

Growth stages

Key points

- Vetch is an annual legume that produces a scrambling vine with moderate stem strength and multiple lateral branches that develop from near the base.
- The plant is thin stemmed, so it is initially semi-erect until its lengthy stems cause lodging before flowering.
- Germination is hypogeal, meaning the cotyledons of the germinating seed remain below the ground and inside the seed coat.
- Vetch roots are sensitive to saline, high boron and sodic soils.
- Flowering begins on the lowest branches, gradually moving up the plant and continuing until near maturity.
- Vetch has an indeterminate growth habit, meaning it is possible to find flowers, immature pods and mature pods on a plant all at the same time.



5.1 Introduction

Common vetch is a succulent, annual legume with long, smooth stems of moderate stem strength and tendrils that help it climb and increase the stem support. It grows as small bushes, some 40–80 cm high, with multiple lateral branches that develop from near the base. It is a large, climbing, semi-prostrate plant with 9–16 internodes and multiple green to dark green leaves.

The vetch plant experiences hypogeal emergence, like field pea (Figure 1), which means the cotyledons of the germinating seed remain below the ground and inside the seed coat.

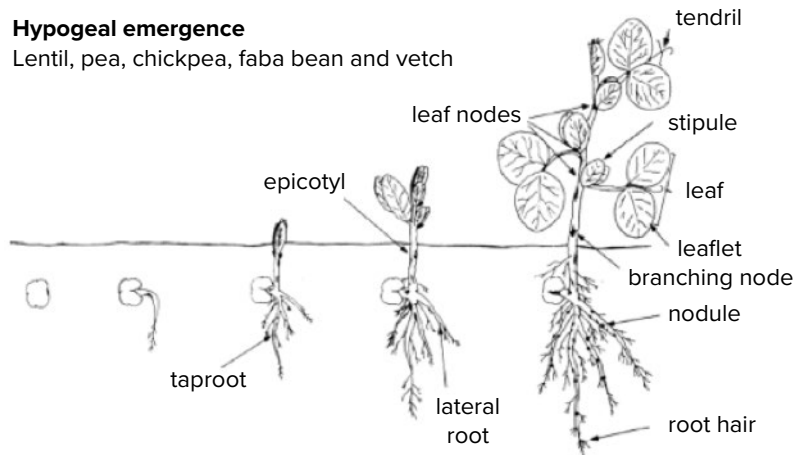


Figure 1: Seedling development of lentil.

Source: Best Management Guide –Lentil Production: Southern Region, (2015), Pulse Australia, <http://www.pulseaus.com.au/growing-pulses/bmp/lentil/southern-guide>

Seedlings with hypogeal emergence are less likely to be killed by frost, wind erosion or insect attack. This is because new stems can develop from buds at nodes at, or below, ground level. However, their growth may be slowed considerably if the initial shoot is damaged.

The **vetch plant** is a slender, initially erect plant that has thin stems and a trailing habit when in advanced growth stages. It is a bushy annual with compound leaves (4–8 pairs of leaflets), similar to lentil leaves, with a tendril at each tip. Plants can have single stems or many branches, depending upon the population in the paddock.

The many and lengthy stems of a vetch plant originate from near the ground. Plant stems normally range from 50–200 cm in length. Plants generally grow taller when there is adequate soil nutrition and moisture along with cool growing season temperatures.

Because of their relatively long stem lengths, vetch crops lodge mid-season due to their weak stems, particularly if well grown with high crop biomass and grain yields.

Flowering begins on the lowest branches, gradually moving up the plant and continuing until harvest. Flowers can be purple or white, and are self-pollinated.

Vetch plants flower profusely over an extended period and can set many pods, with each pod containing multiple seeds depending on the growing season conditions.

Pods and seeds. Due to its indeterminate growth habit it is possible to find flowers, immature pods and mature pods on a plant at the same time. This means that crop desiccation may be required as an aid to grain harvest in order to create more even maturity.

Seeds are small in comparison with pulses and are a characteristic round shape.

FEEDBACK

Growth stage

GS00–GS04



Development phase – Germination to emergence

In moist soil with temperatures above 5°C seeds germinate within a few days.

Root emerges then shoot with leaves initially pointing downwards. Cotyledons (embryonic leaves) remain below ground.

