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## Peanut (*Arachis hypogaea*): A major and versatile crop

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Our seed bank specializes in underutilized crops, though we do also carry seed of a few varieties of major field crops like sorghum and maize. We do this primarily when we are able to obtain special varieties of these crops. While working for ECHO in Haiti, I had the opportunity to evaluate about 30 lines of peanut (*Arachis hypogaea*) from ICRISAT (International Crops Research Institute for the Semi-Arid Tropics) in Mali, West Africa. The top four of those, in terms of yield, were also evaluated in a variety trial conducted by an intern (Heidi Renkema) here at ECHO in Ft. Myers, Florida. We are now offering one of these lines (ICG 9257) through our seed bank. From our observations, it has a spreading growth habit (Figure 4) with two peanuts per pod. This variety seems to be resistant to foliar diseases, as it did not develop black spots as quickly as other varieties in nearby plots. As an indication of time to harvest, plants of ICG 9257 were harvested 145 days after seeding. While our supplies last, we are also offering trial packets of several other varieties, listed at the end of the article, with which you may wish to experiment.

The main purpose of this article is not to establish ECHO as a major source of peanut seed, but rather to provide introductory information for those who are new to the crop and may be wondering how peanut varieties or subspecies may differ from each other. I hope this information will serve as a starting point to help you relate to and work with the many farmers in developing countries who are growing peanuts as part of their livelihood, and will inform you as you investigate resources from research centers in your part of the world.

There are many reasons why a smallholder farmer might want to grow peanuts.

- **Protein** (21-36%). Peanuts are a less expensive source of protein than meat.
- **Oil** (36-56%). Peanuts are an excellent source of dietary oil—mostly “good” (unsaturated) fats (that do not contribute to unhealthy cholesterol as do trans fats). Peanut oil is an excellent source of linoleic acid, which is one of several omega-6 fatty acids that are essential for proper nutrition.



Figure 4. Peanuts (ICG 9257) growing at ECHO. Photo by Tim Motis.

*Table 1. Common traits and uses for each of four main groups of peanut varieties.*

| Variety group | Subspecies        | Growth habit         | Seed size    | Seeds/pod (number) | Primary uses                    |
|---------------|-------------------|----------------------|--------------|--------------------|---------------------------------|
| Virginia      | <i>hypogaea</i>   | upright or spreading | large        | 2                  | salted and roasted in shells*   |
| Runner        | <i>hypogaea</i>   | spreading            | medium       | 2                  | peanut butter, salted peanuts** |
| Spanish       | <i>fastigiata</i> | upright              | small        | 2-3                | oil and peanut butter           |
| Valencia      | <i>fastigiata</i> | tall, upright        | intermediate | 3-6                | roasted or boiled in shells     |

\*Salted in the shell by soaking in a mixture of water and salt, and then dried by roasting. This leaves a residue of salt on the peanuts inside the shells.

\*\*Peanuts can be roasted in or out of the shells, but runner-type peanuts are typically roasted after shelling. Adding a small amount of cooking oil (e.g. peanut oil) or melted butter prior to salting (if this is desired) helps the salt adhere to the peanuts.

Table 1. Common traits and uses for each of four main groups of peanut varieties

Peanut and 105 Ways of Preparing it for Human Consumption.” See **Table 1** for a few common uses of peanuts.

- **Nitrogen.** Being a legume, peanut can add nitrogen to the soil for subsequent crops.
- **Animal feed.** Peanut crop residue can be used as hay to feed animals. However, note that if the residues are removed from the field, the amount of nitrogen left for subsequent crops is reduced. Considering that the roots are dug up and often moved to another location to dry before the peanuts are removed, the land can be left quite barren if all the plant tops are removed from the field as well.

**Where will peanuts grow?** A peanut crop needs full sunlight and temperatures between 77 to 86°F (25 to 30°C). Thus, they are grown in places such as the southern United States, Africa, parts of Asia, Australia, and South America. Peanuts prefer light textured soils, such as sand or sandy loam, with plenty of calcium (for pod filling) and a pH ranging from 5.3 to 6.5. Soils with pH greater than 7.5 are unsuitable for peanut. Rainfall amounts of 30 to 49 inches (750 to 1250 mm) are needed for best yields.

- **Energy.** Pound for pound, peanuts provide at least the same amount of energy as beef.
- **Vitamins and minerals.** Peanuts are a good source of many essential vitamins and minerals, especially folic acid.
- **Food.** George Washington Carver, a noted educator and experimenter who lived in the late 1800s and early 1900s, published “How to Grow the

**How are peanut varieties classified?** Peanuts are believed to have originated in South America. Common names include groundnut, ground pea, and monkey nut. Varieties are categorized into four groups: Virginia, Runner, Spanish and Valencia. Typical traits of these variety types are outlined in Table 1.

