

Cotton Australia fact sheet

Hemp

Opponents of cotton often ask: ‘why is hemp not grown in Australia, instead of cotton?’

What is hemp?

- Fibre hemp (*Cannabis sativa* L), saw its greatest demand in the 16th – 19th centuries during the times of sail for the production of ropes and sail material and a lesser extent clothing and building products.
- There are broadly two types of hemp plant, one for grain (shorter with bigger flowering heads) and one for fibre (very tall with thick stems).
- To date, Australian and Canadian production is focussing mainly on growing hemp grain, with a good grain yield being 1 t/ha.
- It is fibre hemp which opponents of cotton say should be grown in Australia.
- Industrial hemp (*C. sativa*) is a fast growing, annual herbaceous plant with a deep tap root that can grow to a height of 5 metres.
- There are limited hemp varieties suited to growing in areas where cotton is currently grown in Australia. However, there are new varieties being developed for both fibre and grain production.
- The stem is made up of two components, the bark or ‘bast’, which contains the fibres used for textiles, and the ‘hurd’, with much shorter fibres, used in mulch products. The bast represents approximately one third of the stem, the core about two thirds.
 - The value is dependent on the variety being grown, the age of the plant and the position along the stem, as well as the growing conditions.
 - Therefore, the majority of the plant possibly would not continue through the value chain due to associated movement costs from production areas to markets or processing facilities.
- Industrial hemp can only be grown in Australia under a licence issued by state governments. This licence is required by growers wishing to grow industrial hemp and/or produce fibre or seed/grain.

What are hemp’s agronomic characteristics?

- Industrial hemp plants grow well on a fertile, neutral to slightly alkaline, well drained clay loam or silt loam soil types.
 - The only similarity here to where cotton is currently produced in Australia, is the requirement for slightly alkaline soils.
 - Cotton is grown on heavy black cracking vertosol soils that have high clay content and high water holding capacities.

- This would potentially lead to waterlogging issues for Industrial hemp species as they are intolerant to wet, flooded, or waterlogged soils.
- Water management is particularly important during the first six to eight weeks of hemp crop establishment.
- Without significant supplementary rainfall, Industrial hemp requires between 3–6 ML¹ (regionally and soil type dependent) of irrigation water per hectare for sustainable production rates (source: NSW DPI). Cotton requires 6-7ML/ha².
 - Leading CSIRO scientists agree that water and Nitrogen requirements for industrial hemp are similar to those of cotton.
 - Current varieties (like most crops) are intolerant of inadequate moisture this creates a production situation that is finely balanced. Without supplementary water, this reduces the areas where Industrial hemp can be currently grown in Australia.
- Industrial hemp varieties require soil temperatures for germination around 18°C with optimum temperatures for growth between 15–27°C.
- Industrial hemp is intolerant of frost and excessively cold or hot climatic conditions, which narrows the regions in Australia where the crop could be grown.
- Very humid conditions give rise to fungal diseases which would need chemical control measures where there are currently not many registered products available.
- Due to the above mentioned conditions required for growing sustainable fibre hemp crops, it could not replace cotton in most areas of Queensland and NSW where cotton production currently takes place.

Is hemp a viable alternative to cotton?

- In Australia, there is a potential market for:
 - Hemp stems (partially refined fibre) to be used in the industrial non-woven market, for example, for weed mat and erosion control fabrics
 - Hurd (the balsa-like central part of the stem), which can be used in building products and which currently commands a price of approximately \$1000/tonne in Australia.
- Both these markets require critical volumes in order to supply processing plants and markets.
- There are currently no processing plants or infrastructure in NSW or QLD to deal with the primary processing of industrial hemp.
- The cost of transporting plant material more than 100 kilometres makes production unviable.

¹ Agrifutures Australia 'Industrial Hemp' 24.05.17 <https://www.agrifutures.com.au/farm-diversity/industrial-hemp/>

² Roth Guy, Harris Graham, Gillies Malcolm, Montgomery Janelle, Wigginton David (2013) Water-use efficiency and productivity trends in Australian irrigated cotton: a review. Crop and Pasture Science 64, 1033-1048.

- When a farmer considers growing any crop they ask themselves whether it is sustainable for their business to produce the crop, including:
 - What markets are available for industrial hemp material?
 - Is the profit margin equal to or higher than other crops?
 - How will the crop be harvested?
 - What processing facilities are available?
- The total planted hemp crop planted in Australia last year was approximately 2,500 hectares.
 - The fibre yield from grain stems (in Australia) ranges between 12-20% of the straw dry mass – therefore, approximately 1 tonne/ha of unrefined fibre could be realized from grain crops.
 - Refining, to make the fibre useful for textile processing, will take away another sizeable percentage of this yield. The refined fibre yield could be as low as 500 kg/ha.
 - The market for refined hemp fibre is very small, 60,000 tonnes/year.
- The price for unrefined hemp fibre (off the farm) is much less than the price/kg for ginned cotton lint.
- Therefore, at the farm gate, the hemp textile fibre proposition is quite poor – unless there is processing operations and concentration (of product) at or near the farm.
- Many questions that can't be adequately answered in a positive manner remain unanswered to make fibre hemp the crop of choice to displace cotton in most production areas across Australia.
- Cotton Australia does not, and doesn't want to discourage hemp production in Australia, and we wish the industry well.
- For more information, visit:
 - <https://www.agrifutures.com.au/farm-diversity/industrial-hemp/>
 - https://www.dpi.nsw.gov.au/data/assets/pdf_file/0020/232823/industrial-hemp-a-new-crop-for-nsw.pdf.pdf