



The University of Arizona,
College of Agriculture, and
U. S. Department of Agriculture cooperating

BACTERIAL NECROSIS OF THE GIANT CACTUS

Bacterial necrosis is prevalent throughout the natural Saguaro population. While uncommonly seen in ~~small~~ plants, these are also susceptible.

Cause - The disease is caused by a bacterium (*Erwinia carnegleana*). The same bacillus also causes a rotting of cholla, prickly-pear, barrel and organ-pipe cacti and, under proper conditions, a rot of such diverse fruits and vegetables as Persian melons, tomatoes and Italian squash.

The bacterium is primarily carried from saguaro to saguaro by a night-flying moth. The larvae of this moth are commonly found feeding in the base of saguaro flower buds. Later these, or others, tunnel into the plant. It is along these tunnels that infection usually starts.

In addition to the moth, however, it seems probable that under some conditions saguaros may also become infected through the introduction of contaminated soil into fresh wounds, through prolonged contact with another diseased saguaro that has fallen on it, and through root contact with diseased roots from another saguaro.

The saguaro has the capability of "walling-off" an injured or diseased area with callus tissue. The "boots" commonly associated with woodpecker holes in the saguaro are examples of such tissue formation. There are times when the plant is apparently unable to form this tissue, or to form it fast enough to prevent spread from the larval tunnels or other wounded areas.

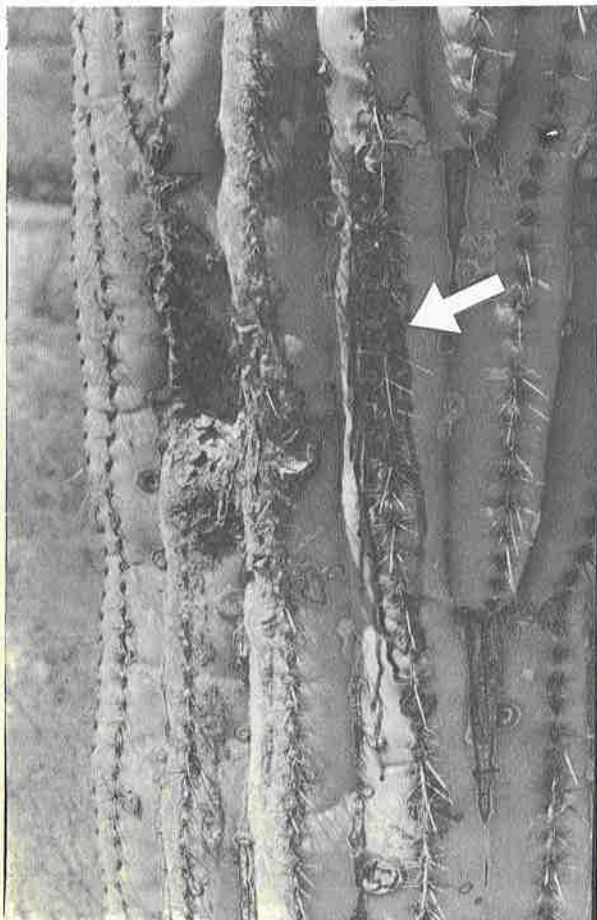


Fig. 1. Bacterial necrosis may begin as the result of an injury followed by bleeding.

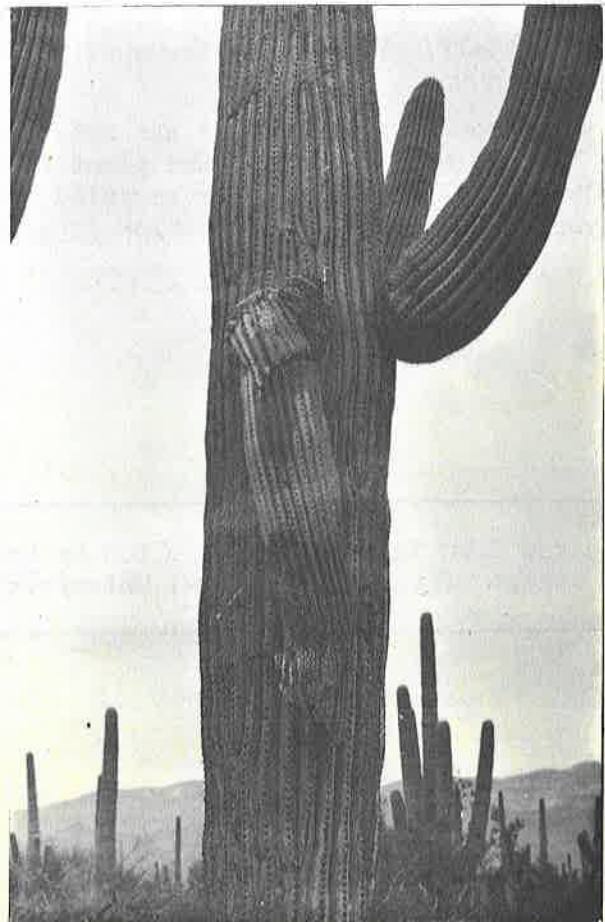


Fig. 2. An infection as illustrated in Fig. 1 may spread and result in loss of a branch.

Symptoms - The first external symptom of bacterial necrosis is usually a circular darkening and softening of the plant tissues. In time the infected area may enlarge, become purplish-black and split open. If such an opening occurs, a dark odorous material will frequently "leak" out of the plant. At other times the soft areas dry and crack, revealing, inside, the dark, dry remains of diseased tissues.

The symptoms may appear on the trunk or branches of the saguaro at anytime. However, these are perhaps most frequently noted in the field after late winter - early spring rains, after the summer rainy season starts, or during the mild fall. Unfortunately, the only good way to tell how far the disease has spread within the plant, beneath the external symptoms, is to "dig in."

Control - "Digging in" is the most practical way of controlling the spread of the infection within the plant. If the affected area is small, one should remove all of the rotting material and also healthy tissue about 1/2" beyond the edge of the original rot pocket. Be careful not to make "puncture" type cuts into the remaining healthy tissues. Rather, the walls of the cleaned rot pocket should be smooth. Wash the cleansed pocket with 10% household bleach (1 part of Chlorox or Purex to 9 parts of water). Allow the pocket to stand "open." Be certain to wash the utensils used in cleaning out the rot. The removed decayed material should be soaked in the bleach solution for several hours or incinerated.

If the lesion is so large as to nearly girdle the plant or weaken an arm, serious consideration should be given to removal of the entire plant or arm. A large saguaro (even a large arm) is heavy and serious injury or damage can result if they were to fall on a person or a building.

Though the bacteria which cause the necrosis are killed by a number of antibiotics, the expense of these essentially prohibit their use on a practical scale. Unfortunately, effective methods of preventing the plant from becoming infected are not known.

If the diseased tissues are not treated, there is no way of predicting just how long it will be before the plant is completely infected. However, field studies involving 462 plants revealed that 50% died within 7 years and 75% within 12 years of the first observation of symptoms.

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