

The Legumes

Handout for session 3.10

References: Davies and Lennartson Organic Vegetable Production pp53-55
Pullen Valuable vegetables, see under specific vegetable names

Legumes are important to vegetable growing in two distinct ways:

- Vegetable crops in their own right in the form of peas and beans
- Nitrogen building green manure crops

Crops for eating

Peas *Pisum sativum*

Available in three forms for each of which there are numerous varieties:

1. The traditional garden pea where the pod is not eaten. This is further divided into round seeded and wrinkled seeded varieties. Round seeded peas are hardier and therefore suited to early sowings but they are less sweet to eat owing to higher levels of starch. Quick to harvest but of course requiring processing in the kitchen.
2. Mangetout peas where the pod is eaten before the peas inside swell. Harvesting is therefore a highly labour intensive process.
3. Sugar-snap peas where the pod is eaten with the peas fully developed inside. Quick to harvest and in the kitchen.

The other highly important distinction between varieties is the height to which they grow. Taller varieties will give a much higher yield per metre square even though rows need to be further apart but are labour intensive in terms of the provision of support. Height attained will also depend on fertility and exposure so varieties that on a field scale grow to 2ft6" will often grow to 4ft in a garden and so need support.

Keep your peas carefully labelled as confusing the different types can lead to expensive mistakes.

Broad beans *Vicia faba*

Varieties are divided as with peas between over-wintering/early types and main crop types. There are a few dwarf varieties such as The Sutton which genuinely don't need any support. On a field scale even the tall varieties seem to support themselves much better than in gardens perhaps because of the larger block effect. In a garden you can imitate this effect by planting a bed in block fashion but it will still probably require a string running round the outside.

Harvest time is crucial, too early and customers will complain about the small yield after lots of podding, too late and they will complain about tough starchy beans. In this case you can at least encourage them to remove the outer skin of the bean after cooking.

Field beans, tic beans, fava beans are all varieties of this species which is not known in the wild. Production of dry beans would be very difficult in our climate. Broad beans are a superb source of protein at 20-25%, but many people find them difficult to digest.

French Bean *Phaseolus vulgaris* and **Runner Bean** *Phaseolus coccineus*

French beans and runner beans are both derived from the same tropical climbing bean from Central and South America. Because of their tropical origin they require warm soils which means early crops have to be under protection. Planting outdoors is not advisable before the beginning of June and early frosts can bring a premature end to the harvest.

The most important distinction here is between bush and climbing varieties. The other division is between round and flat pods. Climbing beans with flat pods are probably the highest yielders but round beans are normally thought to be better tasting and the flat beans tend to be confused with runner beans (see below) which normally attract lower prices I suspect partially as a result of the need to de-string runner beans in many cases.

Crop name	Botanical name	Types	Cultivation methods
Pea	Pisum sativum	Garden – Round seed	Over winter in tunnels Modules in February
		Garden - Wrinkled seed	Modules in March, outside in April and May
		Mangetout	as above
		Snap-pea	as above
Broad bean	Vicia faba	Over-wintering	Tunnel break crop sown October or outdoor sowing September/October with cloches over winter maybe
			Outdoor sowing from February
		Main crop	Outdoor sowing in March and April
French Bean	Phaseolus vulgaris	Dwarf bush	Modules in early April for tunnel crop Modules in late April for planting out
		Climbing - flat pod	as above
		- round pod	as above
Runner bean	Phaseolus coccineus	Climbing - flat pod	Modules in late April Outdoors in late May
		Pinched-out bush	As above

Fertility requirements

As a result of their nitrogen fixing ability legumes do not require high levels of nitrogen but are quite demanding of potassium and phosphorus which are both normally adequate in a good organic rotation. Lack of potassium makes broad beans susceptible to chocolate spot fungus. Most of the fixed nitrogen will be removed in the crop so legume crops will sustain rather than dramatically increase soil fertility.

Pests and Diseases

Legumes are not overly plagued by pests and diseases. The following list is in order of significance in my local experience

Disease/Pest	Most susceptible crop	Avoid by
Mice and voles	Seeds of peas	Sprout peas prior to sowing
Rooks	Seedling peas and beans	Cover with enviromesh or wire netting
Botrytis	On indoor climbing beans	Good ventilation and generous plant spacing
Pea Moth	All peas except mangetout	Compost crop residues straight after harvest
Chocolate Spot	Broad Beans	Adequate potash, generous spacing
Bean Rust	Broad beans	Generous plant spacing

Leguminous Green Manures

When a complete leguminous crop is turned it will substantially increase available nitrogen for the succeeding crop. The most important distinction to be made is the period of time which the green manure crop occupies a particular site. This could be anything from a few weeks in the case of a non leguminous green manure like mustard to four years in the case of a clover ley. The term green manure is normally restricted to ungrazed crops occupying land for a single season or less. The leguminous green manures are all relatively slow to establish and fixation over the winter is very slow especially in northern Scotland!

This leaves us with three practicable opportunities:

Opportunity	Cultivation	Suitable Species
1. One to two year fertility building break	Undersown in spring cereal Autumn sown Spring sown	Red clover, Crimson clover, possibly Lucerne in dry Eastern area if for two years Annual Lupin - Spring sown only
2. Over winter ground cover	Autumn sown	Vetch(tares) with oats or trefoil
3. Undersown fertility building ground cover	Summer sown usually under brassica	Trefoil

There is no point in sowing expensive leguminous seed if it doesn't have time to fully establish. When time is short a fertility maintaining non leguminous plant is likely to be far more efficient at conserving soil nitrogen.

Following on from this try to follow any over wintered green manure with a late sown crop because as spring gets going it will fix more nitrogen in a month than in the previous six months over the winter. The bulk of the crop is a good guide to nitrogen fixed.