



UNIVERSITY OF
FLORIDA

EXTENSION

Institute of Food and Agricultural Sciences

SS-AGR-187

Producing Quality Peanut Seed¹

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Seed normally constitute a major cost of producing peanuts, and although costs may decline to some extent because of provisions in the 2002 Farm Bill, they will remain a significant portion of the production costs. Peanut seed are often difficult to grow, store, and process. The seed are especially fragile after shelling because the thin skin offers limited protection from physical and other damage. Anyone planning to produce peanut seed should be prepared to provide the best care possible to the seed.

Also before producing peanut seed, the grower should be aware that the Peanut Variety Protection Act (PVP) and the awarding of utility patents to the high oleic characteristic may limit the production or sale of seed of certain varieties. See Agronomy Fact Sheet SS-AGR-186 Peanut Variety Protection for more information.

The three major components of good peanut seed quality are purity, germination, and vigor. Seed certifying agencies provide information and inspection services that are intended to ensure that only high-quality seed are made available to growers.

Purity

Each and every seed sample of a variety should be genetically the same. Purity means that there are no seed of other varieties of peanuts or other crops present and that there has been no contamination by other varieties. To ensure purity, seed certifying agencies require documentation that the original source of seed meets purity requirements. Practically all peanut seed are sold as a class of certified seed, and certification is usually required if plant variety protection is obtained. When a peanut breeder releases a variety, only a few seed are available, so a systematic procedure is started to increase the supply that will be adequate for commercial use while protecting the purity of the seed. The most pure class of seed would be the "breeder's seed," which is the seed produced by the breeder of the variety. Breeder's seed is then turned over to the agency that will start an increase in the supply of seed for later commercial use. In Florida this agency is the Florida Foundation Seed Producer Association, and they produce the next generation or class from the breeder's seed, which is appropriately named "foundation seed". The next generation of seed is "registered seed," which is produced from the foundation class. The registered seed is then made

1. This document is SS-AGR-187, one of a series of the Agronomy Department, Florida Cooperative Extension Service, Institute of Food and Agricultural Sciences, University of Florida. Original publication date November 2002. Visit the EDIS Web Site at <http://edis.ifas.ufl.edu>.

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available for sale to farmers or to seed producers who produce “certified seed,” the next class in the certification program. The final step in the certification is a class called “second-year certified seed”. Naturally the supply of seed increases with each generation.

During each step of seed increase, procedures to ensure purity must be followed if the seed is to receive the certification label. First, documentation is required that the seed being planted were from an appropriate class of certification. Next, the seed must be planted in a field that has not grown peanuts of another variety or of a lower classification of the same variety in the last two years. The seed must also be planted a specified distance from any other variety of peanuts. These requirements help prevent contamination from volunteer or nearby peanuts, and also reduce the chance of cross-pollination by another variety. As the peanuts are growing, inspectors from the certifying agency check the field and remove any plants that do not have the visual characteristics of the variety being grown. At harvest, the combine must be inspected to be sure that there are no peanuts left in the machine from any previous harvests. Drying wagons and storage facilities must also be clean of any other peanuts before the new crop can be put in them. Purity also means the absence of other seed and foreign matter. Unlike most other seed crops, peanuts are not shelled as part the harvesting process. Due to the separate shelling process and the peanut seed being larger than most other weed seed, the presence of foreign matter and other weed seed rarely presents a problem in properly handled peanut seed.

Germination and Vigor

It is required that peanut seed meet germination standards before they can be sold as certified seed. While there may be no standard vigor tests, it is important that peanut seed germinate uniformly and establish a healthy stand of plants very quickly. Quite often the practices, both pre-harvest and post-harvest, that contribute to good germination also promote good vigor.

Uniform stands and growth will contribute to uniform seed being produced over the entire field, which in turn should result in uniform germination

and vigor. Preventing excessive pest problems also add to the chance that good germinating seed will be produced.

Calcium nutrition is very important, because a deficiency of this element in the soil will result in the seed being produced having reduced germination, even when yields may not be affected. The calcium must be available in the pegging zone of the peanut plant because the nutrient must be absorbed directly by the peg or pod. Little of the calcium absorbed by the plant roots is translocated through the plant to the developing peg or pod. Often a calcium deficiency is visible as shown by "black heart," in which the embryo is black even though the cotyledons are healthy. Even if the calcium content of the seed is not low enough for black heart to be exhibited, germination may still be below standards if calcium levels are restricted. For this reason, gypsum is recommended for all peanuts being grown for seed without regard to the soil calcium level. Soil calcium levels may be adequate for seed production without the application of gypsum, but this level has not yet been determined. Uptake of calcium by the pods may be slowed by conditions such as low soil moisture, so high soil calcium levels provide some protection during such conditions. Gypsum may be banded over the potential pegging zone, or a width of about 18 inches over the row, at a rate of 400 pounds per acre of dry material. For a broadcast application of gypsum, use at least 800 pounds per acre. Increase the rate as needed if the gypsum contains moisture, as will usually be the case with bulk loads. Apply the gypsum no later than the start of blooming because calcium uptake is most important as the peg enters the soil and the pod begins to enlarge. In the event of heavy rains soon after application, and before major pod development, a second gypsum application may be advisable to compensate for possible leaching losses of calcium and thus ensure the quality of kernels that develop later. Calcium uptake is through the water absorbed by the pods, so irrigation would be useful during dry periods to ensure consistent uptake through the season.

Harvest the peanuts when they are fully mature, as determined by maturity tests. Operate and adjust equipment to keep damage to the pods and seed to a

minimum. Excessive levels of loose-shelled kernels indicate that adjustments should have been made.

Do not dry the peanuts too rapidly, either in the field or on the wagons, as skin slippage and splitting of the kernels will be increased when they are shelled. Use extra care in handling peanut seed to keep damage to a minimum. In addition to possible damage to the embryo, physical damage of the hull may promote insect infestations during storage and provide a means of disease entry after planting.

Normally the peanuts would be delivered to the contractor after they are dried, but if they are stored on the farm, keep the moisture content of the peanuts from 8 to 10 percent during storage. Running air through peanuts stored in wagons during times of low humidity such as in the afternoon on cool dry days or using fans blowing over the peanuts in bins should be adequate to keep moisture at a safe level. Check seed moisture levels periodically to be sure that they are at safe levels.

Since the seed quality is easier to maintain in unshelled peanuts, wait as late as practical to shell the peanuts. During shelling and all other subsequent handling be gentle with the peanut seed, as they are very fragile. Apply approved seed treatment fungicides before bagging. After bagging, do not allow the bags of seed peanuts to be thrown or dropped onto floors or truck beds.

The final step in the seed production program would be to plant the seed under soil and weather conditions that favor rapid germination and emergence. Seed should be treated with an appropriate fungicide before planting to protect them from soil diseases. Be sure that the planter does not damage the seed during planting.