

**Crop Description**

The FINOLA variety of industrial hemp (non-drug *Cannabis sativa* L.) is a versatile, dioecious, oilseed crop that was developed in Finland. It is primarily grown for grain and also produces fiber/biomass, which can be chopped and left to decompose in the field. Cultivated like other industrial oilseed crops. The typical seed weight for FINOLA is between 12- 15 grams /1000 seeds, with smaller seed in the northern latitudes (> 50° N) and larger seed in the south (< 50° N). Average potential grain yields also vary with latitude; up to 1000 kg/ha near 60° N and 2000 kg/ha near 50° N, under good conditions. Continental climates are preferred.

**FINOLA seed and meal** are excellent sources of oil and vegetable protein for human foods and animal feed. It has none of the anti-nutritional agents found in rapeseed (glycosinolates), soya (protease inhibitors) and linseed (cyanogenic glucosides). Hens will produce *omega-3* eggs when feed the seed or meal.

**Field Selection:** Sow FINOLA in well-drained soils that are rich in organic matter with high nutrient availability. Clay, heavy, compacted soils and low, wet areas should be avoided. High microbiological activity in the soil will support vigorous growth through mycorrhizal symbioses under organic cultivation. A light to medium textured soil is preferable, near pH 6-7. FINOLA is best preceded by perennial alfalfa/grass breaking crops, green manure plow downs, legumes, potatoes, or soybeans. Corn, other oilseeds crops, oats, rye and wheat can be vectors for disease and are not recommended as fore crops. Spice crops, such as cumin and caraway are also not recommended as fore crops, as they can impart unwanted flavors into hempseed oil. This may not be a concern if the grain is used in animal feed.

**Weed Management:** Given a good start, FINOLA can be an effective weed suppressant. A quick, even emergence is the key to effectively compete with weeds, by rapidly creating a dense leaf canopy within the first month of growth. Farmers are recommended to minimize weed pressure in the Autumn, if possible, and (at least) with Spring tilling and harrowing. Perennial forages or green manure plow downs are good fore crops. Problem weeds include black bindweed or wild buckwheat (*Fallopia convolvulus*), wild oat (*Avena fatua*), pigweed (*Amaranthus* species), fat hen (*Chenopodium album*) rapeseed, caraway, coriander and other volunteer crops. *Fallopia convolvulus* seed is especially difficult to clean away from small hempseed.

**Seeding:** The seedbed must be raked uniform and evenly and uniform; sow or drill 1cm deep in moist, weed free soil. Most failures can be explained by deep sowing (>2cm), especially in poorly suited soils. Roll if heavy rains are expected after sowing. Soil should be moist and at least +10 to 15° C, with late May as an optimum-sowing window near 50°N, and mid May near 60°N. Expect germination in 2 to 4 days, and emergence within 4 to 7 days, depending on soil moisture and temperature. An optimal plant density of 100 plants / m<sup>2</sup> should be achieved for grain production with about 30 kg/Ha. Hemp seedlings are frost tolerant to about -4° C. Prolonged cold at this stage is detrimental, but not fatal. A bushel of hempseed weights about 46 lbs (about 600 grams/Liter).

**Fertilization:** Under good conditions, FINOLA will grow vigorously and requires amounts of moderate nutrients. Fertilize like Rapeseed (Canola- *Brassica napus*) with 10-20% additional N. Conventional NPKS (nitrogen, phosphorous, potassium and sulfur) fertilization is recommended for FINOLA at the same levels required to grow rapeseed (Canola- *Brassica napus*), for example NPK (23-3-6) at 295-330 kg/ha, with an additional 10-20% N as urea or animal urine. Apply additional K and S wherever soils are deficient in these elements. FINOLA will grow somewhat taller and produce more biomass with increased fertilization, especially at higher latitudes. Increasing fertilization may also delay seed maturation, which is a concern at high latitudes with short growing seasons. For environmental reasons, very high amounts of N are not recommended. Amounts up to 150 kg N/Ha may cause the crop to exceed 2 meters in height at some latitudes. Otherwise, FINOLA is typically less than 2 meters.

**Organic producers** are recommended to precede a FINOLA crop with a perennial breaking crop, clover or green manure plow down, with added urine or manure to increase nutrient availability for rapid initial growth. Reduce any weed pressure by plowing and harrowing prior to sowing. The seedbed must be as fine and even as possible. **Note!** Good soil, farming experience and proper nutrient levels are essential for successful organic oilseed hemp production. Be sure to have enough nitrogen (N)!

