

Pecan IPM Toolbox



Pecan Basics

The Pecan Tree



The pecan, *Carya illinoensis*, is a member of the plant family Juglandaceae. This family includes the walnuts and the hickories. Brison, in his book "Pecan Culture," writes that the pecan is the most important horticultural crop native to the United States. The pecan is a large tree, often growing to 100 feet high or more and has a stately appearance. It has been proclaimed the state tree of Texas.

The pecan is indigenous to a large area extending from the Mississippi River Valley on the east to the western branches of the Llano and San Saba rivers of Texas on the west, and from southern Illinois in the north to northern Mexico in the south. Isolated populations also occur in Alabama, far west Texas, and Mexico. These may be important sources of diversity that can be used in pecan breeding. Unlike other horticultural crops, the native pecan is very important commercially.

Pecan Production in the U.S.



Related:

[NASS Quick Stats Map](#) average pecan production (lb) 2001-2005

[Utilized Pecan Production by Varieties: Texas and United States, December 1, 2010](#), National Agricultural Statistics Service (NASS), USDA

The United States is the world's leader in pecan production. While exact numbers for world production are unknown, it is estimated that the U.S. produces 75 percent of the world's pecans(Johnson, 1997). ¹

Pecans are produced on about a million acres worldwide. Annual production usually averages between 200 and 300 million pounds. However, unlike most cultivated crops, the domestication of the pecan only began late in the late 1800's and much genetic potential remains to be capitalized upon. Furthermore, wild pecans in Texas, Oklahoma, Arkansas, Louisiana, and Mexico are perfectly acceptable in the marketplace.

Worldwide pecan (nut) production generally exceeds 250 million pounds per year. The pecan has been introduced to foreign countries such as Israel, South Africa, Brazil, and Australia, as well as states on the Eastern Seaboard. Georgia, which had no pecans a few hundred years ago, has within the last 75 years become the leading pecan producer in the U.S. Texas production averages about 35 million pounds per year.

Source:

¹ [New Mexico's Pecan Industry: Estimated Impacts on the State's Economy](#)

Pecan History and Arthropod Management

Prior to 1800

- Native Americans gathered and subsisted on pecans; early explorers and settlers readily adopted them to their diets.

1800 to 1900

- Settlers thinned tree stands in native range leaving pecans and grass for grazing. Seedling orchards established in southeastern U.S. Grafting technology for pecan developed but not heavily implemented until end of century. Rail transportation results in shipment of nuts to urban markets.

1900 to 1930

- Vegetative reproduction inundates southeastern U.S. with many selected varieties. Bordeaux spray 3-10 times recommended for nursery trees to prevent scab but large orchard trees considered unreachable. Plant resistant trees like Stuart, Schley and Frotscher. Early harvest, sanitation, burning and Persian insect powder used for insect control.

Pecan History and Arthropod Management

1930 to 1940

- Shelling machinery, transportation and consolidations of orchards into economic units increase marketability of pecans.
- Expanded production of most popular varieties like Stuart met with increasing levels of pecan scab on previously resistant varieties. Rosette linked to foliar zinc deficiency; lead arsenate and nicotine sulfate recommended for insect control. Spray machinery expensive, labor intensive and rarely employed

1940 to 1950

- Tank mixing of nicotine sulfate with needed fungicides recommended as "cheap insurance." Contract spray services expand with truck-mounted hydraulic sprayers. DDT used for pecan nut casebearer but aphids and mites appeared in epidemic numbers; toxaphene alone or mixed with nicotine sulfate controlled pecan nut casebearer without resurgence of aphids and mites.

A History of Pecan Arthropod Management

1950 to 1960

- Airblast speed sprayers become available; compared to hydraulic sprayers, cheaper speed sprayers allow single operator to spray same number of trees with one-fourth the water and still obtain better coverage. Effective and economical rosette, arthropod and pathogen control with conventional and newer chemicals resulted. Malathion adopted for pecan nut casebearer control. Chemical management of pecans became widespread.

1960 to 1970

- Cyprex and then Du-Ter replaced Bordeaux for pecan scab control and new carbamates, organophosphates and systemics became available for arthropod control. Mechanization for pesticide application, pecan maintenance, harvesting and processing burgeoned along with explosion of chemicals and solutions appeared faster than problems. Chemical schedules became routine and screening for efficacy dominated research efforts.

A History of Pecan Arthropod Management

1970 to 1980

- Chemicals and Resistance: Carbaryl became chemical standard for pecan weevil management, phosalone for other arthropods, Benlate and Du-Ter for pathogens, and NZN or zinc sulphate + uran for rosette. First case of pesticide resistance in pecan was a pathogen (causal agent for pecan scab) to Benlate in 1975, followed by hickory scorch mite resistance to carbamates and organophosphates in 1979.
- Synthetic pyrethroids introduced late in decade. Integrated Pest Management (IPM) philosophy develops and spreads across agriculture due to widespread pesticide resistance by arthropods, secondary pest outbreaks like aphids, mites and leafminers due to broad spectrum pesticides killing natural enemies and societal concerns about environmental pollution.
- Pecan industry buffered from many of these problems because of the surfeit of chemicals for all pests and lagging problems of resistance due to remaining management diversity. Aphids were viewed as a major problem in El Paso Valley of Texas and increased reliance on natural control by predators and parasites resolved their problem.
- Pest Management: Increased attention paid to developing economic thresholds of important pests, refining understandings of basic biologies to predict and manage pests, to identify and rely on natural enemies of pests and other IPM strategies. Pecan IPM programs initiated in Alabama, Georgia, Texas and elsewhere late in decade. Widespread expansion of new pecan plantings of a few varieties occurred in Southwest and Mexico inside and outside the native range epitomizing the drastic narrowing of genetic diversity in the natural pecan population compared to cultivated varieties.

A History of Pecan Arthropod Management

1980 to 1990

- Arthropod resistance to pesticides becomes widespread and Federated Pecan Growers declare aphids the most destructive pest in 1985, refuting the contention that the pecan industry had adopted IPM without the normal cycle of subsistence, exploitation, crisis, disaster and finally integrated control.
- Modeling efforts and basic biological studies on pecan nut casebearer, pecan weevil, hickory shuckworm, pecan aphids, pecan scab and other pests began to be implemented into management programs.
- Phosalone withdrawn from market in 1989.
- Implications of continued transition from diverse native and seedling trees to increased genetic uniformity of vegetatively propagated varieties on ability to manage diseases and arthropods became ever more apparent, continuing a trend observed at least half a century earlier.