

More about Alfalfa Stand Decline

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The disease known as alfalfa bacterial wilt is caused by a soil-inhabiting bacterium, *Corynebacterium insidiosum*, which occurs sporadically in various regions of the State. Wilt is found chiefly along the Colorado River and at higher elevations in Northern Arizona.

Symptoms of bacterial wilt

As the name implies, wilting of infected plants is the most common late symptom of this disease. Earlier symptoms are: stunting, yellowing of the shoots and leaves, and leaves cupping upwards. Root symptoms include the appearance of brown, dot-like spots (when viewed in cross-section) in the wood (See illustration). In longitudinal root sections these areas appear as streaks. The brown-colored areas represent gum-plugged, water-conducting vessels (See illustration). Plugged vessels impair the normal functions of the plant, resulting in wilting, then death.

How is wilt spread?

Irrigation water and implements used in cultural practices are capable of spreading wilt in a planting.

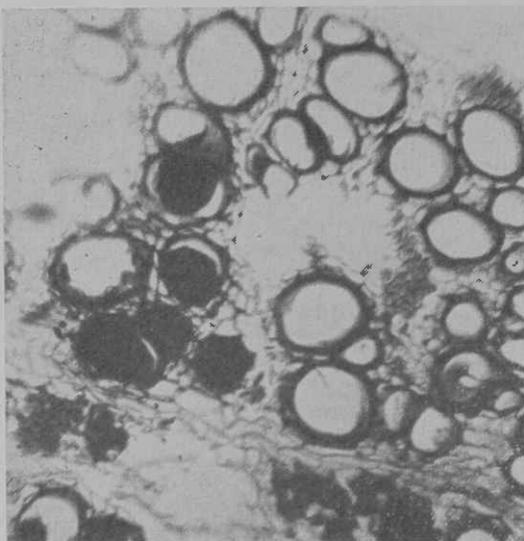
Can wilt be controlled?

Caliverde, Ranger, and Buffalo alfalfas are resistant to bacterial wilt. Buffalo and Ranger are adaptable to higher elevations. In the central and southern counties wilt is not a major problem, and crop rotation with non-susceptible crops is the practical way to control it. Resistant varieties, Ranger and Buffalo, are not very well suited for hay production in these counties.

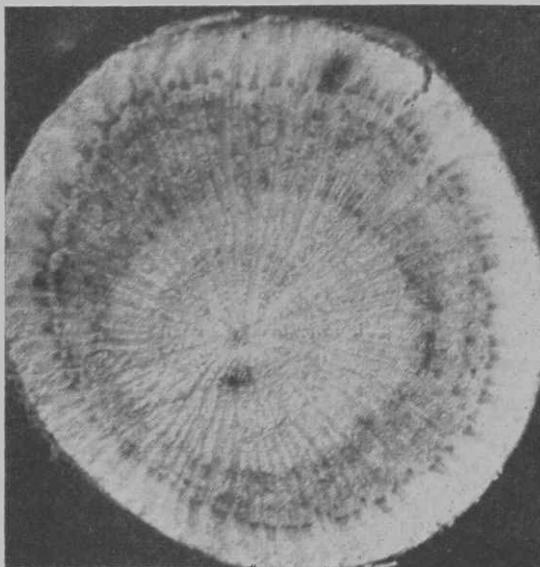
Alfalfa dwarf

Both wilt and dwarf may appear in the same planting. Dwarf is caused by a virus. The virus is the same one causing Pierce's Disease of grapes. Some weeds, including Bermuda Grass and Johnson Grass, carry Dwarf virus without showing external signs of disease.

Alfalfa dwarf has been detected in African and Chilean alfalfas by approach root grafts in experiments at this Station. Plants seemingly infected with wilt in addition to dwarf were used as sources for these experiments. The source plants



Greatly enlarged view of a few gum-plugged water-conducting vessels (dark regions) in root of Chilean 21-5 alfalfa. The clear circular areas are non-infected vessels.



Cross-section of a Chilean 21-5 alfalfa root showing dark, dot-like areas in wood.

were collected from commercial fields in Yuma and Maricopa counties. It is possible that dwarf may be more widespread than any of the alfalfa diseases, with the exception of crown rots, in Arizona.

Symptoms of dwarf

Investigations show that it is impractical in the field to attempt to distinguish dwarf symptoms from those caused by the wilt bacterium, in Central and Southern Arizona. Yellow, stunted plants having roots with plugged water-conducting vessels are characteristic of dwarf. These symptoms are also found in wilt.

How dwarf is spread

Alfalfa dwarf virus is spread by several species of sharpshooter leaf-hoppers. Many of the species known to spread the virus elsewhere exist in Arizona.

How can dwarf be controlled?

None of the alfalfa varieties presently grown in Arizona are known to be resistant to the dwarf virus. California Common 49 is known to be tolerant. By tolerant is meant that the virus may enter the plants but not cause appreciable damage.

Many weed and cereal hosts of the virus make the control of dwarf rather difficult. Since Bermuda Grass is susceptible it should be kept at a minimum wherever grapes and alfalfa are to be grown. The same applies to Johnson Grass. Alfalfa and grapes should not be planted in proximity. Rotation with non-susceptible crops will also help to reduce the amount of virus in weeds surrounding alfalfa and grape plantings.

Insecticides used against the leafhoppers will also aid in reducing the amount of infection.

OTHER DISEASE

Witches'-broom is caused by another leafhopper-transmitted virus. The stems of infected plants are more numerous and longer than normal. The disease has been observed in the Yuma and Coolidge areas.

*A previous article by Dr. Keener on causes of alfalfa stand decline was in PROGRESSIVE AGRICULTURE, October-December, 1955.



Cochise County
Wed., 6:30 a.m.—KAWT

Coconino County
Tues. and Thurs., 8:10 a.m.—KCLS

Graham County
Sat., 10:00 a.m.—KGLU

Greenlee County
Sat., 12:15 p.m.—KCLF

Maricopa County
Sun., 8:45 a.m.—KOY

Yuma County
Mon. through Fri., 7:20 a.m.—
KYUM

ARIZONA FARM & RANCH HOUR
Every Saturday at 12:30 Noon
on Following Stations:

KOY—Phoenix
KYMA—Yuma
KVNC—Winslow
KCLS—Flagstaff
KAWT—Douglas
KSVN—Bisbee
KTUC—Tucson