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Southwestern

COTTON RUST

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Southwestern Cotton Rust

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Southwestern cotton rust has been known in Texas since its discovery at Falfurrias in 1909. It first appeared in Arizona in 1922 and has caused relatively light losses in most years. A severe outbreak occurred in 1959 in Arizona and New Mexico and in recent years losses have been heavy in West Texas.

Rust damage results from defoliation and stalk, stem or petiole breakage at lesions on these parts. Broken stalks are more difficult to cultivate and harvest mechanically. Yield reductions up to 75 percent have been reported in infected cotton. The cover shows the appearance of rust on cotton leaves.

Rust first appears on cotton as small spots, or pustules, on the upper leaf surface. Later, large orange pustules appear on the lower leaf surface and discharge orange spores (aeciospores). These pustules later become inactive and turn dark brown. Several lesions on a leaf may cause it to shed. Aeciospores are wind-blown to wild grama grass in the vicinity, where they germinate, grow and produce red spores, (urediospores). These spores cannot infect cotton but may reinfect grama grass if conditions are favorable.

As the grama grass matures, the rust fungus produces black spores (teliospores). These spores infect neither grama grass nor cotton. Instead, they lie dormant on dead grass until the following spring where they germinate, giving rise to basidiospores on a structure called the basidium. These tiny spores cause the first infections on the upper leaf surface of young cotton plants. This

life cycle is illustrated with the seasons in which the spore stages usually appear, Figure 1.

Two requirements for the rust epidemic in an area are: (1) Grama grass must carry a supply of teliospores into the following spring and (2) these black spores must receive soaking rains and high humidity after the cotton begins to grow.

Relatively light rust infestations on grama may be sufficient to cause heavy cotton rust infections. Normally, a rainfall of ½ inch or more, followed by 12 to 18 hours of high humidity is needed for good rust development.

Annual surveys in range and waste land around cotton fields will determine the presence of teliospores on grama grass. Six-

