



FAVA BEAN *(Vicia faba L.)*

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Fava bean, actually a vetch, is an erect, leafy, winter or spring annual legume, growing from 2 to 6 feet tall. One or more thick, unbranched stems grow from the base of the plant. Compound leaves are composed of two to six large, broad, fleshy leaflets that have no tendrils. White flowers with black or dark purple markings occur alone or in groups. Large, flat, oblong seeds (500–3,000/lb) develop in pods.

Fava bean has a deep taproot from 1 to 3 feet in length.

Environmental preferences and limitations

Cold tolerance among fava bean cultivars varies, but most varieties winter-kill at temperatures below 15°F, and even the most winter-hardy winter-kill at temperatures below 10°F. Fava bean grows during cool weather when other vetches and clovers are relatively dormant, but does not tolerate heat well.

Fava bean can grow on a wide range of soils, from loams to clays, and under a variety of drainage conditions. However, it does not tolerate extended periods of saturated soils; and drought, especially at flowering, reduces seed production drastically.

Fava bean tolerates a wide range of pH (4.5 to 8.3), although low pH may delay the development of root nodules, thus preventing the plant from converting atmospheric nitrogen to plant-available form.

Uses

Fava bean is used as a winter or spring cover crop, green manure, silage, forage, hay, and vegetable. It is capable of producing large amounts of dry matter and accumulating large quantities of nitrogen (N), part of which is available to subsequent crops.

The large, deep taproot is ideal for opening up heavy, compacted soils. And although incorporated leaves decompose rapidly, stem residues persist longer and help to loosen clayey soils.

Fava bean is ideal for use in home gardens because it is easy to incorporate by hand or with small equipment.

Dry matter and N contributions

Dry matter and N accumulation in fava bean depends on the variety and can be highly variable. In a mid-Willamette Valley field trial planted in mid-September, a large-seeded cultivar winter-killed the year it was planted, and small-seeded cultivars winter-killed 2 of the 4 years they were planted.

The years the small-seeded cultivars survived, they produced 4.6 and 2.1 tons dry biomass/acre and accumulated 202 and 83 lb N/acre by mid-April.

Note that the variety 'Banner bean' was planted just 30 miles to the south of the

field trial during the same years and survived the winters, probably due to its greater cold tolerance.

Management

In areas of western Oregon where minimum annual temperatures are above 15°F, plant winter-hardy varieties in September or the first week of October. Plant in early spring where temperatures are colder.

Seeding rates for fava bean are 80–200 lb/acre for cultivars with smaller seeds (the Willamette Valley trial used 125 lb/acre) and 150–300 lb/acre for cultivars with larger seeds.

Best stand establishment is obtained by planting 1 to 3 inches deep (to moisture) into a firm, well-prepared seedbed, using a drill set to 30-inch rows or a common corn planter. The distance between plants in the row should be approximately 6 inches. Well-drained seedbeds, cool weather, and moderate moisture all favor good stand establishment.

Quick facts: Fava bean

Common names	fava bean, broadbean, windsorbean; bell, horse, tick, or field bean
Hardiness zone	8 or 9 (see Figure 1)
pH tolerance	4.5–8.3; optimum near 7.0
Best soil type	Wide range
Flood tolerance	Low
Drought tolerance	Low
Shade tolerance	No information
Mowing tolerance	Low
Dry matter accumulation	3.5 tons/acre
N accumulation	140 lb/acre
N to following crop	Half of accumulated N
Uses	Large taproot and persistent stem residues loosen compacted soils. Grows well in cool weather and fixes large amounts of N.
Cautions	Many varieties winter-kill some years in hardiness zone 8.



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Alternative seeding methods that can reduce seedbed preparation but require higher seeding rates are: drill into a rough seedbed prepared by disking, or broadcast over a rough or smooth seedbed and then disk lightly to cover the seed. If the soil is dry, irrigate or plant before a fall rain.

Because high seeding rates can make planting a fava bean cover crop expensive, some growers allow part of their fava bean cover crop to go to seed. Harvested seed provides stock for the following year's cover crop.

Fava bean roots need to be colonized by an *appropriate* strain of rhizobia bacteria to be able to convert atmospheric nitrogen into plant-available forms. Inoculating seed with the proper rhizobia bacteria ensures that the bacteria will be present when the seed germinates. Use fresh inoculant, protect it from heat and light, and apply it to seeds just before planting according to the manufacturer's directions. Cover broadcast seed with soil to protect inoculant from sunlight.

Fava bean can tolerate high mowing but does not withstand close mowing or grazing.

The best time to incorporate fava bean is at the beginning of blossom. Flailing or mowing before incorporation usually is necessary to break up the tall stalks.

Fava bean often is mixed with other legumes or cereals for use as a cover crop, green manure, forage, or silage.

Pest interactions

Pure stands of fava bean do not do a good job of suppressing weeds unless they are sown very densely. Planting fava bean in mixtures with other legumes or grasses improves weed suppression.

Many beneficial insects, including predatory wasps and lady beetles, are attracted to the nectar of flowering fava bean.

Fava bean also has extrafloral nectaries on its stipules, the leaf-like structures at the base of the leaf petioles. Extrafloral nectar is available to short-tongued insects that do not have access to the nectar of the legume flowers. Both beneficial and pest insects (e.g., lygus bug) feed on extrafloral nectar.

Fava bean is susceptible to aphid damage, especially from the bean aphid. Although aphids usually do not affect fava bean's utility as a cover crop, they can cause considerable damage to the seed. Broadbean weevils also can reduce seed yields.

Fava bean may be a host for the root-knot nematode (*Meloidogyne* spp.) so it should not be used in rotations with potatoes. Use of fava bean as a break crop has been reported to reduce the incidence of take-all in wheat.

Varieties/cultivars

Large-seeded varieties, usually grown as a vegetable, are classified as *Vicia faba* var *major*, and often are referred to as broadbeans or Windsor-beans.

Small-seeded varieties (var *minor*, *equina*, *faba*, and *paucijuga*), referred to as bell, horse, tick, or field beans, are used more commonly as animal feed, cover crops, and green manures. They seem to be better suited as winter cover crops in western Oregon because they are less susceptible to winter-kill. The variety 'Banner bean' is the most cold-tolerant variety planted in Oregon, surviving temperatures as low as 10°F.

For more information

World Wide Web

Orchard floor management information—<http://www.orst.edu/esp/short/weeds/floormgt.htm>

OSU Extension Service publications—eesc.orst.edu

The University of California, Davis cover crop information—<http://www.sarep.ucdavis.edu/sarep/ccrop/>

Oregon Cover Crop Handbook

This publication also is part of *Using Cover Crops in Oregon*, EM 8704, which contains an overview of cover crop usage and descriptions of 13 individual cover crops. To order copies of EM 8704, send your request and \$5.50 per copy to:

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Figure 1.—Oregon plant hardiness zone map. Fava bean normally will survive in **Zone 8** or any warmer zone. (Extracted from the USDA's national plant hardiness zone map, based on average annual minimum temperature in °F.)

Zone 4 = -30 to -20; Zone 5 = -20 to -10
Zone 6 = -10 to 0; Zone 7 = 0 to 10
Zone 8 = 10 to 20; Zone 9 = 20 to 30

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