

Easter Lilly Bulb Production

On the foggy coastal marine terraces of Del Norte County, California, and Curry County, Oregon, a fascinating, challenging industry exists that supplies the entire United States with beautiful Easter lilies. Bulbs, the final product of these farmers' hard work are sent to greenhouse ranges around the world to force a potted Easter lily which is sold to customers.

About 600 acres of fertile coastal land in the two counties is planted each year. This is a \$6.5 million to \$7 million industry employing hundreds of people, and obviously an important asset to these rural communities hard-strapped by declining forest revenues. More than 65,000 boxes of bulbs are shipped worldwide by the 10 companies who make up the Pacific Bulb Growers Association.

Lily bulb propagation is a cloning process. Named varieties such as Nellie White, Ace and Snowwhite are the product of years of selection. (The breeding of lilies is another whole story in itself!)

The cycle begins with planting in fall. Both small-stem bulblets and scales are planted. Scales are the specialized leaves designed for food storage that are attached to the basal plate which together make up a bulb. When separated and planted a small bulb will grow at its base.

Stem bulblets grow on the underground portion of the stem and can be planted to grow into larger bulb. It takes two to three years for a salable bulb to be produced. Each year after planting, everything is dug up and sorted, the commercials are packed and sold, and everything else is replanted for another year of growth. When a salable bulb is ready, it is packed and shipped to greenhouse growers around the nation who force the bulbs to produce flowers for Easter time. The natural cycle of the plant is to bloom in July.

MAJOR PRODUCTION CHALLENGES

Putting small pieces of fleshy bulbs into the soil in late summer and hoping you have something a year later after 80 inches of rain, soil and airborne fungi, bacteria, nematodes, freezes, gophers, etc. is truly an act of faith and a highly refined agricultural production methodology. It is easy to understand why the Pacific Bulb Growers Association own their own research station and hire a full time researcher, Lee Riddle, to run it.

The A.N. Roberts Easter Lily Research Station is located in Harbor, Oregon. This industry has an interesting history, and many scientific articles have been written about Easter lilies as researchers from Oregon State University, University of California, Washington State, University of Minnesota and many other institutions have conducted experiments to try to help solve the numerous production challenges. Nematodes, basal rot and botrytis, are still the biggest concerns. Aphids attack the plants throughout the spring and summer.

NEMATODES: THE BIGGEST CHALLENGE TODAY

Protecting the young bulbs from *Pratylenchus penetrans*, the lesion nematode, is far from easy. This nematode has a very wide host range and there are no commercial crops that are not a host to rotate to in this area. Pasture for dairy and beef cattle is the main rotational use of the land.

The number of nematicides available has shrunk to just a few: Telone, Rampart, NemaCur, Basamid, Metham Sodium and Methyl Bromide. For California growers the list is shorter as NemaCur and Telone are not registered. Soil fumigation continues to be an important tool for preplant crop protection, but an in-furrow application of a granular nematicide is also necessary to protect this crop, which is in the ground for a year at a time.

There is a complex interaction between the damage the nematodes do to the roots and the invasion of fusarium and other fungal basal plate rosters. Fungicides are used as preplant dips to protect the bulbs. Cultural practices, such as clipping the roots off and many other techniques, are constantly being evaluated for economic practicality and disease control success.

Protecting the crop from nematodes and fungus are the primary emphasis of researchers today. Lee Riddle sets up many test plots at the experiment station trialing pesticides and cultural practices and reporting to the growers meeting monthly. Dr. Becky Westerdahl, UC Cooperative Extension specialist, has been the project leader on many trials conducted at the station in Curry County and in Humboldt County on nematode control.

With my help and that of Cindy Anderson (student research assistant at UC Davis), Lee Riddle and several graduate students, several tests were performed on numerous nematicides, application techniques and hot water dips in an effort to control these diseases.

I wish we could report one simple answer to these production challenges but, as nematodes are a very challenging pest, an integrated approach using all the tools available and constantly looking for new techniques will be needed to keep the Easter Lily Bulb Industry healthy and thriving.