

## Chapter 1

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# **Good Agricultural Practices for Safe Growing and Harvesting of Peanuts**

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These Good Management Practices are not standards nor are they mandatory, but represent consensus thinking on best practices in each area and it is strongly recommended that they be followed.

## INTRODUCTION

The production of high quality, flavorful and wholesome peanuts begins at the farm. The producer is the first step in the process and is an important component within the process as peanut quality is established at the farm level. The entire industry should make every effort possible to maintain this initial quality.

Management practices to minimize the risk of contamination in peanuts need to extend from the field all the way through shelling, processing, packaging and delivery of the finished product to the consumer. Good Agricultural Practices (GAPs) provide guidelines to producers on how to minimize hazards during production and harvest. They also serve as the first step in the overall food safety system for the peanut industry. To the producer, GAPs focus on reducing rather than eliminating potential sources of contamination with the understanding that elimination of all potential risks is considered impractical and impossible.

As producers adopt and implement GAPs, it is important to remember that there are no uniform approaches to GAP that address each individual producer's specific management program. These guidelines are merely recommendations based on the most common peanut production practices; within each peanut production region and even from farm to farm there may be unique circumstances or management practices that influence the associated food safety risks.

## A. PEANUT PRODUCTION PROCESS FLOW



## **B. CRITICAL AREAS**

### 1. Documentation

Adequate documentation not only benefits the individual grower in their operation, but also provides key elements to the basic food safety system. Growers already maintain documentation for various aspects of the farming operation. Growers should recognize that these records are important to food safety enhancement. Important documentation records include, but are not limited to:

- Detail of prior farm ownership and cropping history
- Information regarding variety and plant date
- Crop management activities during the growing season
- Pesticide application information
- Worker training
- Fertilizer and soil amendment use history
- Pest reports from scouts or consultants
- Equipment maintenance and sanitation schedules

### 2. Employee Training

Trained, efficient employees are an asset to any operation. Employees that fully understand their roles and responsibilities within the operation are critically important to the production of safe, high quality peanuts. Many local and state agencies offer training programs for pesticide application and worker safety issues. Employee training should include:

- Pesticide application and worker safety
- Proper equipment calibration, maintenance and operation
- Proper equipment sanitation

### 3. Land Selection and Rotation

Site selection and crop rotation serve as the foundation for the peanut production system. Peanuts are typically produced in sandy to sandy loam soils. Crop rotations of three years or longer provide an opportunity to improve peanut yield and quality by reducing diseases, foreign material and chemical residue. Organic matter content often increases and overall soil quality is improved. Weed control efficiency is enhanced because many hard-to-control weeds in peanuts can be effectively controlled in rotation crops. Things to consider:

- When selecting fields to plant peanuts, select fields which do not have excessive foreign material.

- Identify fields that are not prone to contamination from other sources.
- Know the history of your field. Are there any previous uses which may have increased the potential for contamination?
- If grazing livestock is a component of the overall crop rotation system, growers should schedule livestock grazing operations within the crop rotation sequence, preferably so that peanuts do not follow the livestock grazing operation. However, if this is not possible, it is recommended that livestock be removed from peanut fields in late winter or early spring-of the year peanuts are to be planted.

#### 4. Fertilizer and Soil Amendments

Peanuts respond better to residual soil fertility than direct fertilizer applications. For this reason, the fertility program for the preceding crop is extremely important. Growers have several options available when deciding what type of fertilizer to apply to the rotation crop or directly to the peanut crop. With recent higher costs associated with inorganic fertilizers, many growers use organic fertilizers due to their lower costs. The specific type and amount of fertilizer applied to the preceding crop will be dictated by the needs of the crop based on yield goals, the amount of available nutrients in the soil, and applied according to soil test. From the perspective of Good Agricultural Practices, there are some things to consider when deciding to use organic or inorganic fertilizers and soil amendments. These include:

- When using organic or inorganic fertilizer and soil amendments, be sure that the material does not contain heavy metal residues or excessive nutrient amounts that could be phytotoxic to the plant and predispose it to disease and damage.
- Growers should make every effort to avoid applications of large quantities of manure to soils with low existing microbial activity. Crop rotations with high residue crops increase soil organic matter leading to better soil aggregation, which provides more aeration and water infiltration. These soils also support high soil microbial activity and generally poor persistence of introduced microorganisms.
- The use of raw manures is not recommended for peanut production. However, if raw manures are used, there are some specific things to consider:
  - Stacked and aged manure is not the equivalent of properly composted material.
  - If raw manure is part of a fertility program, application should be made to a rotational crop preceding peanut. If needed for the peanut crop that year, application of material should occur prior to March 1<sup>st</sup> and be incorporated into the soil.
  - Raw manure piles should not be stored on or near peanut fields or in areas where water runoff could carry manure into peanut fields.

- If using composted manures, the source or supplier of the compost should prepare the compost according to the following standards outlined in 7 CFR 205.203 National Organic Program.

