

Supplemental Data

Table S1 : Cotton data

Country	Crop water requirement (m ³ per ha)	Water footprint (m ³ per ton)	Product water footprint (m ³ per ton)	Crop irrigation requirement (m ³ per ha)	Irrigation water footprint (m ³ per ton)	Product irrigation water footprint (m ³ per ton)	References
Australia	-	-	-	4100	-	-	Ashton <i>et al.</i> , (2016)
	9980	-	-	-	117	-	Bartimote <i>et al.</i> , (2017)
	7800	-	-	-	-	-	Gordon and Brodrick, (2020)
	8000	-	-	-	-	-	Mushtaq <i>et al.</i> , (2013)
	-	-	-	3520	-	-	Williams <i>et al.</i> , (2018)
Brazil	10000	-	-	-	-	-	Doorenbos and Kassam, (1979)
China	-	1475	-	7245	-	-	Zhao <i>et al.</i> , (2015)
Global	-	11023	-	-	-	-	Agoramoorthy, (2013)
	-	11023	-	-	-	-	Averink, (2015)
	8390, 9150	10883	-	-	-	-	Barrett <i>et al.</i> , (2010)
	-	1395	-	-	1619	-	Fan <i>et al.</i> , (2018)
	-	3800	9113 (cotton lint), 9982 (cotton fabric)	-	-	2955 (cotton lint), 3253 (cotton fabric)	Mekonnen and Hoekstra, (2011)
	-	6400, 4000	-	-	-	-	Tuninetti <i>et al.</i> , (2019)
India	4190, 8290	6094.625	-	2215	-	-	Aujla <i>et al.</i> , (2008)
	8947.465	-	-	-	-	-	Ullah and Perret, (2014)
Karakalpakstan	6790	-	-	-	-	-	Mambetnazarov, (2016)
Pakistan	-	-	-	8092	-	-	Ahmad <i>et al.</i> , (2015)
	-	-	-	2891	2683	-	Imran <i>et al.</i> , (2019)
	-	4031	-	-	-	-	Ullah and Perret, (2014)
Turkey	5450	-	-	4365	-	-	Yilmaz <i>et al.</i> , (2021)
USA	8390	-	-	-	-	-	Schumacher <i>et al.</i> , (2020)2020
Uzbekistan	-	1132	-	2321	-	-	Allanov <i>et al.</i> , (2020)
	9278	-	-	8813	-	-	Conrad <i>et al.</i> , (2013)2013
Total (n)	13	11	2	9	5	2	

Table S2: Hemp data

Country	Crop water requirement (m ³ per ha)	Water footprint (m ³ per ton)	Product water footprint (m ³ per ton)	Crop irrigation requirement (m ³ per ha)	Irrigation water footprint (m ³ per ton)	Product irrigation water footprint (m ³ per ton)	Reference
Australia	5500	-	-	-	-	-	Gordon and Brodrick, (2020)
Europe	3480	-	-	-	-	-	Struik <i>et al.</i> , (2000)
Global	-	2566, 2997	2819 (hemp products)	0	0	-	Averink, (2015)
	-	440	-	-	-	-	Barrett <i>et al.</i> , (2010)
	-	-	2447 (hemp fibre and tow), 2719 (processed hemp fibre)	0	-	0 (hemp fibre and tow), 0 (processed hemp fibre)	Mekonnen and Hoekstra, (2011)
	-	-	-	0	0	-	Zatta <i>et al.</i> , (2012)
Italy	2965	-	-	-	-	-	Amaducci <i>et al.</i> , (2002)
UK	6000	-	2999.388 (hemp fibre)	-	-	-	Barrett <i>et al.</i> , (2010)
USA	6900	-	-	-	-	-	Adesina <i>et al.</i> , (2020)
	5300	-	-	-	-	-	Schumacher <i>et al.</i> , (2020)2020
Total (n)	6	3	4	3	2	2	

