

PRODUCT DATA SHEET

Fennel

Botanical name	Foeniculum vulgare Mill.
Seeding rate	Grown as sweet fennel, bitter fennel or Florence fennel: 2.5-5 kg/ha when sown on its own As a catch crop or on greening or flower pastures: 8-10 kg/ha when sown on its own
Distance between rows	Grown as sweet fennel, bitter fennel or Florence fennel: 30-50 cm Catch crop and flower pasture: similar to cereals, 12 cm
Sowing period	Grown as sweet fennel, bitter fennel or Florence fennel: mid-late March For use as a catch crop or in flower pastures: later, up to late May
Sowing depth	2-3 cm

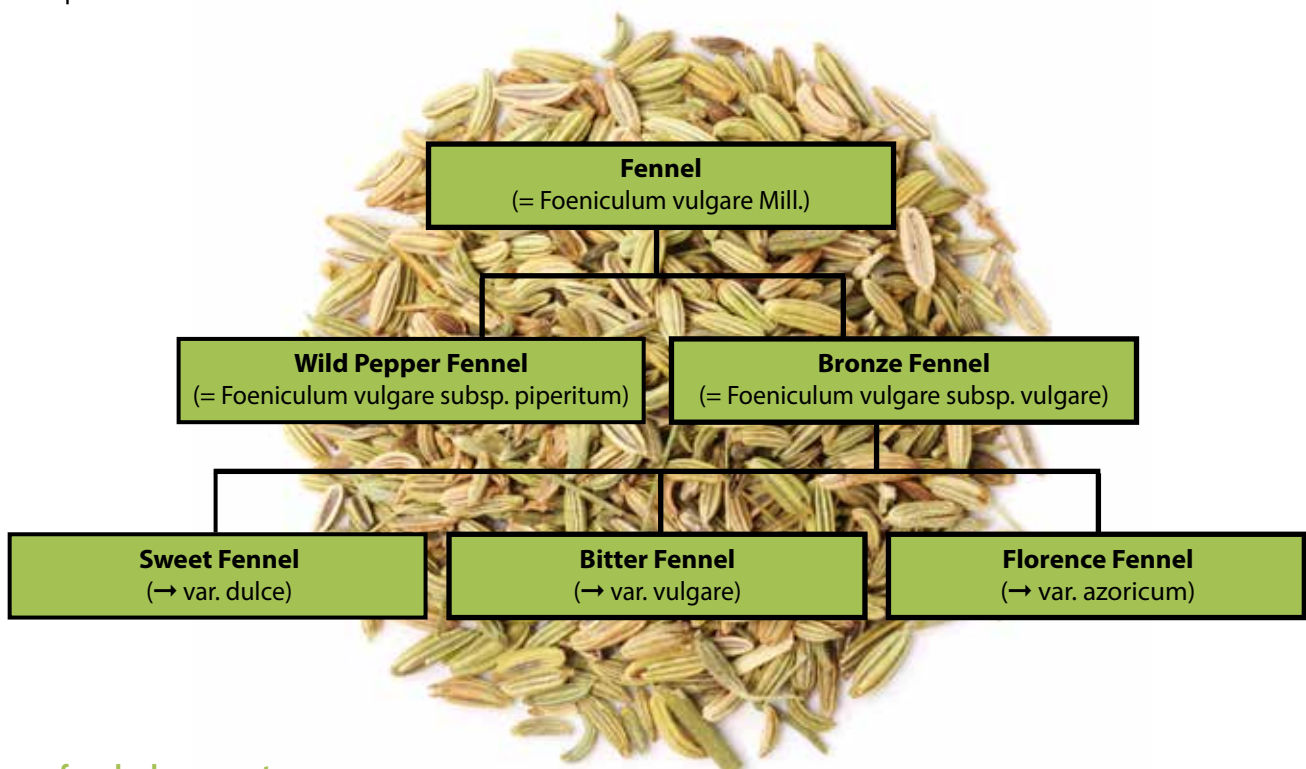


General information and usage

- A globally prized medicinal plant (leaves and seeds) used as a vegetable (stem base) and herb (seed)
- ▶ Fennel can relieve cramps and flatulence, as well as stimulating the appetite
 - ▶ Winter fennel cultivation is possible, sown at 9 kg/ha in late August; in Central Europe, summer cultivation with spring sowing (see above) is more common
 - ▶ In recent years, fennel has been used in Central Europe as part of flower pastures and as a catch crop to loosen soil

