

Characteristics of asparagus and its cultivation

Taxonomy and origin

- *Liliaceae* family
- *Asparagus* genus
- *Asparagus officinalis*
- Native of, and domesticated in the Eastern Mediterranean region; first for medicinal purposes and later as food.

Importance

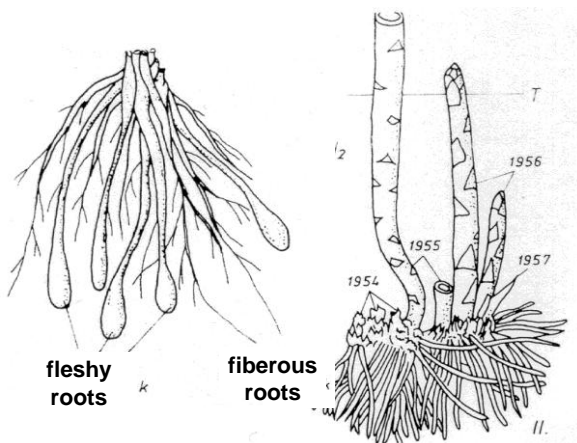
- In Europe a high priced vegetable, marketed mainly in fresh form
- **World:**
 - 1,5 M ha, 8.7 M t, 5.7 t/ha
 - China 88%, Peru 4.3%, Mexico 2.5%, Germany 1.4%
- **EU:**
 - 546 e ha, 301 th. t, 5.4 t/ha
 - Germany 40%, Spain 20%, Italy 15%, France 7%, The Netherlands 6%

Nutritive values and usage

- Doesn't have a high nutritive value, except its moderately high vitamin C content; also contains rutin
- Grown for its tender, unexpanded, young shoots (spears) in temperate regions of the world
- Two main types: white (blanched) and green
- Green spears have higher nutritive value
- In Europe it is mainly grown for fresh market, sometimes processed (mainly canned, sometimes frozen or dehydrated)
- Usually consumed in cooked form

Morphology

- Monocotyledonous, perennial, dioecious plant
- **Root system:** crown: composed of fleshy roots, rhizomes and buds; there are fleshy roots responsible for storage and fibrous roots responsible for water and nutrient uptake
- **Stem:** spears are formed from the buds; fern - 2 m tall with cladophylls (modified stems looking like leaves) on lateral bunches; male plants have smaller, but more spears
- **Flower:** dioecious → unisexual flowers, insect pollinated
- **Fruit:** round red berry with 3-4 seeds
- **Seed:** round, 18-20 g thousand seed weight



Classification of cultivars

- Pure lines of male and female plants
- **Based on the production of cultivar**
- Open pollinated cultivar
- Hybrids
- Pure lines of male plants
- **Based on marketed spear colour**
- For white (blanched) spears production
- For green spears production
- For both white and green spears production

Ecological needs

- Broadly adapted cool season plant
- **Light:** needs at least 4 months light period after the harvest period
- **Temperature:** 16-24°C is optimal for growth; minimum temperature for spears growth is 10°C; above ground parts are killed by frost, while the crown overwinters; germination opt. is 25-30°C
- **Water:** (400)-600 mm during the growth period
- **Soil:** deep, well-drained light soils, the spears should emerge without damage; pH neutral or slightly alkaline soils; high tolerance to salinity
- **Nutrients:** high manure and nutrient requirements, P and K for good establishment, requires many Ca

Field production I

- **Crop rotation:** cultivated as a perennial → no rotation, occupies the field for 10-15 years
- **Tillage:** land preparation has crucial importance, raised-bed culture, the soil is mounded for white asparagus
- **Propagation:** direct seeding or transplanting rooted seedlings or transplanting crowns
- **direct seeding** – into 15-20 cm deep trenches
- **transplanting** – with 10-12 weeks old seedlings or 1-year-old crowns, at 15-20 cm depth into trenches, 20-50 cm apart
- row distance is 100 (green) – 200 (white) cm
- population is 15-25 (white) or 25-50 (green) thousand plants/ha

Field production II

- **Special cultural practice:** trenches are filled in
- **Fertilization:** N application during fern development
- **Irrigation:** surface-applied irrigation is preferred to overhead sprinkling
- **Weed control:** mechanical cultivation, herbicides
- **Mulching:** white on black for moderating soil T
- **Harvest:** first harvest is made (2-)3 years after seeding, harvested in the spring, the first harvest period is just 2-4 weeks, later it can be prolonged to 3-(5) months; picked by hand daily
- Sometimes machine harvest for processing
- After the harvest beds are levelled, and the ferns are allowed to grow for the rest of the season
- **Post harvest:** graded for length and diameter, storability max. for 2 weeks at 2°C and 95% rh