

Rots Currently Affecting Lily Forcing*

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Over the years, 12 distinct rots of lily bulbs have affected plantings of various kinds of lilies in the Pacific Northwest. Fortunately, the universal lily disease, basal rot, has never been serious in the Easter lily plantings. Other bulb rots have varied from year to year. Formerly, Croft lily bulbs were disfigured regularly by the ugly scale tip rot, and occasionally they were seriously diseased with the Creole lily malady—black scale. Apparently, the standard Terraclor-Ferbam dip has prevented notable occurrence of black scale during recent years. Conversely, the standard dip has allowed the development since 1964 of two other rots, namely, root base rot and a specific *Penicillium* rot. This note is presented to define these two diseases for florists and bulb growers.

Root base rot

Root base rot results when fungi grow from the decaying roots at the base of the bulb through the vascular root traces in to the tissues of the basal plate (Figure 1). The decay of the roots frequently is associated with the feeding of the root-lesion nematodes and invasion of tissues by several fungi, but subsequent decay in the basal plate usually is associated with the activities of the fungus *Cylindrocarpon*. When dug, affected bulbs have notably poor roots and initial dark vascular traces extending into the basal plate. During shipment and early stages of forcing, the tissues of the basal plate are rotted and growth of the daughter bulb is stopped. Thus, forcers can detect the disease by failure of the plants to emerge. Examina-

tion of the bulb in such cases often reveals a hole extending through the base of the bulb.

Experiments to control root base rot by chemical treatments have failed spectacularly during the past three seasons. The reason for failure is that all tested mercurial fungicides known to be effective against a *Cylindrocarpon-Fusarium* complex have proved devastatingly phytotoxic to Ace lilies. Deep planting of scales was developed by Tod Westbrook of Smith River, California; observation of this type of planting indicates that propagation from scales can be an immediate approach to control. Starting with scales selected from healthy bulbs and planting them in treated soil avoids the initial infections present on bulblets. This seems to be the best explanation of why growing from scales is proving better than growing from bulblets when propagating the Ace lily. General trial of scale propagation is recommended while we continue to screen fungicides to find one usable for Easter lilies.

Penicillium bulb rot

Penicillium rots of scales of various lilies have been recorded in the Pacific Northwest since 1931, but none have been alarmingly serious until the current outbreaks on Ace lilies. This blue mold disease must not be confused with the similar rots of iris and tulip bulbs where several species of *Penicillium* are concerned. The rot of Ace bulbs is due to a specific *Penicillium* fungus that causes

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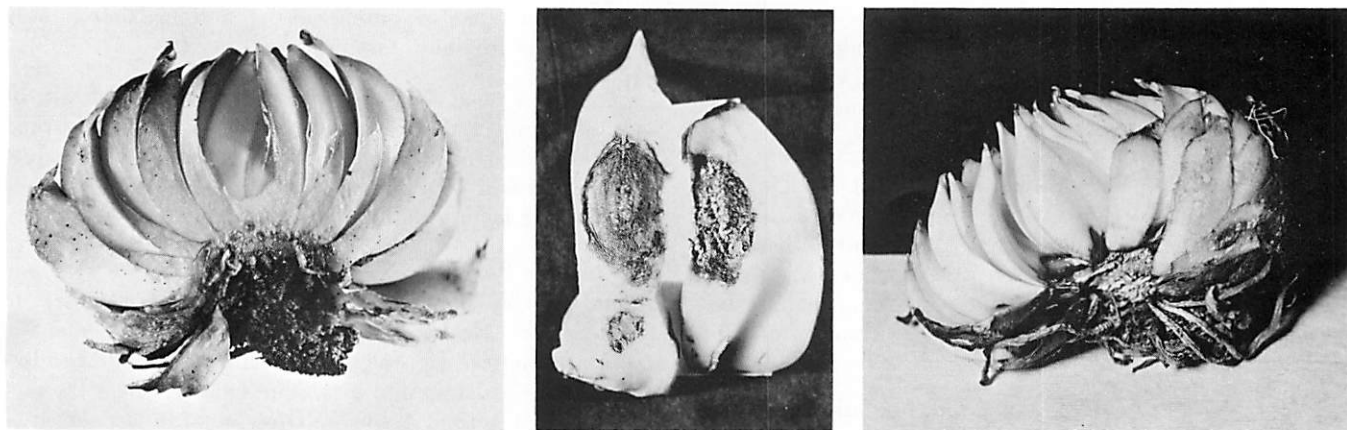


FIGURE 1. Two types of rot are shown in these photos. At left is root base rot. Note that rot is confined to the basal plate and that most of the plate is destroyed. At center is *Penicillium* rot of outer scales. Note the typical rough brown lesions on bulbs when they are removed from storage. The white marks on the lesions are the fruiting bodies that characterize this pathogenic blue mold. At right is *Penicillium* rot of inner scales. Note black rot at the points where scales of the daughter bulb are attached. Such bulbs cannot be forced because short forcing tissues are destroyed.

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large grayish-brown lesions on the outer scales of the bulb and black lesions on the bases of the inner scales, often near the point where the old stem was attached (Figure 1). The daughter bulb may rot off; then no shoot can be formed. The natural decay of the old flower stalk if left cut and not pulled, and the injury to the tissues at the base of the stalk if pulled, both seem to be associated with the development of this disease.

It is very probable that decay at the base of the daughter bulb may be associated with inadequate curing of the tissues following coincidental pulling of the stems and digging of the bulbs. Dr. Roberts and I suggest that removal of the stems a few days before digging the bulbs be tested as a means to insure callusing before the bulbs are dug and literally inoculated with *Penicillium* in the soil during digging. Certainly, experimental testing of callusing methods will be a principal subject for research at the Harbor plot this season.

Dr. Gould at the Agricultural Experimental Station at Puyallup, Washington, has devised chemical treatments that reduce blue mold rots of iris and tulips. Perhaps some of these treatments can be adapted for lilies at the time the bulbs are packed.

Do not confuse

These two rots, currently important during storage and forcing, should not be mistaken for the odoriferous wet rotting of bulbs in cases. When cases are opened and the pack appears as a smelly, slimy mass, the rotting is largely due to *Rhizopus*, the air-borne bread mold fungus. *Rhizopus* infection results from warming of the bulbs in the cases before or during transit. This general rot, which often destroys all the bulbs in a case, has no apparent connection whatever with the field history of the bulbs.