

How to grow Sunn Hemp

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Sunn Hemp is *Crotalaria juncea*, one of the fastest growing legumes known. Saia oats (black oats) and Sunn Hemp are the two main cover crops grown around the world, and for good reason.

Sunn Hemp is called this because of its bright yellow flowers and that it can be a source of fibre (hemp). It is an erect, branching, annual summer legume. It is a rapid, vigorous grower with a strong taproot and branching root system. It reaches a height of over 1.2m in 60 days when grown under favourable conditions (hot and wet). It can attain a height of over 1.8m in approximately 90 days. Plants are usually unbranched from the ground to 2 ft (60 cm) and many branches develop above this height. It does not self-seed easily and is therefore a low weed risk.

Sunn Hemp is drought hardy, fast growing, a huge producer of nitrogen, not fussy with soil types, diseases, water, nutrition etc..., and it kills/reduces CCN (Cereal Cyst nematode), RLN (Root Lesion Nematodes), rhizoctonia and take-all.

There are various "selections" of Sunn Hemp around the world based on its use as a source of hemp fibre or as a green manure (cover) crop.

For Australia, the main use is as a cover crop or green manure crop. The best known selection for this purpose is from Brazil and Paraguay, but unfortunately it is not able to meet Australian quarantine rules (it frequently contains banned seeds and the suppliers will not use herbicides or roguing to remove them before bagging), and therefore is not being imported.

Seed from Asia (India and China mainly) also fail to meet Australian quarantine rules (because of other species in the seed) and are therefore not imported either. Those varieties are also smaller and woody having a longer history of only using Sunn Hemp for fibre instead of leafy biomass. These types are not the ones we need for use as a cover or green manure crop - we need leafy biomass not woody biomass.

There is a variety from Hawaii called Tropic Sun that can be imported in small quantities (<http://www.molokaiseedcompany.com/products/tropic-sun-sunn-hemp.html>). It is not known if this variety is as vigorous and leafy as the Brazilian and African varieties but it looks to be similar. You will need to go through Australian Quarantine to import it and make sure you are not importing anything that should not be imported, like an exotic weed or insect.

At the time of writing, container loads of seed are also being imported in early 2015 from Kenya by me (Wayne Smith - wsmith@agronomy.com.au) in an attempt to have some affordable seed in the country. This variety is thought to have originated from Brazil and it does appear to grow and look like it. Most importantly, the grower is willing and able to meet all Australian quarantine requirements.

If you are interested in purchasing Sunn Hemp seed in Australia, email me for a list of the closest agent to you. I am not selling seed directly as that is not my core business, however, I can answer any agronomic questions you have on how to grow Sunn Hemp.

If you a reseller and want to sell the seed to others, please contact me. The seed is in 25kg bags in one tonne lots.

Producing seed in Australia

Sunn Hemp is not a weed because it sets very low levels of seed, and it has no hard-seededness (ie. no dormancy).

It will only produce seed in tropical to sub-tropical areas because it must have warm nights, preferably over 25C for maximum seed



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production. Therefore unless you are in areas like this, you will not be able to produce enough seed to be worth harvesting. You will only be able to grow it as a green manure cover crop.

Even in Brazil and Paraguay, harvested seed yields are often only 400-900kg/ha, but occasionally do obtain yields over 2t/ha. That is rare though. In the tropical areas of Australia, it is too wet to drive on the paddocks in summer to be able to grow and harvest it. Therefore it has been grown very successfully in the drier winter time, however, the nights are too cool to produce enough seed to be worth harvesting :-).

However, if someone in Australia can bulk up Sunn Hemp, please let me know because it would be preferable than having to bring it in from overseas. We would all like to purchase seed off you if you can produce it cheaper than it can be imported.

Growing Sunn Hemp

Seed rate: For seed production attempts, 3-5kg/ha. For cover crop purposes, 5-10kg/ha. Use higher seed rates in cooler climates as it will not branch as much. Sow with no-till and press-wheels.



Seed depth: 2-5cm depth is adequate with 2-3cm being the most ideal. However, it is a strong germinator and will come up from below 5cm depth if you need to place it deeper onto moisture.

Row spacing: 30cm-1m rows. For anyone trying to bulk up seed, sow on the 1m row spacings. In hot conditions with reasonable moisture levels, at 1m row spacings it will soon cover the inter-row space with its branches. Overseas trials showed best yields occur at low seed rates and wide row spacings, making the plants branch more.

Inoculation: Growers from Brazil and Paraguay say it does not need it, but in Australia it does. It "must" be inoculated with rhizobia for a successful crop otherwise it will not nodulate and will not thrive. Americans suggest using the EL (cowpea) inoculum, but in Australia there was a specific strain of rhizobium to use - Group M. You can obtain this by ordering it through your normal farm merchandise suppliers. Seed should be inoculated and sown immediately.

Seed pickles: Sometimes Sunn Hemp has suffered from pythium fungi in Australia. There is no registration for any products at the moment on Sunn Hemp, but 1L of Apron XL (350g/L metalaxyl) per tonne of seed works very well. If you are allowed to use that product, it needs to be applied at least 1 day before inoculating the seed with rhizobium. If there is a risk of early insect problems, adding fipronil and/or imidacloprid type insecticides to the seed is useful. As an example, 1L/tonne of Cosmos (500g/L fipronil) + 3L/tonne Gaucho (600g/L imidacloprid).

