips through various distributors. Their test strips will work with hydrogen peroxide as well as Zeritol. Testing strips are readily available and recommended (to order call:1-888-273-3088).