Pods of most peanut varieties contain two seeds each, but Valencia-type pods can contain as many as five seeds. Virginia types produce the largest peanuts, while Spanish types produce the smallest. Varieties with a more upright growth habit produce pods closer to the base of the plant than do spreading varieties. Spanish types generally mature in less time (90 to 140 days) than the longer-season (120 to 190 days) Virginia-type varieties. Consider planting varieties with varying times to maturity to extend the harvest period.

**Do peanuts grow on trees?** No, they form underground. Plants begin to emerge within about two weeks of planting the seeds. About four to six weeks later, the plants will begin to flower. After self-pollination, the flower then withers and a “stalk” forms at the base of the ovary. This stalk quickly grows downwards to form what is called a “peg.” The tip of the peg buries itself two to three inches underground, where the pod then develops and matures (Figure 5). Flowering occurs during much of the growing season, which means that peanuts are in varying stages of development at harvest time. Harvesting occurs 110 to 160 days after planting, depending on the variety. The website [enchantedlearning.com/subjects/plants/pages/peanutplant.shtml](http://enchantedlearning.com/subjects/plants/pages/peanutplant.shtml) (<http://enchantedlearning.com/subjects/plants/pages/peanutplant.shtml>) has a diagram showing the anatomy of a peanut plant.

### **What are some basic steps in growing peanuts?**

**Planting:** Because the pods are formed underground, prepare ridges or a planting bed with deep, loose soil. Choose a planting date that allows the crop to become established during the rains and to mature during the dry season. If the peanuts mature during the rains, they can be infected by molds and become toxic. Individual seeds or unshelled pods can be planted. Spacing recommendations in the literature vary greatly; one source suggested 6 inches (15 cm) of space between seeds in rows 12 to 18 inches (30 to 46 cm) apart. Leave enough space for weeding between rows and for air circulation between plants to minimize the risk of plant diseases. Consistent spacing will encourage uniform pod development.

**Weeding:** This is especially important prior to flowering of the crop. If the crop is planted in rows, weeding can be done with animal-drawn implements. Otherwise, weeding is done by hand with hoes. In the early stages of crop growth, before the pegs have reached the ground, soil can be pulled towards the stem while weeding. After flowering, weeding needs to cease or be done with care, so as not to damage developing pods.

**Harvesting:** When is the right time to harvest? If you know the variety you are dealing with, the estimated days to maturity can serve as a guide. Another suggestion is to sample a few pods periodically and examine the seeds. Immature seeds are light-colored with thick, fleshy skin that is easy to rub off. In contrast, the skin of mature seeds is thin and papery and is not easily rubbed off the kernel. Harvesting should not begin before 50% of the pods contain mature seed. Harvesting should be completed by the time 70 to 80% of the pods have mature

seeds. A third suggestion is to examine the leaves. If the plants have lost most of their leaves to foliar diseases, they should be harvested. Finally, if seeds in the underground pods begin sprouting, the plants should be harvested.





*Figure 5. Photos showing the flower (left), peg (middle) and pod (right; developing on the end of a peg) of a peanut plant. Photos by Tim Motis.*

To harvest peanuts, loosen the soil if needed and then “lift” (term often used for harvesting) the entire plant (leaves, roots and pods). Take steps immediately to promote drying of the peanuts to proper moisture content (10%) for storage. For instance, shake the soil off the pods and place the plants in the rows with the foliage instead of the pods contacting the soil. In warm, dry weather, the harvested plants can be left in the field for a few days to cure. Otherwise, hang the plants to dry somewhere out of the rain, or remove the pods and dry them on screens.

**What are some problems to be aware of?** Diseases of peanut include early leaf spot (*Cercospora arachidicola*), web blotch (*Phoma arachidicola*), yellow mold (*Aspergillus flavus*), groundnut rosette virus and aphids. Aphids feed on plant tissues, but the primary concern is that they transmit groundnut rosette virus, which in periodic epidemics can cause massive yield losses.

Mold caused by *Aspergillus flavus* produces aflatoxin (see EDN 87). A few basic principles for minimizing contamination by aflatoxin are: 1) Avoid damage to pods by insects or during harvesting, because cracked pods allow entrance of moisture and mold. 2) Allow pods to dry immediately after harvesting. 3) Harvest when pods are mature (but not rotted) and, if possible, during dry weather. 4) Moisture content of stored peanuts should not exceed 10.5%. Storing seeds under low humidity helps keep seed moisture content low (see EDN 86).

Roughly 1 in 100 people is allergic to peanuts. Such an allergy often appears in the first years of life. Symptoms vary from minor irritation to more severe or even life-threatening reactions. Those allergic to peanuts need to avoid not only the peanuts themselves but also foods made from peanut products such as peanut oil.

**Requesting seed from ECHO:** Members of our overseas network may request a complimentary packet of ICG 9257. While our supply lasts, we will also supply ICG 6161 (another ICRISAT line similar to ICG 9257), ‘Virginia Jumbo’ (135 days to maturity; large seeds), and ‘Carolina Black’ (110 days to maturity; black-skinned

seeds slightly larger than Spanish types). We encourage you to also evaluate local varieties in your region, as well as other varieties you may be able to obtain from universities or research centers.

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