REFERENCES

- Adesina, I., Bhowmik, A., Sharma, H., Shahbazi, A., 2020. A review on the current state of knowledge of growing conditions, agronomic soil health practices and utilities of hemp in the United States. *Agriculture* 10, 129.
- Agoramoorthy, G., 2013. The Water Footprint of Modern Consumer Society By Arjen Y. Hoekstra. *Water resources management* 27, 3847-3848.
- Ahmad, S., Raza, I., Muhammad, D., Ali, H., Hussain, S., Doğan, H., Ziaulhaq, M., 2015. Radiation, water, and nitrogen use efficiencies of *Gossypium hirsutum* L. *Turkish Journal of Agriculture and Forestry* 39, 825-837.
- Allanov, K., Shamsiev, A., Durdiev, N., Avliyakov, M., Karimov, A., Khaitov, B., 2020. Improving nutrition and water use efficiencies of pima cotton (*Gossypium barbadense* L.) varieties under arid conditions of Uzbekistan. *Journal of Plant Nutrition* 43, 2590-2600.
- Amaducci, S., Errani, M., Venturi, G., 2002. Plant population effects on fibre hemp morphology and production. *Journal of Industrial hemp* 7, 33-60.
- Ashton, D., Oliver, M., Norrie, D., 2016. Cotton farms in the Murray-Darling Basin, ABARES Research Report, 3 ed.
- Aujla, M., Thind, H., Buttar, G., 2008. Response of normally sown and paired sown cotton to various quantities of water applied through drip system. *Irrigation science* 26, 357-366.
- Averink, J., 2015. Global water footprint of industrial hemp textile, *Water Engineering and Management*. University of Twente, Enschede.
- Barrett, J., Chadwick, M., Chadwick, M., 2010. Ecological footprint and water analysis of cotton, hemp and polyester, in: Cymru, B.D.G.a.W. (Ed.).
- Bartimote, T., Quigley, R., Bennett, J.M., Hall, J., Brodrick, R., Tan, D.K., 2017. A comparative study of conventional and controlled traffic in irrigated cotton: II. Economic and physiological analysis. *Soil and Tillage Research* 168, 133-142.
- Conrad, C., Rahmann, M., Machwitz, M., Stulina, G., Paeth, H., Dech, S., 2013. Satellite based calculation of spatially distributed crop water requirements for cotton and wheat cultivation in Fergana Valley, Uzbekistan. *Global and planetary change* 110, 88-98.
- Doorenbos, J., Kassam, A., 1979. Yield response to water, In: Johl, S.S. (Ed.), *Irrigation and Agricultural Development: Based on an International Expert Consultation*, Baghdad, Iraq, 24 February - 1 March 1979. Pergamon Press, Great Britain, pp. 257-280.
- Fan, Y., Wang, C., Nan, Z., 2018. Determining water use efficiency of wheat and cotton: A meta-regression analysis. *Agricultural Water Management* 199, 48-60.
- Gordon, S., Brodrick, R., 2020. A comparative analysis of cotton and hemp production in Australia, *The Australian Cottongrower*, pp. 42-45.
- Imran, M.A., Ali, A., Ashfaq, M., Hassan, S., Culas, R., Ma, C., 2019. Impact of climate smart agriculture (CSA) through sustainable irrigation management on Resource use efficiency: A sustainable production alternative for cotton. *Land Use Policy* 88, 104113.
- Mambetnazarov, A., 2016. Features of water consumption of cotton on irrigated lands of Karakalpakstan. *Bulg. J. Agric. Sci* 22, 250-252.
- Mekonnen, M.M., Hoekstra, A.Y., 2011. The green, blue and grey water footprint of crops and derived crop products. *Hydrology and Earth System Sciences* 15, 1577-1600.
- Mushtaq, S., Maraseni, T., Reardon-Smith, K., 2013. Climate change and water security: estimating the greenhouse gas costs of achieving water security through investments in modern irrigation technology. *Agricultural Systems* 117, 78-89.
- Schumacher, A.G.D., Pequito, S., Pazour, J., 2020. Industrial hemp fiber: A sustainable and economical alternative to cotton. *Journal of Cleaner Production* 268, 122180.
- Struik, P., Amaducci, S., Bullard, M., Stutterheim, N., Venturi, G., Cromack, H., 2000. Agronomy of fibre hemp (*Cannabis sativa* L.) in Europe. *Industrial crops and products* 11, 107-118.
- Tuninetti, M., Tamea, S., Dalin, C., 2019. Water debt indicator reveals where agricultural water use exceeds sustainable levels. *Water Resources Research* 55, 2464-2477.
- Ullah, A., Perret, S.R., 2014. Technical-and environmental-efficiency analysis of irrigated cotton-cropping systems in Punjab, Pakistan using data envelopment analysis. *Environmental management* 54, 288-300.
- Williams, A., Mushtaq, S., Kouadio, L., Power, B., Marcussen, T., McRae, D., Cockfield, G., 2018. An investigation of farm-scale adaptation options for cotton production in the face of future climate change and water allocation policies in southern Queensland, Australia. *Agricultural Water Management* 196, 124-132.
- Yilmaz, E., Gürbüz, T., Dağdelen, N., Wzorek, M., 2021. Impacts of different irrigation water levels on the yield, water use efficiency, and fiber quality properties of cotton (*Gossypium hirsutum* L.) irrigated by drip systems. *Euro-Mediterranean Journal for Environmental Integration* 6, 1-7.
- Zatta, A., Monti, A., Venturi, G., 2012. Eighty years of studies on industrial hemp in the Po Valley (1930-2010). *Journal of Natural Fibers* 9, 180-196.
- Zhao, X., Othmanli, H., Schiller, T., Zhao, C., Sheng, Y., Zia, S., Müller, J., Stahr, K., 2015. Water use efficiency in saline soils under cotton cultivation in the Tarim River Basin. *Water* 7, 3103-3122.