Hemp *(Cannabis sativa L.)*

French: Chanvre; Spanish: Canamo; Italian: Canapa; German: Hanf

Crop data

Annual, herbaceous at start, becoming ligneous later.

Harvested part: stalk, for fibre (fibres develop between the primary bark and the cambium, while the inner part of the stalk is ligneous with a hollow centre).

Sown late March to early May, depending on region.

Sowing rate 250-450 viable seeds/m2 for fibre or 10-20 plants/m2 for seed production.

Vegetation period 115-125 days for fibre, 140-150 days for seed. Genetic yield potential of currently grown varieties 12-15 t/ha of dry above-ground portion, over 3t/ha fibre.

Prefers fertile soils, e.g. various kinds of chernozems in USSR and S. Europe.

Largest producers are USSR, India, China and some countries in central and southern Europe.

Nutrient demand/uptake/removal

Uptake by total above-ground portion at technological maturity

Nutrient uptake - Macronutrients						
Yield t/ha	**Source**	**kg/ha**				
		N	**P2O5**	**K20**	**MgO**	**CaO**
6.0	Bredemann, 1945	111	36	124	22	108
7.1	Jakobey, 1970	81	38	143	-	-
11.3	Ritz, 1972	109	64	118	-	-

Nutrient uptake is most intensive before and during flowering, when growth is complete.

Plant analysis data

Average composition of above-ground parts at technological maturity

Plant analysis data - Macronutrients						
Plant part	**% of dry matter**					
	N	**P**	**K**	**Mg**	**Ca**	**S**
Leaf	2.40	0.42	1.77	0.59	0.81	0.45
Bark	0.57	0.22	1.06	0.30	0.32	0.35
Stem	0.52	0.13	1.06	0.12	0.32	0.36
Total above-ground	1.13	0.22	1.17	0.27	0.47	0.39
Source: Starcevic, 1979						

Other authors have obtained comparable figures within the range 1.0-2.9 % N, 0.22 - 0.75 % P, 0.83-2.74 % K.

Fertilizer recommendations

The recommended rates of nutrients are 60-150 kg/ha N, 40-110 kg/ha P2O5, and 40-110 kg/ha K2O.

The plants take up nutrients more rapidly and grow better if a high concentration of nutrients is provided early in the season.

Timing of application

Level of application	Autumn - kg/ha			Spring - kg/ha		
	N	P2O5	K2O	N	P2O5	K2O
Low	-	45-60	45-60	45-60	-	-
Medium	40-60	60-90	60-90	40-60	-	-
High	50-60	60-90	60-90	70-90	20-30	20-30

At low rates, total N is applied before sowing; at medium rates, one half of N is applied in autumn and the other half before sowing; at high rates, 50-60 kg/ha N are applied in autumn, 50-60 kg/ha N before sowing and 20-30 kg/ha N are topdressed at the stage of three pairs of leaves.

N is applied in autumn in regions with moderate autumn and winter rainfall, on soils with a deep water-table, and when crop residues with an unsatisfactory C:N ratio have been ploughed under.

Preferred nutrient forms

Autumn N in ammonium and/or amide form, usually as complex NPK fertilizer or urea: spring N as calcium ammonium nitrate.

Rate and form of P depend on soil available P and pH. Watersoluble form is preferred.

K as KCl or K2SO4 , with a slight preference for the latter.

Present fertilizer use

Soil fertility (producing region)	Rates of application - kg/ha		
	N	P2O5	K2O
Fertile chernozem (USSR)	45- 60	45- 60	45- 60
Medium fertile chernozem (USSR, Southern Europe)	80-120	60- 90	60- 90
Less fertile soils (Central & SE Europe)	120-150	90-110	90-110

Further reading

BREDEMANN, G.: Untersuchungen ueber die Naehrstoffaufnahme und den Naehrstoffbedarf des Hanfes. Bodenkunde und Pflanzenernaehrung 36, 167-204, Germany (1945)

RITZ, J.: Absorption of nutrients (NPK) in hemp (in Serbo-Croat, with summary in English). Agricultural Research Review 28,117-126, Zagreb, Yugoslavia (1972)

STARCEVIC, Lj.: A study of relations between some anions and cations (N, S, P, K, Ca and Mg) and their effect on yield, fiber quality and content in different parts of hemp plant (in Serbo-Croat, with

summary in English). Proceedings of Natural Sciences of Matica Srpska 57, 109-172, Matica Srpska, Novi Sad, Yugoslavia (1979)

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