

Fertilisation

The choice of form of fertiliser is important as the French bean cycle is short. The fertilisers used must contain elements that are taken up easily and quickly. The main elements (N, P, K) must be applied rationally, partly before the crop is sown (basal dressing) and the rest as top dressing during the vegetative cycle.

Single and complete fertilisers are applied in many production zones. Nitrogen fertiliser (N) is in urea, ammonia or nitric form, phosphorus (P) is applied as ammonium phosphate or triple superphosphate and the most common forms of potassium are potassium sulphate or ni-

trate. Chloride forms should be avoided as chlorine is toxic for many market garden crops and for French beans in particular. Shallow hoeing should be performed when top dressing is applied or fertilisation can be followed by watering. In some perimeters with more sophisticated installations, fertilisation—especially top dressing—can be combined with trickle irrigation.

In addition to the main elements, secondary elements are generally combined with the basal dressing; these are magnesium in the sulphate form and calcium in the form of slag. The trace elements essential for the crop (molybdenum, zinc, copper and manganese) are applied if necessary by foliar spraying or via the trickle irrigation system.

French bean — Fertilisation — Recommended quantities and fertilisation plan

	N	P	K
Recommended quantity per hectare	70-90 u	80-100 u	150-180 u
Basal dressing as % of recommended fertilisation	40-50 %	40-50 %	40-50 %
Top dressing (sowing + 15 days)	25-30 %	25-30 %	25-30 %
Top dressing (sowing + 25-30 days)	25-30 %	25-30 %	25-30 %

Irrigation

As for most counter-season crops in tropical countries and especially in the Sahel zone, it is essential to irrigate fields of French beans for a crop that is satisfactory in terms of both quality and quantity. In some highland zones (in Kenya), rainfall may cover part of the water requirements. Fields are traditionally watered by gravity irrigation. Some perimeters have installed more sophisticated techniques such as trickle irrigation and sprinkler irrigation.

Gravity irrigation

This type of irrigation requires good land levelling so that the water flows freely along the rows. Defects in levelling cause local accumulation of water with a risk of plants wilting as a result of root asphyxiation and the spread of certain fungal diseases. Very large amounts of water are required and the quantity is difficult to manage, especially during the rainy season when the total of irrigation water and precipitation may sometimes be excessive).

Trickle irrigation

Very well suited to this kind of crop,

trickle irrigation requires rigour, in particular as regards filter equipment as water with a particle load can foul irrigation piping. This method uses much less water than gravity irrigation and the management of quantity is more flexible and rational. In addition, the technique can be used to apply top dressing with the applications split and distributed throughout the cultivation period. Much care must be taken in the choice and quality of the fertilisers used for fertilisation and the risk of blocking of the drippers can affect the overall quality of irrigation of all the rows and the field.

Sprinkler irrigation

This technique also enables better management of volumes and application of water throughout the vegetative cycle. It is better to water in the morning to avoid risk of leaf burn and also to limit risk of fungal infection during sultry weather. Sprinklers with large jets or large drops should not be used as they can damage foliage and also splash the pods with earth and reduce the commercial yield of the field. This watering technique has the advantage of limiting the populations of certain pests—in particular spider mites and thrips.

French beans are sensitive to water stress, especially at the emergence stage and during flowering/pod growth. However, excessive irrigation should not be applied at the post-emergence stage in order to avoid fungal attacks at the root collar of seedlings. A slight, rational water shortage after emergence enhances plant rooting as the roots explore a deep level of the soil. Irrigation frequency and dose are determined in the light of meteorological conditions, taking daily evaporation into account in particular. Installing tensiometers in the field can be a help in taking decisions concerning irrigation depths and frequencies. Knowledge and experience of the soil and the crop should be taken into account in irrigation management. It is preferable to perform both furrow and sprinkler irrigation in the morning, allowing the foliage to dry during the day. Sprinkler irrigation should not be carried out immediately after leaf spraying with fungicide or insecticide. Irrigated just before picking should be avoided. Harvesting conditions will be more comfortable (no wet areas) and the produce of better quality (no risk of mud or wet earth on the pods).



French bean varieties

Varieties photos © Seminis

The French bean varieties used for export to the European Union market have changed little since the mid-1990s. About half a dozen are used for all the crops in African and Mediterranean producer countries. The Royal Sluis company, a member of the Seminis group, supplies most of the seed for this particularly delicate counter-season crop. Several other seed companies are breeding new varieties that may soon afford a broader choice for producers.

Different varietal type: Bobby, fine filet and very fine filet

The varieties 'Amy', 'Teresa' and 'Samantha' are grown for fine stringless filet ("needle") beans while 'Paulista' and 'Nerina' are used more for Bobby type fine beans. 'Nerina' seems to be approaching the end of its life and is being gradually replaced by 'Paulista'. The 'Julia' and 'Sagana' very fine filet varieties are grown for export to France and for canning (in Cameroon and South Africa). The geographical distribution of the varieties is fairly even according to producer country although certain varieties will be grown more or less according to the market segment pattern sought. Thus, Kenya and Burkina Faso concentrate more on filet beans. Morocco, Egypt and Senegal opt for a more varied use of the varieties available according to destination markets on which Bobby bean is predominant. The different varieties have more or less the same production characteristics and differ in pod shape and length or have a more or less marked green colour (under the same production conditions). The very widespread 'Amy' variety seems to be more susceptible to rust, one of the main diseases of French bean.



Paulista

Bobby type

Size: 30% width 6 to 8 mm, 60% from 8 to 9 mm
Colour: brilliant dark green

'Paulista' is the best Bobby bean variety. It gives a stable yield and its quality is much requested for export. It also has high tolerance to transport. It is grown in Senegal, Gambia, Morocco, Ethiopia, Egypt, Kenya and South Africa (for the domestic market).

Samantha

Filet type

Length: 12 to 13 cm straight pod

'Samantha' is a vigorous variety thanks to its powerful root system and adapts well to stress. It has a very high yield potential. It is grown in Kenya and Burkina Faso.



Teresa

Filet type

Length: 13 to 14 cm pod
Colour: dark green
Resistance: rust, anthracnose and common mosaic

'Teresa' is the leading rust-resistant filet variety, making it important in a producer country like Kenya where this disease can cause serious problems. Kenya exports its entire production to the United Kingdom.

Amy

Filet type

Size: 70% smaller than 8 mm
Long, straight pods

'Amy' is a vigorous variety with staggered flowering. It has excellent storage qualities after harvesting and packing. It is also a reference in manual picking. It is grown in Kenya, Senegal, Burkina Faso, Zambia and Zimbabwe. Most of the production of 'Amy' is shipped to France.

