

Home Grounds Fact Sheet

Beans: A Garden Favorite

Beans are a mild flavored, nutritious vegetable and are fun and easy to grow. They are a good source of Vitamins A, C, B, and B², calcium, and iron. While the protein from shelled beans, green or dry, is incomplete, when they are combined with corn or other grains, they are a rich source of protein. They can be eaten fresh from the vine or dried for later use. Beans improve the fertility and physical condition of the soil. Nitrogen is added to the soil by the beneficial bacteria in the nodules which grow on the roots. These nodules work with bacteria in the soil to gather nitrogen from the air and convert it into a form useful to growing plants.

There are different types of beans - snap or string beans, lima beans, broad or fava beans, horticultural or green-shell beans, dry or field beans, and soybeans. With the exception of cool-weather fava beans, all beans are sensitive to frost and cold soil temperatures.

Types of Beans

Snap beans come in both bush or pole varieties, either green or yellow-podded. There is also a variety that has purple pods that turn green when cooked. The term "snap" is more widely used than "string" when referring to these beans, because on most of the newer varieties, there is no string to be removed before eating.

To extend the harvest of bush snap beans, plant at intervals of 2 to 3 weeks. These can be planted up until July 25. A heavy yield of pods from one planting is likely for a short time, followed by low yields. The harvest can be extended by keeping all pods picked from the plant as soon as they are ready to eat. Bush types grow from 18-24" in height and require no artificial supports. Bush beans generally mature within 50 to 55 days.

Recommended varieties: Provider, Tendercrop, Bush Blue Lake, Roma lines, Jumbo Gold Crop (wax)

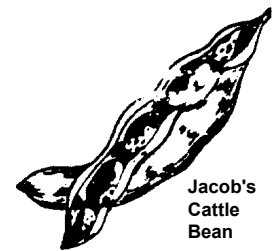


Pole Snap beans require the extra effort of erecting some means of support; but they are space efficient since they make use of unused vertical space. Plant them to the north of your garden so they don't shade other garden plants. Pole beans generally grow from 5' to 8'. They have an advantage over bush beans because they produce a higher yield of pods over a period extending until frost. Pick frequently for maximum yields. Pole Beans mature in 60 to 70 days.

Recommended varieties: Blue Lake, Romano, Kentucky Wonder, Fortex, Derby

Horticultural or Green Shell Beans

Green shell beans are grown for their large seeds that are shelled from their pods just before or just as the pods begin to dry from maturity. Most green shell varieties have highly colored pods and seeds when mature. These beans can be harvested in the green shell stage or allowed to remain on plants until fully mature and dry; then harvested and used as dry beans. Some green-shell beans are French Horticultural, white kidney-beans (cannellini), and French shell beans.



Dry or Field Beans - These are simple to grow and store and are very nourishing. Some mature between 80 and 95 days. Varieties of dry or field beans include pinto (has a thinner skin than the kidney bean), red kidney beans, black beans, white Northern beans.

Lima Beans - are a different species from the beans previously mentioned, but the cultural practices are almost the same as for other beans. Your soil must be warm 65° to 75°F in order to assure good seed germination. Yet, it is important to plant these as early as

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possible since they require a long growing season. They come in both pole and bush varieties. In our area, however, it may be better to choose bush varieties since they mature in approximately 75 days, whereas most pole varieties need 90 days to reach maturity. Try sowing some seed indoors for a head start on the season. Set the plants in the soil when soil temperatures have warmed up and when the plants are 4 - 5" tall. For best quality, lima beans are shelled from the green pods after they are fully developed but before the seeds begin to dry and mature.

Recommended varieties: *bush* - Fordhook 242 (large seeded), Burpee Improved Bush (large seeded), Henderson, Jackson Wonder, Thorogreen Early *pole* - Christmas Lima, King of the Garden

Soybeans - Soybeans are an extremely nutritious bean. They are excellent sources of protein. The beans are produced in pods containing 3 - 4 seeds, and come in shades of yellow, brown and black. Soybeans need a long growing season with temperatures averaging between 70° - 80°F. Try some of the newer varieties for northern gardens that mature in 75 to 85 days. Soybeans can be harvested either as dry beans or eaten in the fresh green stage.

Fava - Fava or broad beans are a cool weather crop, more commonly grown in Europe than here in the United States.

Plant fava beans as soon as the soil can be worked in the spring. They are erect, bushy plants and unless pinched can grow to a height of 3 to 4'. By pinching off the top shoots when blooms begin, you can encourage earlier and bigger crops. This practice can also discourage infestation of black aphids, since they tend to congregate near the tops of the plant. Fava beans mature in 80-90 days.

As the plants mature, some additional support may be necessary, since they may fall over from the weight of the beans. Pods can grow 6-15" depending on the variety.

If space is not at a premium in your garden and you don't have a succession crop planned for that space, try this established custom from Europe: Cut the plants back to 2" after harvest. Feed the plants well and they will sprout new shoots which will mature in the cooler months of September and October to produce another crop.

Favas should be harvested before the weather turns hot. They can be shelled and cooked green or dried for later use. If fava beans are to be dried, remove them from the shell to finish drying so they do not become moldy.

