Damaged boll. Pink bollworm damage to cotton boll is shown in three views above from left. Exterior view shows exit holes of worm; cut in half, the boll reveals a pink bollworm inside; and the extent to which damage can be done is illustrated at right.

In 1889 Dr. T.D.A. Cockerell, Consulting Entomologist, reported in Arizona Agricultural Experiment Station Bulletin 32 that the "Salt River Valley was found to be remarkably free from insect pests. . . . It would be difficult to find another locality so favored and at the same time producing such an abundance of different crops . . . . While the present conditions of affairs . . . is highly satisfactory, the cheerful optimism which assumes that pests cannot live there is hardly justifiable."

After nearly seventy years it at times appears that it would be difficult to find another locality producing such an abundance of crop insect pests as may be found in the Salt River Valley and the other irrigated farming areas of Arizona. A distinguished European insect ecologist has called the irrigated portion of Arizona an "insect incubator," with an unusually favorable environment for insect growth and survival.

Among the numerous kinds of insects attacking Arizona crops the following species and groups include most of the major crop pests. (For this discussion spider mites, which are actually near relatives, are considered as insects.) Included are three "prima donna" species of current and continuing importance and seven pest groups, each containing species of current, fluctuating, or potential importance.

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Three "Prima Donnas"

1. The Pink Bollworm is a cotton pest that has recently become more abundant and destructive than at any time since it was first found in the state nearly 40 years ago. Damage to developing bolls in the major-growing areas has been particularly severe since 1966. The large population recently encountered have not been readily controlled by measures previously considered to be effective. Extensive research directed toward a better understanding of this pest and the development of better control methods is now being conducted by the University of Arizona Agricultural Experiment Station.

2. The Bollworm, alias the corn earworm, alias the tomato fruitworm, is a major pest of long standing, both locally and nationally. In Arizona it attacks cotton bolls, developing ears of corn, tomato fruits, lettuce heads, alfalfa seed pods, grain sorghum, beans, and other crops.

3. Lygus Bugs (mostly a single species, Lygus hesperus) are the major pest of squaring cotton, particularly in July. Damaged squares are usually shed and the full extent of injury may not be recognized until an abnormally small set of bolls becomes evident. Lygus bugs are also major pests of seed crops of alfalfa and sugar beets in Arizona.

Seven Deadly Destroyers of Crops

4. Caterpillars. Although two members of this group are listed above in the prima donna class there are also many others of concern. Most species are defoliators but some are root feeders, borers or web builders. The headliners include the beet armyworm, western yellow-striped armyworm, cutworms, cabbage looper, salt-marsh caterpillar, cotton leaf perforator, hornworms, webworms, omnivorous leafroller, lesser cornstalk borer and southwestern corn borer.

5. Aphids. These pests feed on plant juices. Some species are also involved in the transmission of plant disease organisms. Recent and continuing headliners include the spotted alfalfa aphid, cotton aphid, green peach aphid (vegetables), pea aphid (alfalfa), English grain aphid (barley), corn leaf aphid (corn, sorghum), spiraee aphid (citrus), cabbage aphid, cowpea aphid (cotton, alfalfa), and woolly apple aphids.

6. Spider Mites are near relatives of insects which feed on plant juices. Several species are common pests in Arizona. Crops attacked include cotton, alfalfa, bermuda-grass seed, small grains, vegetables, sugar beets, and citrus. Mites may become abundant following improper use of pesticides.

7. Leafhoppers. These sap feeders may give injured leaves a mottled appearance known as "hopper-burn." Important crop pests in Arizona include grape leafhoppers, the southern garden leafhopper, the western potato leafhopper, and the beet leafhopper, the well-known transmitter of curly top disease of sugar beets and other crops.

8. Beetles comprise the largest group of insects, including a variety of crop pests. Many are of greater importance elsewhere than Arizona. Common pests of local crops include cucumber beetles and flea beetles, darkling beetles (on seedling cotton) the Egyptian alfalfa weevil, billbugs, and the green June beetle. A western form of the boll weevil is a possible threat to cotton.

9. Thrips rasp plant surfaces to feed on internal juices. The citrus thrips attacks foliage and developing fruits and is the major pest of this crop in Arizona. Other species of thrips attack onions, other vegetables, bermudagrass seed, and various other crops. Seedling cotton may be damaged by thrips although plants often recover without control treatments.

10. Scale Insects are potentially serious pests of Arizona citrus and are therefore included among the "big ten." The major reason for the highway inspection of all vehicles entering Arizona is the California red scale, usually considered to be the worst pest of citrus in the United States. It has been intercepted many times but is not yet established in Arizona. Other scales occasionally found on Arizona citrus include the citricola scale and the cottony cushion scale.

From the top are the winged adult of the cotton aphid; an adult two-spotted spider mite; an adult leafhopper (left); a darkling beetle; and at bottom an adult thrips.

Other Crop Pests worthy of mention but not enumerated above include stink bugs and flea hoppers (cotton), the potato psyllid, the 3-cornered alfalfa hopper, the alfalfa seed chalcid, and the sorghum midge. A complete review of important Arizona insect pests would also include a variety of additional species affecting ornamental plantings, turf, households, stored products, forests and ranges, livestock, and man.