Botany

- ▶ Family: Celery family (Apiaceae)
- ▶ Genus: Foeniculum
- ▶ Origin: mainly from the Mediterranean basin, but also native to parts of Africa, Asia and South America
- ▶ Fennel is the only species from this genus
- ▶ As a species, Fennel is comprised of two subspecies and two varieties



PRODUCT DATA SHEET

Morphology

- Biennial to perennial herbaceous shrub growing to heights of 1-2 m
- Very deep, turnip-shaped taproot
- Reproductive flowering phase first occurs in the second year, with numerous blue-green stems emerging from the vegetative leaf rosette
- Leaves finely pinnate
- Yellow flowers emerge from umbels with a diameter of around 15 cm

Varieties and seeds

- A small number of varieties are cultivated as annuals or biennials, especially bitter fennel or fennel for vegetable production
 - Two varieties of Florence fennel have been approved for vegetable production in Germany
 - One bitter fennel variety has been approved in Germany
- In Germany, Florence fennel has the largest area under cultivation

Climate requirements

- Thrives in many different climates; prefers warm or mild-moderate, humid climates
- Maximum yield realised under adequate watering
- Sweet fennel and bitter fennel have almost no frost tolerance, while Florence fennel does tolerate light frosts

Soil requirements

- Well-suited for early and quick-drying soils, not recommended on soils that tend to form a crust
- Ideally humus-rich, deep, medium-heavy to heavy soils with low weed pressure
- Can be cultivated on fen-like sites
- Florence fennel has a high water demand
- Light, dehydration-prone and alkaline soils are less suitable

Crop rotation

- The sequence of crops depends on the planned purpose of cultivation
 - These may include...
 - ... open-air cultivation in parcels when planting Florence fennel
 - ... open-air field cultivation following direct seeding of sweet fennel, bitter fennel or Florence fennel
- Low autotolerance → 4-5 year cultivation interval
- Preceding crops can be anything other than legumes or other members of the celery family
 - Ideally, the preceding crop should leave low amounts of residual nitrogen in the soil
- Cereals are suitable as a subsequent crop; maize and root vegetables are less well-suited due to the possibility of volunteer plants



PRODUCT DATA SHEET

Soil preparation

- The aim is to have a well-distributed, even, finely crumbled and weed-free seedbed, which allows for direct sowing for vegetable cultivation

Objective	New cultivation
Measures	Basic soil preparation (primary preparation) clear by ploughing on heavy soils, a cultivator is also a possibility. Secondary processing using a mill or rotary harrow for a fine, well-distributed seedbed.

Sowing

- Target stand: 10,000-35,000 plants/ha
- Field emergence generally occurs 3-4 weeks after sowing

Crop protection

- Adequate weed control, chemical and mechanical processes may be used
- The disease and weed pressures are generally low under field conditions in Central Europe
 - The cultivation of dill and parsley should be avoided, since they are hosts for potential fennel pests including aphids, concealer moths and anthracnose of leaves and stems.



PRODUCT DATA SHEET

Fertilisation

- Based on soil testing (comply with the fertiliser regulations!)

Nutrient removal by Florence fennel per year in kg/ha (expected crop yield of 2,500 kg/ha wet weight):

	Total N	P ₂ O ₅	K ₂ O	MgO
Total	69	32	24	11

Nutrient removal by Florence fennel per year in kg/ha (expected vegetable yield of 15,000 kg/ha wet weight):

	Total N	P ₂ O ₅	K ₂ O	MgO
Total	59	24	173	11

- If mineral fertiliser use is planned: Carry out measures prior to sowing, since young plants are very sensitive to elevated salt levels in the soil
- On soils with high N replacement, N fertiliser can be omitted
- On soils with low N replacement, divide the fertiliser into three smaller applications to prevent leaching

Harvest and treatment

- Vegetable yield: up to 15,000 kg/ha wet weight
- Seed threshing with normal combine harvester and front-mounted cutter at 30-50 cm stubble height
- Harvest should take place once the fruits on the upper umbel begin to turn brown and the fruits on the fully developed lateral umbels have a grey-green colour (→ umbel stems remain green at this point)
 - This generally occurs by mid-late October under annual production
 - In biennial or perennial cultivation, this stage is generally reached by mid-September
- Seed yields: 2,000-8,000 kg/ha wet weight with an essential oil content of 3.4-7.0% (main components: trans-anethole, fenchone and estragole)
- Most fennel seeds remain relatively unripe at harvest
 - Seed moisture levels of 20-40% are typical
 - Quick drying to 14% seed moisture is desirable
 - Drying conditions: 8-24 hours at up to 35°C



Any questions? Please feel free to contact us!

☎ +49 2151 - 44 17 0

✉ info@freudenberger.net