### **Disease and Pest Management**

Hemp has very few disease and pest problems in most places. Under wet Autumn conditions, *Sclerotinia sclerotiorum* (stem rot) and *Botrytis cinera* (gray mold/ bud blight), may be a problem. Early harvest is recommended to avoid fungal damage. Grasshoppers, gophers, the Bertha Army Worm, the Hemp Borer and Lygus plant bugs have been known to attack hemp in some places. Note; there are no pesticides or herbicides that are registered for oilseed hemp in the EU. Pesticides and herbicides should not ever be used on FINOLA grain crops. Flocking migratory birds will be attracted to the mature seed in late Autumn. Ideally, hempseed should be harvested just before birds begin to visit the field.

### **Sampling the field for THC**

FINOLA is a rapidly maturing, auto-flowering variety of hemp, which requires some vigilance to recognize the correct sampling time. The beginning of flowering is typically 30-35 days after sowing, when male flowers begin to shed pollen. The end of flowering for FINOLA is no later than 55 days after sowing under normal conditions, and even sooner under stressful conditions caused by drought or competition with weeds. According to the sampling methodology A, described in Annex I of EU Regulation No 796/2004, the earliest sampling interval begins 10 days after the onset of flowering, which is 40-45 days after sowing FINOLA, and continues until 60-65 days after sowing. The latest possible sampling interval (method B) begins 10 days after the end of flowering (55-65 days after sowing), and may only continue during the next 10 days. The head spins... In practical terms, sampling may normally begin 55 days after sowing, and the latest possible sampling time can be no later than 75 days after sowing. Sampling times will begin earlier when the crop is under stress, and especially under hot and dry conditions. Late field samples may result in THC levels over 0.2%. Click [here](#) to download a 2.6 MB pdf that has specific information on, and pictures of FINOLA's morphology and development. If this link does not work for you, please visit the Finola home page, where it is posted near the top with other useful farming information: <http://www.finola.fi/>

## **Harvest**

Approximately 100-130 days after sowing, depending on latitude, FINOLA may be combined for grain while the crop is still “green” (70-90% grain maturity), in order to minimize fiber strength and fiber wrapping problems during harvest. This should be done when both the crop and the weather are relatively dry. An early harvest of good quality grain may be possible after 100 days near 50°N and 120 days near 60°N. Harvest should begin soon after birds are noticed in the field. Early harvest is recommended if wet conditions are expected. Drying facilities must be nearby and ready to receive the harvested grain, especially in wet climates. FINOLA can be swathed at 85% seed head maturity in a warm continental environment, such as Canada or Central Europe, and possibly in the UK, by cutting near to the ground and combining at ~10% seed moisture. Preferably, FINOLA can also be straight combined at about 12 to 15% seed moisture during dry autumn days with a combine (grain harvester), without modification, by cutting only the top third of the plant. Aerate grain immediately off the combine down to about 9% moisture – this is critical to prevent seed heating, reduce mold growth and to preserve seed quality. Ideally, chop remaining stalk and leave in field to decompose. Alternatively, cut or hay-bind the remaining stalk (ranging between 1- 1.5 meters in height) after drying a few days and bale. In northern climates, leave the stalk standing to snow rot the fibers, and collect stalks after most of the snow has melted, but while the field is still frozen. Reduce cylinder, rotor and unloading auger speeds to prevent seed damage while harvesting. Watch for fiber wrapping around shafts, particularly the drive shaft and sprockets of the feeder chain, or front beater, and front drum for the feeder chain. While grain producers use all types of harvesters, CIH rotaries, JD & NH conventional combines with draper headers seem to work best. There are some combine modifications that may limit fiber wrapping and speed up harvesting. Modest ground speeds and input rates, with high engine speeds should help to limit potential problems. As always, careful attention by an experienced operator is the best way to prevent mechanical problems. Caution: wrapped fibers can burn!

## **Drying and Cleaning**

Ideally, drying should begin in the field, either by swathing in climates that allow for it. In wet climates, transfer combined grain into a ventilated trailer bed that can begin to dry the grain while still in the field. For the highest quality, SLOWLY dry hempseed down to 9% moisture in a grain dryer, immediately after harvest, at LOW temperatures (20°-25° C max) and HIGH volumes of airflow, for 10-14 days. Faster drying temperatures can be used for lower quality grain; like for paint or animal feed. Moisture should be checked with a calibrated meter. Rapeseed moisture calibrations may overestimate oilseed hemp moisture by about 3%. FINOLA grain can be effectively cleaned with the following sieve sizes; 1.60- 3.25 mm oblong and 2.50- 5.00 mm round. A gravity table may be necessary to remove some weeds seeds.

## **Storage**

Do not store the grain for any amount of time without sufficient drying! Mold problems can ruin a harvest within a few hours, in some cases. Be sure that your drying facility is near by and available at harvest time, and be sure that your moisture meter is pre-calibrated for oilseed hemp! Store dried grain in bins or tote bags, away from birds. Hempseed should keep well for 2-3 years, if properly dried and stored.

**Thank you for your interest in Finola! Dr. Jace Callaway, CEO**

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