

Faba bean has a long history of cultivation in The Netherlands. During the last 10 years, the area has expanded from ca. 280 ha, to 949 ha in 2019. Faba bean is mainly cultivated for feed, with an increasing interest in the area of food. The protein content is on average 30% DM. Faba bean yields are generally higher on clay (5.4 t/ha) than on sandy soils (3.6 t/ha), Yields are sensitive to fluctuations though, with top yields of 7.7 t/ha, that may drop to 2 t/ha in dry years or after severe frost. Protein yields thus vary between 330 to >2000 kg/ha. The cultivation of winter types is rapidly increasing. Faba bean contributes positively to soil quality (nitrogen fixation), phosphorus mobilization and biodiversity (pollinators).

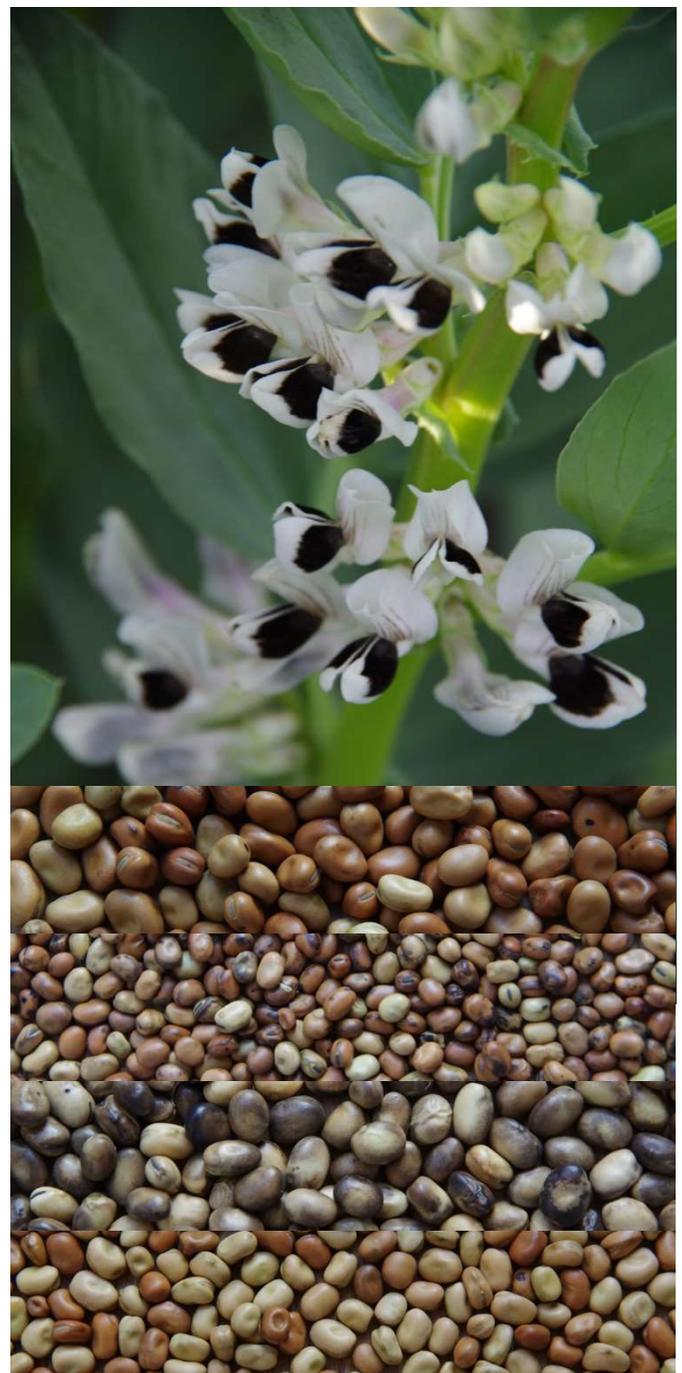
Field selection

Faba beans can be cultivated on clay and sandy soils, if soil pH is above 5.2. As faba bean is drought-sensitive, soil moisture availability is important. Faba bean is best cultivated under nitrogen-poor circumstances. As faba bean is sensitive for soil-borne diseases, rotation with other pulses should be more than 1:4. Rotation with faba bean itself preferably in a rotation of 1:6.