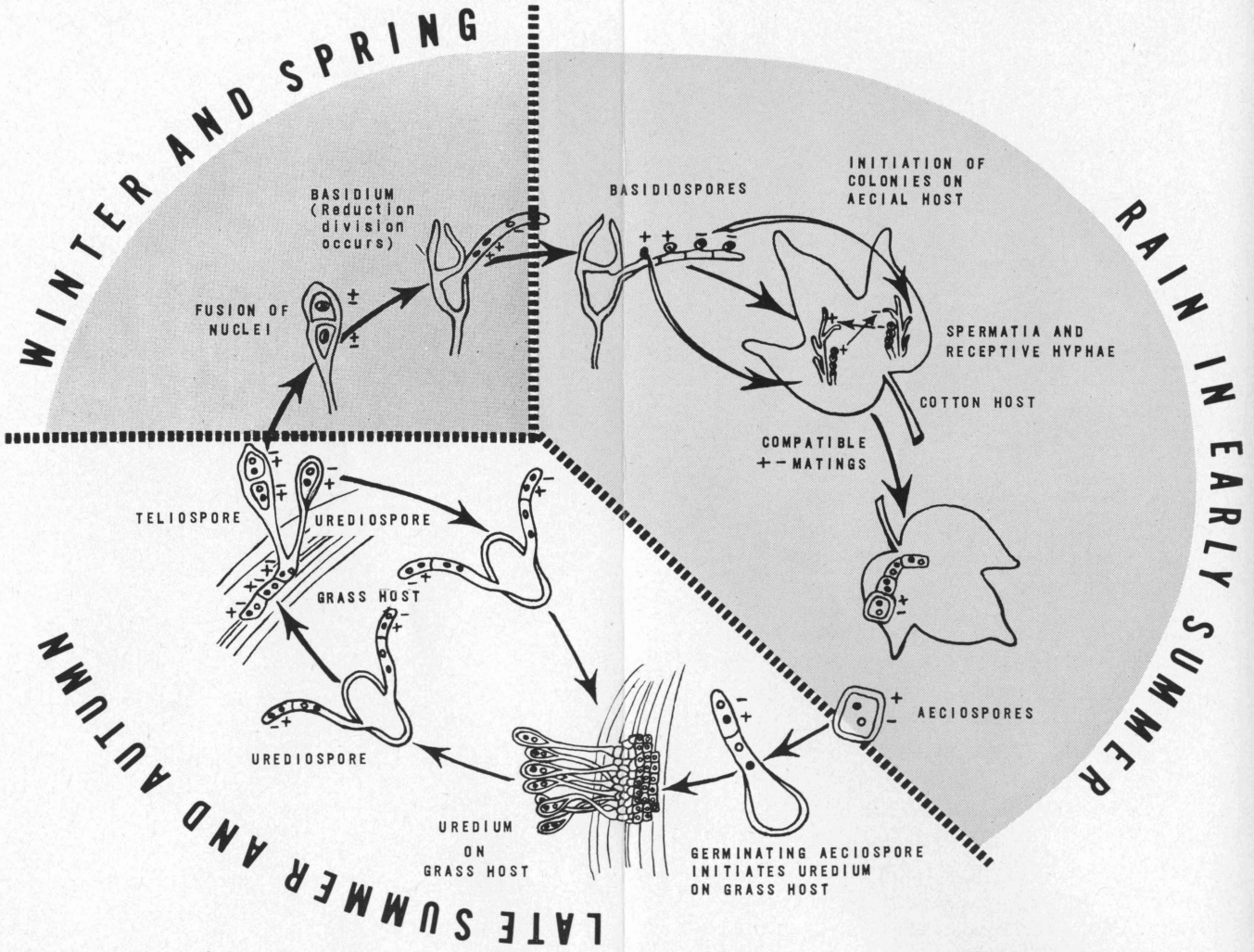

Fig. 1. Life cycle of the cotton rust fungus showing relationship to hosts and approximate season of development of each stage.

Damage occurs on cotton at this time.

Life cycle not important to this year's cotton.

Look for black spores on grama grass during this period for next crop year.

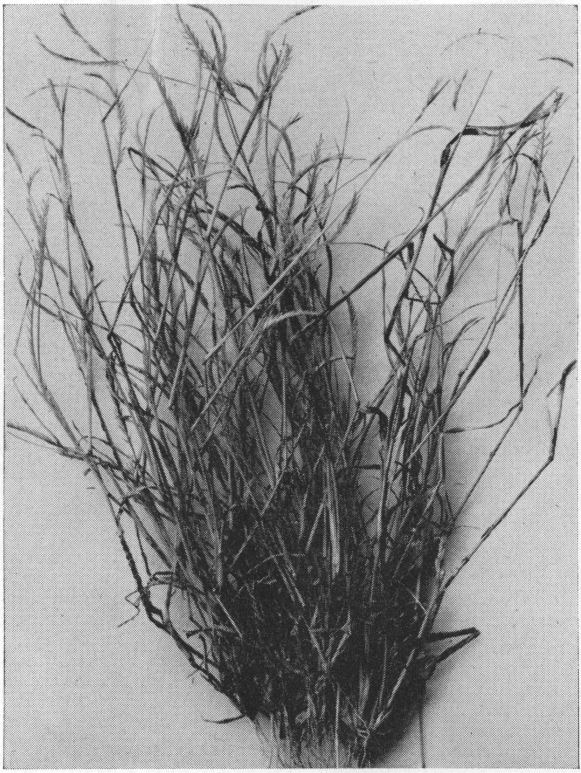

Figure 2. Rust on an overwintering grama grass plant.

weeks grama and needle grama are the most frequent rust hosts, but other grama grasses also may be infected. Figure 2 shows rust on dead grama grass.

The most effective control for Southwestern cotton rust is the application of zineb before the cotton is infected. Apply the first spray before the rains begin in June or July and follow with two additional sprays at 12 to 15 day intervals. Apply 2 pounds of wettable powder plus spreader-sticker in 40 gallons of water per acre. Make applications with ground equipment with 3 to 5 nozzles per row for thorough coverage. For best coverage, place side nozzles at 45 degrees forward in line of travel and angled up or down, depending on location.

No treatment can control the fungus after infection has occurred. Successful

disease control depends on having protective fungicide on the plant before rust spores appear.

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