Note: Some people of Mediterranean descent are allergic to Fava beans. Eating fresh beans can produce a toxic reaction. This usually clears up in 24 hours in adults but can be much more serious, even fatal, for children. Dried favas usually do not have the same effect. Eat small portions at first to determine if you have this allergy.

Soil and Site Preparation

Beans need full sun for optimum growth. The soil should be light and well-drained with a pH between 6.0 and 6.8. Have your soil tested. See Home Grounds Fact Sheet A-1-0 for directions on collecting a soil sample. If lime is needed, apply and work thoroughly into the soil in fall or very early spring. Work compost or other organic matter into clayey soil, to make the soil more friable. Beans must have regular waterings. Do not allow the soil to dry out, but keep the leaves dry. Bottom watering using drip irrigation or soaker hoses is more beneficial than overhead sprinkling.

Before planting, apply 1 1/2 to 2 lbs of 10-10-10 or similar fertilizer to each 100 square feet of garden. Gardens that have been well fertilized in previous years may require only 1/2 to 1/4 this amount or none at all. If manure is applied, use fertilizers sparingly or not at all. Be careful not to overdo nitrogen since excessive plant growth delays maturity and can reduce yields.

When planting new gardens where beans have not been grown previously, home gardeners should consider treating bean seeds with an inoculant containing nitrogen-fixing bacteria. Inoculants are sold under a number of trade names and are not expensive, considering that treatments will last for years in most soils.

Cultural Practices

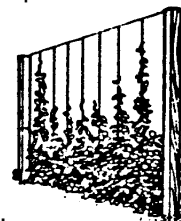
Beans are sowed directly into the ground after all danger of frost is over. Beans are easily killed or injured by frost. Plant them when soil temperature at planting depth is 60°F. Seeds will rot in cool, damp soil. Seed germination and plant emergence will be progressively more rapid as the soil temperature increases to 75°F.

All seed should be planted to a depth of 1 - 1 1/2". If your soil tends to be dry, plant the seeds 2 - 2 1/2" so they will come in contact with soil moisture.

It is important to keep weeds down. However, don't cultivate or hoe deeply. Deep cultivation cuts off bean roots that are near the soil surface.

There are several ways to support pole beans:

1. Use light woven wire, 3" to 4" mesh fences, fastened to solidly anchored 3" to 4" diameter posts at each end of the row. Stake the netting every 3 to 4 feet.
2. If wire fence is not available, strong single strands of wire, strung across the top and bottom of the posts with a cord or string woven between the wires will be satisfactory.
3. Pole beans will also grow on slender but stiff strong wooden poles set into the ground at 6 to 10' intervals. Smooth poles won't work for this purpose, since the vines may slide down the poles when laden with pods.
4. If there is an existing fence, staple some chicken wire to the south or west side.
5. Eight to ten poles can be tied together at the top to form a pyramid.



Harvesting

Break or cut each stem holding the bean pod (no harm is done if the bean breaks and stem with part of pod stays on the vine.) Do not pull on the plant when harvesting. Snap beans should be picked when pods are still small and tender. *Do not* allow them to get so big that pods bulge with seeds or the plant will stop producing. Bush beans usually need several pickings, a few days apart or every day if the weather is warm.

Integrated Pest Management (IPM)

Considerations

IPM is a common sense approach to pest control and plant care. It employs a number of measures to prevent, control or reduce plant problems. These include using resistant plant varieties, proper plant selection and placement, good aftercare and biological and/or mechanical controls. As a last resort, after all other remedies have been explored, a pesticide* that is least toxic to people and natural predators, can be considered. Prior to using any pesticides, plants should always be monitored for the degree of infestation and a sensible control measure considered.

* A pesticide is a substance that kills, or attempts to kill, a particular pest, e.g. **insecticide**, **fungicide**, **herbicide**, etc.

Diseases

Common blight, anthracnose and some viruses survive from one season to the next in the seed. For this reason it is not a good practice to save homegrown bean seed for planting. The best method of controlling many of these diseases is to plant (fresh) disease-free seed.

Anthracnose

Symptoms:

Pods will show small brown specks enlarging to black, circular sunken spots which may show the typical pinkish ooze of the slime-spores. Older spots often have narrow reddish borders. If seeds are infected they turn yellow, then rusty brown or black under the pod lesion. Leaf lesions are dark areas along veins on underside of the blade and on petioles. Seedlings may show stem spotting. Fungus is spread by splashing rain, tools and gardeners working with beans when they are wet.



Bean
Anthracnose

Control:

Avoid wetting foliage if possible. Water early in the day so aboveground plant parts will dry as quickly as possible. Avoid crowding plants; space apart to allow air circulation. Eliminate weeds around the plants and garden area to improve air circulation. Do not work with beans when they are wet. Do not save your own seed.