Sowing

Sowing time and density In The Netherlands, summer faba beans can be sown from the end of February until the first half of April. Winter faba bean is sown from October onward. Faba beans can be sown both broadcast and in rows with row spacing of up to 50 cm. Desired plant densities are 25 plants/m² for winter, and 35 plants/m² for summer faba bean. Small-seeded varieties may be targeted at 40 plants/m². Seed size of faba bean differs by variety, supplier and year, and can range from 400 to 800 grams TSW. Autumn-sown faba bean is characterized by strong tillering. When winter types are sown in spring, little or no tillering takes place. Sowing depth is 5-7 cm for summer- and 10 cm for winter beans. Sowing with mechanical seeders can be challenging because of the large seed size. Inoculation with nitrogen-fixing bacteria is only necessary at pH<5,2.

Variety choice Faba bean varieties can be divided into winter- and summer types, tannin-rich or poor, and vicine/convicine rich or poor varieties. On heavy clay soils, with no possibility of early sowing, winter types are preferred. However, winter hardiness of the present



varieties is not always sufficient for Dutch conditions. Tannins are mainly present in the seed hull. Low-tannin varieties have completely white flowers, while coloured varieties are high in tannins. Tannins reduce palatability of faba bean as pig feed. Vicine and convicine (v-c) are alkaloids which are present in both hull and kernel. High levels of v-c are undesirable in human nutrition as they may lead to acute anemia (favism) in persons with a genetically inheritable enzyme deficiency. In monogastric animals, v-c may decrease feeding efficiency. In herbivores, tannins or v-c are not restrictive to feeding.

Management

Weeds In conventional cultivation, pre- and post-emergent herbicides can be used, but some herbicide residues are injurious to legumes. True leaves of winter types which grow out after frost, may be killed by previously applied pre-emergence herbicides. In organic cultivation, frequent harrowing and hoeing is essential.

Pests and diseases The main pests of faba bean in The Netherlands are black bean aphids (*Aphis fabae*), which may also vector virus infections, and the pea leaf weevil (*Sitona lineatus*). The main fungal diseases are Chocolate spot (*Botrytis cinerea*) and Brown rust (*Uromyces viciae-fabae*). Under conducive conditions grain yield loss can be high. Crop rotation away from susceptible hosts is the major means to control Sclerotinia rot (*Sclerotinia sclerotiorum*).

Harvesting

Harvest time The harvest time depends on variety and winter or summer type, and ranges from end of July to end of August. Faba bean should be harvested in a fully ripened and dried crop. During sharp drying weather, threshing should be done early in the morning or in the evening, to prevent losses due to pod shattering.

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Yield (t/ha, 85% DM) and protein% of faba bean in The Netherlands; s/w: summer/winter, v-c: (con)vicine.

cultivar	s/w	v-c	tan	pl/m ²	2015	2016	2017	2017	2018	2018	2019	protein	protein
					sand	sand	sand	clay	sand	clay	sand	% in DM	kg/ha
Cartouche	s	+	+	30					2,9		2,4	29.5-30.2	603-740
Divine	s	+	-	30		3,5						29.4	868
Fanfare	s	+	+	30		4,2						28.8	1036
Fuego	s	+	+	30	2,9	4,1	7,2		3,8	7,1	2,5	25.9-32.7	559-2016
Imposa	s	-	+	30	2,6	3,7	7,0					30.5-34.3	961-2032
Lynx	s	+	+	30			6,7					32.5	1855
Pyramid	s	+	+	30		4,9	6,4				2,6	26.1-32.4	575-1756
Taifun	s	-	+	30			6,9		4,0	6,7	2,7	28.7-33.7	655-1985
Tiffany	s	+	-	30		4,5	6,3		3,5	7,5	2,4	27.4-35.7	553-1927
Victus	s	+	-	30							2,1	26.2	481
Bumble	w	+	+	25			5,4	7,7	2,1	2,7		26.9-27.8	490-1766
Diva	w	+	+	40			4,9	5,4	1,6	2,0		29.1-31.4	441-1324
Hiverna	w	+	+	25			4,4	6,4	2,4	4,8		28.5-30.7	627-1546
Honey	w	+	+	25					1,7			29.5	432
Organdy	w	-	+	25			3,6	5,2				31.7-32.1	981-1395
Tundra	w	+	+	25			5,2	7,5	1,3	2,5		28.1-29.9	330-1855
Wizard	w	+	+	25			5,4	7,3	1,6	2,5		28.8-30.4	403-1783
average					2,7	4,2	5,8	6,6	2,5	4,5	2,4		