#### 5. Irrigation Water Guidelines

As with many agricultural commodities, peanuts have a high water demand for optimum yield and quality. To ensure maximum yield potential, many growers provide supplemental irrigation to the peanut crop. The source of this irrigation is typically from underground aquifers, but some growers use surface water. Since the edible portion of the crop is below ground and not directly exposed to overhead irrigation, and the majority of the irrigation water used is from deep underground aquifers, the associated microbial food safety risk should be relatively low. Below are suggested guidelines to help ensure that microbial food safety risk associated with irrigation water remains low.

- Review location of all sources of irrigation water, both wells and surface. Ensure there are no open, deep water percolation channels for underground aquifers. These could provide a point of entry for contaminated surface water to infiltrate the aquifer. Ensure there are no large confined animal feeding or other livestock operations nearby that could allow runoff of animal waste to contaminate water sources.
- Protect groundwater from chemical contamination by mixing and loading pesticides away from wells or other water sources.
- If chemigation practices are used during the course of the growing season to apply approved pesticides, all necessary equipment should be in place per local, state, and federal guidelines for such applications. This typically includes the proper installation and operation of check valves and other backflow prevention devices.

#### 6. Animal Exclusion and Pest Control

All animals, both wild and domestic, are potential sources of food contamination. Feces are usually considered the primary source of pathogenic organisms from animals, but since animals come in contact with soil, manure and water, they can easily pick up other contaminants from these sources. Therefore the exclusion of animals from peanut fields is an important component of the growers overall sanitation program.

#### 7. Pesticide Use

There are many disease, insect, and weed pests that can significantly reduce yield and quality of peanuts. Growers often utilize a combination of management practices, also known as integrated pest management, to control these. Integrated pest management (IPM) uses combinations of pesticides, cultural practices, biological control, and crop management practices. The goal of IPM is to use a combination of pest control methods to reduce input costs, unnecessary pesticide

use, maintain food safety, and help growers profitably attain maximum yields. Peanut pegs and pods develop underground and are in constant contact with the soil; therefore, it is particularly important to control insects and diseases that can damage pegs and pods. Pod damage can reduce yield and quality and predispose peanuts to invasion by fungi that can result in aflatoxin contamination or possible contamination by other microorganisms that can create a food safety risk. There are some factors to consider for general pesticide use:

- Apply pesticides only as directed. Read the label on each pesticide container before each use. Apply only to labeled crops at rates and intervals specifically outlined by the label.
- Properly identify the pest and use the most efficient pest control method.
- Avoid drift by delivering pesticides only to the target area.
- Pesticide handling should be controlled through every phase of use. Application should only be performed by individuals that meet local, state, and federal guidelines for using and applying restricted use pesticides.
- Thorough training and documentation of personnel responsible for using and applying pesticides is extremely important. Personnel should also know the dangers and food safety risks when pesticides are handled or applied inappropriately.
- Never mix pesticides or drain tanks near wells, streams, or other surface water sources.
- All pesticides should be stored in an appropriate manner in a safe and secure facility. Pesticides should be stored in their original containers with labels intact.

## 8. Equipment Maintenance and Sanitation

Peanut handling starts with digging and ends at the manufacturer. Growers start the process at the farm level with harvest. Harvest operations include digging, combining, and curing. The equipment used during harvest is complex and performs many functions during the process. Peanuts are removed from the soil, excess dirt is removed from the pods and they are inverted and allowed to dry before combining. Peanut combines remove the pods from the plants and then separate any excess plant material or debris from the peanut pods, which are then transferred into trucks or trailers to be sent to a peanut buying point for grading and additional cleaning and possibly more curing. The complexity of the equipment requires extensive maintenance and sanitation prior to harvest. Maintenance and sanitation helps the grower ensure that a minimal amount of foreign material and debris enters the shelling plant from the field and microbial contamination is kept to a minimum. Some guidelines to consider when preparing your equipment for harvest:

- Carefully inspect equipment for mechanical problems that could cause metal to end up in the farmer stock peanuts.

- Properly clean harvest equipment and trailers prior to harvest to remove old peanut crop debris; rodents, insects and bird nests that may be present, and remove all dirt that accumulated on the harvest equipment while being stored in the off-season.
- Inspect and clean trailers to prevent cross contamination from other crops such as corn or pecans.
- Adjust equipment to minimize the incidence of loose-shelled (LSKs) and damaged kernels. Loose-shelled kernels are peanut kernels that are inadvertently removed from their outer shell during the harvesting and handling process.

### Food Safety

Food safety is an issue that requires all segments of the industry to work toward a common goal to provide the safest and most wholesome product possible to the consumer. Good agriculture practices provide guidelines for growers as a starting point in preparing a food safety system for the industry. Good agriculture practices can be customized to fit individual growers and regions and it is the responsibility of the user of this document to verify that these guidelines are appropriate for its operation. Successful implementation of a GAP program is not based on the specific GAPs, but rather the ability of the individual grower to become aware of on-farm hazards and to develop a personal sense of commitment to providing the safest, most wholesome product to the next level within the supply chain.

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