

# Good Agricultural Practices for Pecans in Mississippi



## Mississippi Pecan History

Pecans are well adapted and widely grown throughout Mississippi. Where the proper varieties have been chosen, good success can be expected near the Gulf Coast and the Delta, but other areas of the state can support pecan production, as well.

Historically, numerous varieties originated in Jackson County, many of which have no commercial viability today. In the 1920s and 1930s, the five most prominent varieties in the southeast were Alley, Pabst, Schley, Success, and Stuart, all originating in Jackson County. Of the historical varieties, only Stuart, Schley, Success, and Desirable continue to be of commercial importance today.

Nearly 75 percent of pecan production in Mississippi is from improved variety trees. The remaining trees are native or seedling; some of these are in orchards and some in natural groves along the river bottoms in the Delta area. Several hurricanes, including Camille and Katrina, devastated pecan orchards in the six counties near the Gulf of Mexico. Many orchards were entirely destroyed and others severely damaged.

In general, Mississippi growers produce, harvest, and market 2 million to 4 million pounds of pecans per year, including improved varieties and natives, from more than 14,000 acres. In the 1930s, production ranged between 5 million and 6 million pounds annually. During the 1960s, the average annual production of pecans ranged from 15 million to 20 million pounds, with the largest harvest during that decade coming in at 30 million pounds. As a state, average yields may be as low as 200 pounds per acre, but intensive and standard orchards in a good year can produce 1,000 pounds or more per acre.

## Orchard Management Systems Used in Mississippi

Orchard establishment involves an overall knowledge of proper pecan production, including these areas:

- site evaluation
- site preparation
- facilitating surface drainage
- irrigation establishment
- marking rows for tree placement
- planting
- irrigating
- controlling weeds
- fertilizing
- spraying foliar zinc
- central leader tree training
- preventing foliage and nut fungi
- killing or preventing leaf-feeding insects, rodents, and wildlife

Management systems within Mississippi pecan orchards widely vary. In general, at least four systems are used:

- intensive
- standard
- minimal
- native (seedling)

Intensive management includes improved varieties on deep, well-drained soils with irrigation, herbicides, controlled nitrogen fertilization, foliar zinc sprays, stress/crop load management via trunk shaking, integrated pest management (IPM), tree stocking (density) management via tree removal or mechanical hedging, and mechanical harvesting.

Standard management includes improved varieties on deep soils with occasional irrigation, sod orchard floor, nitrogen fertilization during heavy crop seasons, at least one foliar zinc spray in the early season, no crop load management, minimal IPM, spacing varying from wide to over-crowded, tree age varying from 10 years to more than 75 years, and harvesting varying from hand to semi-mechanical to full mechanical harvesting.

Minimal management involves mowing the orchard sod floor in years with a crop and harvesting, but few, if any, additional inputs.

Native, or seedling, pecan orchard tree spacing varies greatly from grove to grove, but 50 percent or less shading of the acreage from tree canopies is ideal to promote both nut production and grass growth for grazing (if desired). Native trees bearing good-quality nuts are retained, and low-bearing trees, trees that produce low quality nuts, disease-susceptible trees, and crowded trees are removed over time.

Variability exists in native grove floor management, but low-mowed or grazed grass with no brush or weeds is ideal. One insecticide spray during heavy crop years is standard to control an early-season insect pest, the pecan nut casebearer. This spray is often tank-mixed with foliar zinc to control rosette. However, it is also common not to spray the trees at all. Orchards with pecan weevils must be sprayed.

In Mississippi, groves with native or seedling trees are most amenable to certified organic production. Three years of compliance with state and federal laws can qualify a site, orchard, and system for organic certification. Only organic (OMRI-approved) pesticides and fertilizers can be used.

Alternate bearing exists in all mature orchards with a heavy crop one year followed by a low crop or no production the next year. Alternate bearing is a major challenge for all growers, and some have made progress toward quality crops year after year with implementation of good management practices.

## **Orchard Site and Site History**

Unfortunately, no orchard sites in Mississippi can be assumed to have no inherent contributing risk factors for food-borne illness. However, previous or current land use may present greater or undue risk. Pecan orchards should not be established on sites that have been used as

municipal landfills or receiving sites for sewage sludge or other human waste. Historical use of a proposed pecan orchard site should be sought and documented when possible. Wildlife presence and domesticated animal husbandry on or adjacent to a proposed or existing pecan orchard site should be considered in assessing risk. Orchard land that contains heavily wooded borders or spots in the orchard with natural habitat will have higher presence of many types of wildlife.

New or existing orchard sites should have good surface water drainage. Flat topography is desirable for nut harvesting and other routine orchard practices; however, flat ground should have good internal drainage to prevent or minimize wet orchard floor conditions during harvest. Creeks or streams that may overflow into an orchard during rainy weather could represent a food safety risk. Since all river bottom orchards can flood, surface drainage should be managed to minimize the risk. Drainage ditches and low topographic areas that collect or maintain stagnant water should be similarly managed.

Record-keeping is always a good agricultural practice. Documenting weather events, farm practices, production levels, and sales is recommended for pecan orchards in Mississippi. Records can help in identifying the potential cause or source of contamination. Good records may help a grower show no neglect on his or her part if contamination should occur.

