

TERRAZOLE 35WP – STILL WORKING AFTER ALL THESE YEARS

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I started working on Terrazole in the 1980's when I was a Professor of Plant Pathology at the University of Florida Central Florida Research and Education Center. I worked primarily on foliage plant diseases at that time and found good to excellent control of *Pythium* root rot on pothos, schefflera and begonias. In 1994, I returned to California and found to my surprise that Terrazole was not registered for use. After more than 30 years of use, there are no documented cases of resistance to etridiazole. It has recently been registered in California to aide in control of *Pythium*, *Pytophthora* and downy mildew populations that are resistant to mefenoxam (the active ingredient in Subdue MAXX).

Terrazole CA was registered for use in California a couple of years ago with the express purpose of combating mefenoxam resistance. This has been a great boon for the California growers but differences in the legal uses are significant. The most critical difference is that the product cannot be used outside a greenhouse and cannot be used on pot sizes greater than 6 inches. A PCA (pest control advisor) must write a prescription stating that Subdue MAXX resistance is present at the greenhouse. Further limitations on the re-treatment are the use rates are 4-6 oz/100 gal. instead of the national label that includes 3.5 to 10 oz/100 gal. Finally, Terrazole CA can only be used twice on a 30-day interval on a crop unlike the Terrazole label that states reuse is legal on a 4- to -12 week interval.

Figure 1. Chase Research Gardens, Inc. trials 1997 to present.

Plant	Rate/100 gal	Interval	Rating	Result
Calla lily	6 oz	28 days	% roots	No control
Calla lily	3.5, 6 oz	14 days	Root weight	Excellent control
Geranium	6 oz	14 days	% roots	Very good control
Geranium	3.4, 5.1 oz	28 days	% roots	Poor control
Geranium	6 oz	14 days	Top grade	Excellent control
Geranium	2.5, 5, 10 oz	30 days	% roots	Very good control
Lily	3.5, 6 oz	28 days	Root grade	Some control
Lisianthus	5 oz	21 days	Root grade	No control
Lisianthus	6 oz	Once	Top grade	Very good control
Lisianthus	5 oz	28 days	Wilt	Very good control
Pansy	6 oz	Once	% roots	Very good control
Pansy	6 oz	28 days	% roots	No control
Snapdragon	6 oz	Once	Disease severity	Very good control
Snapdragon	3.5, 6 oz	28 days	Height	Poor control

Over the past eight years we have run a number of tests for control of *Pythium* and *Phytophthora* with Terrazole. (Most of the trials were conducted prior to the registration of Terrazole CA, so they did not take into consideration the labeling restrictions of the compound in that state.) The results are

summarized in the table above. *Pythium* root rot can present a variety of symptoms from stunting to wilt to root loss. We rate the disease severity accordingly and sometimes evaluate fresh weight of tops and/or roots as well as height, top grade (quality), the percentage of healthy appearing roots and the degree of wilting. For instance, on geranium we usually record the percentage of healthy roots but sometimes rate top grade instead.

Our most recent trial was performed using field grown Call lily bulbs that were infected with *Pythium* sp. at the time of planting. We drenched them three times on a 21-day interval with Banrot (8 oz/100 gal.-combination of etridiazole and thiophanate methyl), Terrazole (3.5 or 6 oz/100 gal.) and Terraneb (12oz/100 gal.-chloroneb). The graph (Figure 2 below) clearly shows that root growth was much higher when the infected calla bulbs were drenched with Terrazole (3.5 or 6 oz) than with Banrot (8oz) and the same as Terraneb in this trial.

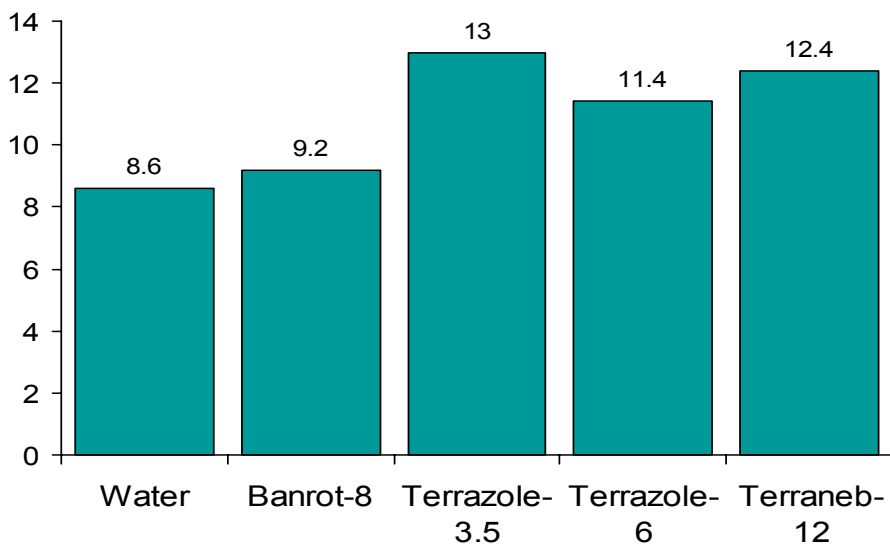


Figure 2. Efficacy of Terrazole in controlling *Pythium* root rot on Calla lilies. The numbers listed after each fungicide are the oz/100 gal rate. The bars show the mean fresh weight of roots.

We also perform trials occasionally on *Phytophthora* diseases although Terrazole should be used as a drench and our trials mainly test aerial *Phytophthora* disease. We did a trial a couple of years ago on *Phytophthora* root rot on *Spathiphyllum*. This disease sometimes appears as an aerial blight but is usually confined to root loss and stem death in California. In this case, we applied the products as soil drenches five times on a 14-day interval. The table below lists the fungicides and rates per 100 gallons.

Aliette	16 oz/100 gal
Subdue MAXX	1 oz/100 gal.
Terrazole	6 oz/100 gal
Banrot	12 oz/100 gal.
Stature DM	6.4 oz/100 gal.-dimethomorph

All the products worked very well in preventing the root loss. Although root loss in the trial was minor the fungicides did supply a significant degree of rot control.

Over the eight years that we have conducted trails, Terrazole has typically performed very well. The few exceptions are shown in Figure 1 and nearly always occurred when the treatment interval was 28 days or longer and/or the use rate was at the lower end of the label (3.5 to 5 oz/100 gal). A 28-day interval is too long in some cases so you should consider alternating with another chemical class like mefenoxam, fosetyl aluminum or azoxystrobin under higher disease pressure. Although the label clearly allows for use of lower rates, in an experimental setting we found that shorter intervals were better than longer intervals. The 3.5 oz rate is viable under many conditions and most of our trials have been limited to 6 oz to reflect the limitations on the Terrazole CA label. It is especially important to use Terrazole 35WP when fungicide resistance is a concern. For these reasons, I suggest rotations between chemical classes to maintain the maximum efficacy of any drench fungicide you choose to use.