When to sow: There are no hard and fast measurements yet of what temperature it needs to germinate. Experience has shown that it has germinated quickly when average soil temperatures were 14C. However, once it emerged, it did not grow very much until the weather warmed up. It loves hot weather (30-40C days). Measuring the soil temperature at 9am at 3-5cm depth gives a close approximation to the average soil temperature for the day. It is best to sow when the temperature is on a rising trend. In southern Australia, the best sowing times will be August-December depending on where you are, but any time in summer will be fine as long as there is moisture to germinate it. In northern Australia, you will be able to grow it at any time of the year.

Soil types & pH: This is a robust species. It will grow happily from 5.0-8.5pH (in CaCl₂) and on any soil type. Down as low as pH 4.5 should be OK. If anything, American experience has shown it does not like the very high pH (alkaline) soils as much as it does the acidic soils.

Fertilisers: Sunn Hemp is not fussy with nutrition as it grows well on low fertility soils. However, until you gain a few years experience growing it, apply ~10-20kg/P/ha with the seed and 5-10kg S/ha if needed. If potassium is marginal, add 50-80kg muriate of potash before sowing (top-dressed or drilled away from the seed). If the soil is fertile, you should not need any fertiliser.

Herbicides: This has been the hardest to find information on because no one usually needs to use a herbicide.

Common replies have been that it smothers all the weeds – except at low seed rates. I have found some information and have made some educated guesses to make the following suggestions.

Herbicides that should be safe pre-sowing. Sakura (pyroxasulfone), Terbyne (terbuthylazine), Raptor (Imazamox), Spinnaker (Imazethypyr), Dual (Metolachlor), Treflan (trifluralin), Stomp (pendimethalin) and propyzamide.

May not be safe at high rates pre-sowing but are worth trying – Diuron, Simazine, Atrazine, Bladex (cyanazine), metribuzin.

Should be safe post-emergent - All grass selective herbicides normally used in broadleaf crops.

Will not be safe post-emergent – Glyphosate, Sprayseed, Reglone, Gramoxone, 2,4-D's, MCPA's, Lontrel (clopyralid), SU's and dicamba.

Pests: It is quite tolerate to many pests because it out grows them, except soon after emergence in cool conditions. Every bug under the sun seems to like it until the true leaves appear. Not many insects seem to like the true leaves. Applying 1L Cosmos (500g/L Fipronil) per tonne of seed will help on some hard shelled insects and locusts, but before sowing, use something in the knockdown herbicide like 200ml Chlorpyrifos (500g/L) + 75ml Cypermethrin (200g/L) to clear the deck before the seed emerges. If Bryobia mites are a problem, use 150ml Lemat (290g/L omethoate) instead of Chlorpyrifos. However, it is a successful cover crop around the world because it does not suffer many serious diseases or pests. Plan A should be to not spray any insecticides but use them on the seed so that the “good” bugs are not killed.

Harvesting: This is all I could find about header settings – *“Initially set the concave clearance at 1/8 to 3/16 inches and the cylinder speed at 1150 to 1200 RPM. Adjust as needed according to crop conditions.”* However, the chances of harvesting seed in southern Australia are very remote.

When the pods rattle, the seed is ready to harvest. It can be desiccated with glyphosate or paraquat/diquat if needed, but it should dry down on its own.

Planted by mid-October, I expect it to be harvested by late February/early March (later if it has been a cool summer).

As a cover crop: Maximum nitrogen production occurs by or just before flowering (~40-50 days from sowing in hot weather). No one in other countries lets it go much past this point before killing it as the stems become too fibrous. Average nitrogen concentration is ~5% when young, but falls back to about 1.75% at flowering. Many crops around the world have produced >150kgN/ha from 10t/ha biomass, so it is a very valuable input of nitrogen to the soil, as well as organic matter.



Effects on Livestock: Seeds, stems and leaves of Sunn Hemp are non-toxic in laboratory tests and feeding trials. Livestock may initially find it unpalatable but should not suffer health problems. As always though, be cautious and do not put hungry stock into it. There are many cases around the world where cattle and goats perform very well when grazing it.

What I see the main use should be: I see the main role of Sunn Hemp as a short lived cover crop to put nitrogen into the soil, reduce nematode problems, cover the soil and add the all important “diversity”. After you have harvested a winter crop, if the ground is wet or rain is imminent, sow the Sunn Hemp and allow it to grow until it is about waist high, then spray it out with glyphosate (and any other herbicides as needed depending on what weeds are present).

Because it is a cover crop, rarely should you add a herbicide to control weeds. They are going to be sprayed out anyway. Only if weeds are going to out compete the Sunn Hemp or you want to try and grow it to harvest should you use a herbicide.

Planting it after canola, a *Pratylenchus neglectus* nematode promoter, is an ideal place to sow it before sowing to a cereal crop in the winter. Sowing in front of any cereal crop is a good option because it will quickly add free nitrogen for the cereal crop to use.

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In wet areas that frequently have slug problems, Sunn Hemp is a very good option to grow over the summer to suck the soil dry to make the environment harder for the slugs to survive (they don't survive in dry soil), and add diversity and nitrogen while maintaining soil cover.

For organic and vegetable growers, it is a very useful species because it not only adds nitrogen to the soil, but there is something good in its roots that reduces many nematode problems.



Sunn Hemp growing in Kenya

I wish you all the best in growing this amazing species.

Regards,

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