## **Plant Nutrition**

Annual fertilization is important to Mississippi pecan production. Inorganic or synthetic fertilizers provide the lowest risk for nut contamination in a pecan orchard. Organic fertilizer sources, particularly manures, can bring increased risk for nut contamination. Organic pecan orchards in Mississippi should comply with the USDA-certified organic protocols for fertilization. Soil sampling is an effective tool for pecan growers to determine the soil nutrient content and the amount of fertilizer to apply to an orchard floor. Contact your local MSU Extension office for more details.

## **Water Source and Irrigation**

Pecan production in Mississippi depends on water for irrigation and spraying more than any other single element. Pecan trees need 1 to 2 inches of rain or irrigation

water per week. Two inches are recommended in late season to fill out the nuts and stimulate shuck opening. An adequate water application reduces tree stress and potential shuck problems, including pre-harvest sprouting, sticktight, stem end blight, sticky shuck, and more. Such problems often mimic disease symptoms but in reality are simply physiological problems induced by heat, drought, and/or water shortage. Streams, rivers, wells, ponds, tanks, or other sources of irrigation or spray water that may contain contaminants should be tested before they are used and periodically retested for safety.

Pecan trees are salt-sensitive plants, and some irrigation sources in Mississippi may contain excess salt. Water should be tested for total salt content, sodium, boron, chloride, and other elements to determine its suitability for pecan production. It is important to maintain records of all water quality and microorganism testing.

## **Orchard Floor Management**

Most standard managed and all native and minimally managed orchards control grass, weeds, and brush by grazing and/or closely mowing sod or pasture grasses. Closely mowed sod expedites harvest practices and reduces nut contact with wet soil. Grazed orchard managers are encouraged to remove the animals a minimum of 45 days before shuck split and harvest of the earliest variety in the orchard to allow adequate time for decomposition of manure. Some pecan industry personnel advocate 180 days or no grazing at all to avoid any potential issues. The current recommended limit is 45 days, but more is advisable. Animals should not be rotated back to the orchard until the harvest is complete.

## **Integrated Pest Management**

Producers are encouraged to follow Integrated Pest Management (IPM) practices. Information on such practices can be found at <http://pecanipm.tamu.edu>. IPM includes management of diseases, insects, and weeds. Understanding how these pests are controlled in an orchard is critical. More information on herbicides can be found in Extension Publication 1532 *Weed Control Guidelines for Mississippi*.

## **Pesticide Spraying and Storage**

Pesticide sprays are needed to produce high-quality pecans. The key to making such applications is to read and follow label directions. The product label is the law and must be followed to ensure product safety to both the crop and workers. Pesticides should be stored properly in locked, well-ventilated areas, away from food sources, and in areas not prone to flooding. Pesticides should always remain in their original containers with the labels attached.

## **Orchard Sanitation**

A clean orchard and/or grove will not only increase the chance of producing a high-quality crop, but it will reduce potential pest problems, as well. Cups, cans, plastic bottles, and other trash should not be left in the orchard. Do not let pets roam free in the orchard within 45 days before harvest. Wildlife could be a potential problem for all orchards because not only do these animals consume the crop, but they can contaminate it, as well. Efforts should be made to greatly reduce wildlife activities in and around the orchard.

## **Worker Hygiene**

Workers should understand that they are working with a perishable crop that must be handled with care. Proper restroom facilities are essential in all work areas of the orchard, including fields distant from the main orchard headquarters. These facilities must be well-maintained and used by all workers. A drinking water source and hand-washing facility should be clearly marked, located near restroom facilities, and easily accessible for all workers. Employees should be encouraged not to work when ill. Develop appropriate sick leave policies to discourage working at the orchard while sick.

## **Harvest**

Every effort should be made to harvest the nuts as soon as possible; the shorter the contact time between the nuts and soil, the better. Harvest equipment should be in top working condition to minimize nut breakage because intact nuts are at lowest risk for contamination. In some locations, pre-harvest germination (vivipary) can be an issue. Early tree shaking must be done to reduce this stress-induced

phenomenon. Picking pecans from the ground by hand is still an effective method of harvesting; however, worker sanitation must be thoroughly emphasized. Each load should be identified as to the variety, block of the orchard where it came from, and date harvested, in order to be able to trace the nuts back to their origin should a problem arise.

## Cleaning the Harvested Crop

Moisture should be removed from pecans immediately following the cleaning process to prevent mold and stop quality loss. Cleaned pecans should be stored in super-sacks, field lugs, wooden boxes, or nylon mesh bags that are new or have been sanitized and stored in locations that animals cannot access. Containers or bags for holding in-shell pecans must not have been previously used to store peanuts. Records of lot, variety, orchard block, and so forth should be maintained through the cleaning and storage process to provide traceable origin of the nuts back to the orchard and field location of production.

## Proper Nut Storage

Proper storage of pecans is an essential part of marketing a quality product. Without proper temperature and relative humidity control, pecan quality and safety can be compromised. Controlling the water or moisture content of pecan kernels is very important for maximum storage life. Pecans that are harvested early can have a moisture content of 25 percent or more. All pecans should be stored at a moisture level of around 4 percent. Refrigerating or freezing pecans will significantly extend freshness.

## Food Safety on the Farm

Growers are encouraged to familiarize themselves with all aspects of this document and seek out other sources of information to aid in safe and proper handling of pecans. There are several university websites and publications that discuss food safety. Further education is encouraged. Contact Mississippi State University Extension Service experts for more details.

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