If not inhibited by subsoil constraints the tap root can reach to 1m.

Emergence occurs after 10 days in warm conditions (12°C) but can be delayed as long as 21 days if cold (5°C).

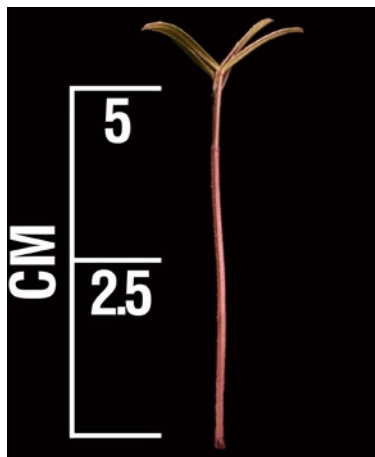


Key management

Sow into a weed-free seedbed. Roll prior to emergence. Apply PSPE herbicides before emergence.

Growth stage

GS101 first node first leaf fully unfolded with one pair leaflets.



Development phase – vegetative

A node is counted as developed when leaves are unfolded and flattened out.

FEEDBACK

The vegetative stage is determined by counting the number of developed nodes on the main stem, above ground level. Vegetative nodes are counted from the point at which the first true leaves are attached to the stem. The last node counted must have its leaves unfolded.



Key management

Monitor for establishment pests including RLEM and lucerne flea.

Growth stage

GS104 fourth leaf fully unfolded with more than one pair of leaflets, complex tendril.

GS1(N) N last recorded node.



Development phase – vegetative

Multiple lateral branches develop from near the base. No secondary branching. Stems range from 50-200 cm.

Vetch leaves are concave, green and hairy on both sides. Leaflets of Common vetch are broader and appear more succulent than those of woolly pod vetch.

Roots continue to extend and secondary roots branch.

Root nodules can start appearing as early as 15 days after emergence. These are generally on the tap and secondary roots near the surface.

Peak nodule growth coincides with peak vegetative growth.



Key management

Monitor for pests every 7–10 days if <15°C or every 3 days if 15–20°C

Control pests

Do not graze woolly pod vetch (RM4) before 10 nodes or 15 nodes

Do not graze lower than three nodes

Monitor for disease and control

Check nodulation and for nutrient deficiency

Waterlogging will limit nitrogen fixation by nodules.

Growth stage

GS201-203 Flowering



Development phase – reproductive

Reproductive phase commences as the plant begins to flower but biomass production can continue if soil moisture is available and temperature is below 30°C. Flowering can recommence if rain follows high temperatures.

Flowering in vetch is indeterminate, occurring from axillary buds on the main stem and branches. It proceeds from lower to higher nodes. Each flower produces a pod containing multiple seeds.

Flowers self-pollinate.

Nodulation starts to decline at flowering. Most nodules will be in the top 15 cm of soil.

Generally flowers between September and November.

FEEDBACK



Key management

- Monitor for disease—Ascochyta, Botrytis and rust.
- Apply fungicides before canopy closure.
- Check pesticide withholding periods for hay cutting.
- Cut for silage and hay before pod set.
- Peak biomass.

Growth stage

GS204-207 Pod set to pod fill



Development phase – reproductive

- As stems elongate plants start to lodge. Pods start to fill and the plants start to dry-off.
- Most pods form on the middle and lower nodes.
- Narrow pods about 20–50 mm long contain 3–8 seeds (variety specific).
- Root growth can continue until maturity.

Key management

Terminate manure crops – timing depends on motivation – weed control or biomass.

FEEDBACK

Growth stage

GS208-210 Green wrinkled pod to dry seed



Development phase – reproductive

Seeds ripen from late October.

Grain maturity is reached 180–250 days after sowing depending on variety.

Key management

Desiccate weeds and to advance harvest by 10 days.

Growth stage

GS301-303 lower pods dry, down to all pods dry.



Development phase – senescence

Vetch seeds are medium to large in size (6.5–8.9 g/100 seeds). The testa (seed coat) is of a brownish, dull grey or black in colour. Cotyledon colour varies with the variety.

Key management

Vetch is ready to harvest when more than 90% of pods lose green colour. Stems may still show some green. Seed in left pod is still too green, right pod is mature and ready for harvest.