

Sunflower (*Helianthus annuus L.*)

French: Tournesol; Spanish: Girasol; Italian: Girasole; German: Sonnenblume

Crop data:

Annual species, member of the Compositae. Main stages of plant development:

- Emergence.
- Leaf development, from 1 to 25-30 leaves.
- Bud initiation progresses from the 8-10 leaves stage until the buds reach 15 mm diameter, when the potential number of seeds is determined.
- Flowering, 60-70 days after emergence. The period of seed setting is critical for the first yield component, the final number of seeds.
- Maturity, the period of oil accumulation, which is critical for the second yield component, the 1000-seed weight, and when the leaves should be kept alive.

Sowing, March-April; harvest, September-October (Northern hemisphere). Commercial growing cycle 120-160 days. Quick-maturing cultivars are available for Northern France.

Sunflower seeds (kernels) have become a major source of oil (about 50 % of the dry weight), and of meal. The quality of the meal can be improved by dehulling before crushing, thus decreasing the crude fibre content.

Hitherto, sunflowers were grown on light and shallow soils but, with increasing prices, they can now be found on better soils. Yields are potentially up to about 5 1/2 to 6 t/ha but, due to diseases, water stress, etc., average around 3 t/ha. Under dry conditions a minimum of about 2 t/ha can be expected.

Nutrient demand/uptake/removal

Nutrient uptake/removal - Primary and secondary nutrients					
For yield of 3.5 t/ha	kg/ha				
	N	P ₂ O ₅	K ₂ O*	MgO	CaO
Uptake	131	87	385	70	210
Removal	66	54	82	14	10
Residues	65	33	303	56	200

* Note the high potassium uptake.

Nutrient uptake/removal - Micronutrients					
For yield of 3.5 t/ha	g/ha				
	Fe	Cu	Zn	Mn	B*
Uptake	732	59	348	412	396
Removal	106	25	148	42	80
Residues	626	34	200	370	316

* Among the micronutrients, boron is one of the most critical.

Plant analysis

Plant analysis data - Optimum concentration/Macronutrients								
Source	Sampled leaf	Sampling time	% of dry matter					
			N	P	K	Mg	Ca	S
CETIOM	5th and 6 th leaves under the head	F1-Flowering	3.08	0.37	3.91	0.32	2.18	-
Literature	"	"	3.0-5.0	0.3-0.5	3.0-4.5	0.3-0.8	0.8-2.0	0.15-0.2

Plant analysis data - Optimum concentration/Micronutrients							
Source	Sampled leaf	Sampling time	ppm dry matter				
			Fe	Cu	Zn	Mn	B
CETIOM	5th and 6 th leaves under the head	F1-Flowering	107	12.5	45.8	44.8	62.3
Literature	"	"	80-120	10-20	30-80	25-100	35-100

Fertilizer recommendations

50-80 kg/ha N applied before sowing (about 60-70 percent of N-uptake comes from the soil and subsoil; the rooting system can go down to 2 m depth). Too much N increases the risk of disease and lodging, with a consequent reduction in oil content.

Also at sowing, on rich soils, 60-80 kg/ha P₂O₅ and 100-120 kg/ha K₂O. Or, on poor soils, 100-150 kg/ha P₂O₅ and 150-300 kg/ha K₂O.

Special attention must be paid to boron nutrition: sunflower is very sensitive to boron deficiency on calcareous or sandy soils and in regions with demanding climate. Boron application may be made either at sowing time (1.2 kg/ha B), applied on the soil, or at the 10-leaves stage, as a foliar application of 500 g/ha B (0.1 % B solution).

Further reading

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