Bacterial Blight

Symptoms:

Leaf spots are at first very small, water-soaked or light green wilted areas which enlarge, turn brown, become dry and brittle, and have a yellow border around edge of lesions and often a narrow, pale green zone outside that. Leaves become ragged in wind and rainstorms. Reddish brown horizontal streaks appear in stem, which may be girdled and break over at cotyledons or first leaf node. Pod lesions are first dark green and water-soaked then dry, sunken and brick red, sometimes with a yellowish encrustation of bacterial ooze. White seeds turn yellow and are wrinkled with a varnished look.

Control:

See Control for Anthracnose.

Bean common mosaic virus strains BV-1 and NY 15

Symptoms:

Mottled, distorted leaves. Stunted plants. Leaves may be thickened and brittle and easily broken from plants. Poor yields.

Control:

Rogue plants - remove and discard or destroy entire infected plant along with immediately surrounding soil and soil clinging to roots. Use resistant varieties: Lancer, Provider, Blue Bush 274, Golden Butterwax, Royal Burgundy, Tendercrop, Improved Tendergreen, etc. Manage insect vectors.

White Mold

Symptoms:

Fluffy white mycelium grows over leaves, stems, or pods; general rotting of affected parts.

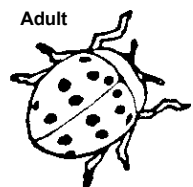
Control:

Avoid wetting foliage if possible. Water early in the day so aboveground plant parts will dry as quickly as possible. The following recommendations are very important: Avoid crowding plants; space apart to allow air circulation. Eliminate weeds around the plants and garden area to improve air circulation. In autumn, rake and dispose of all fallen or diseased leaves and fruit. Crop rotation is essential.

Insects

Mexican Bean Beetle

The Mexican bean beetle is relatively large and easily detected. Damage (lacelike leaves) is observed immediately. It looks somewhat like the ladybug beetle having the typical convex shape. However it is coppery yellow with 16 black dots, 8 on each wing cover. It likes lima beans particularly but does not care much for soybeans, although it will attack them. Larvae and adults feed on pods and stems as well as foliage. The adults winter over in rubbish or weeds, emerging in June in New York area. The females lay groups of



Adult



Larvae

orange-yellow eggs on underside of leaves. The eggs hatch in 5 to 14 days. Soft yellow larvae, 1/3" long and half as wide skeletonize the leaves, always working from underneath and eating out very regular areas in a lacy pattern. In New York area there are usually two generations a season.

Control:

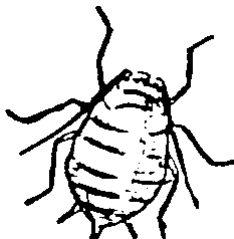
- Monitor plants for signs of insect pests. If there are only a few insects, pick off by hand and destroy.
- Plant early to avoid the first generation in June if the weather is warm enough.
- (see note A.)

Aphids

Leaves become curled and deformed; may have a shiny appearance from honeydew, or blackened from sooty mold. Plants may be stunted.

Control:

- Check for natural enemies such as gray-brown and bloated parasitized aphids (mummies) and the alligator-like larvae of lady beetles and lacewings.
- Wash aphids off with a hard stream of water. Apply early in day so plants may dry off.
- Insecticidal soap is usually effective but must be applied early in day to the undersides of the leaves.
- Horticultural oil may be applied, following label directions. (see note A.)



(For more information on Aphids, see Home Grounds Fact Sheet E-1-1.)

Leafhoppers

A white stippling on upper surface of leaves is a sign of leafhoppers. Severely affected leaves show tip or marginal burn, or appear completely dry. Undersurface of leaves often shows small white cast skins of insects and tiny dark varnish-like spots.

Control:

- Insecticidal soap may be applied when leafhoppers are present. (see note A.)

Seedcorn maggots

These are legless off-white grubs without a distinct head. They tunnel into and destroy seed or germinating seedlings.

Control:

- Avoid heavy manure or organic matter in the garden, which attracts maggot flies and encourages egg laying.
- Purchase insecticide-treated seed. Use gloves to plant.

Spider mites

On upper leaf surface a very fine whitish to yellowish stippling occurs. Leaves look burned when heavily infested. Fine webbing on undersurface of leaves gives gray appearance to portions of underleaf surface.

Control:

- Wash off with water occasionally as needed, early in the day. A hard stream of water directed at spider mites will remove many from plants, or use insecticidal soap. (see note A.)

Tarnished plant bug can be a serious pest for lima beans, but is not considered to be a nuisance to any other bean.

note A. Chemical pesticides are available. If you choose to use chemical pesticides, contact your local Cooperative Extension office for specific recommendations.

"This publication contains pesticide recommendations. Changes in pesticide regulations occur constantly and human errors are still possible. Some materials mentioned may no longer be available, and some uses may no longer be legal. All pesticides distributed, sold, or applied in New York State must be registered with the New York State Department of Environmental Conservation (DEC). Questions concerning the legality and/or registration status for pesticide use in New York State should be directed to your regional DEC office (631) 444-0340 or the appropriate Cornell Cooperative Extension specialist. Read the label before applying any pesticide. Cornell Cooperative Extension and its employees assume no liability for the effectiveness or results of any chemicals for pesticide usage. No endorsement of products is made or implied."