



PRESENTED BY COTTON UNIVERSITY™

Life Cycle Assessment of Cotton

QUESTIONS & ANSWERS

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| 1. What is a life cycle inventory? | A life cycle inventory is a database to store data needed to conduct a life cycle assessment. |
| 2. Have you ever made an energy analysis in order to complete an LCI for cotton? | Yes, tracking all of the energy used is a key component of a life cycle assessment. |
| 3. What is blue water consumption? | Blue water consumption is water that is removed from the ground, stream, or lake but not returned to the watershed it was taken from. |
| 4. Is this LCA transferable to cotton nonwoven products too? | The agricultural phase would apply to nonwovens, but the other phases of the study would not. |
| 5. Why didn't you compare your results with other fibers used in textile manufacturing for example? | A challenge for comparing any LCA data is being sure the background data is comparable. |
| 6. Were there differences in results for conventional cotton versus organic cotton? | We did not collect data on organic cotton as our priority was to characterize the most common global cotton practices. Organic is less than one percent of the world's cotton. |
| 7. How does the lifecycle of 1 kg of cotton compare to 1 kg of Tencel or Modal? | We do not have a global average Tencel or Modal LCA that is ISO certified that would allow comparison with our current study. |
| 8. Do you track the amount of water used in growing cotton and the production of the material? | We tracked all of the inputs used in growing cotton including water, energy, and fertilizer. |
| 9. For this LCA, where was the use-phase evaluated? How many laundering cycles were considered? | Use phase data was collected in the U.S., China, Japan, Italy, Germany and the United Kingdom. Survey responses indicated that the average global consumer was washing a polo shirt about 20 times during the life cycle (first use), but often would use more than once per wash. |
| 10. What do cotton producers think about utilizing hemp as it pertains to cover crops and rotational crops? | Hemp could be a feasible rotational crop. We have had studies to use flax as a winter crop in a double cropping system. |
| 11. How do these results stack up vs. lower technology cotton producers? | Many of the regions in China and India where data was collected had predominately small holder farmers. Therefore, they are represented in the global average. |

12. **With waterless methods being used across the industry, are you studying this (i.e. How much water is actually being saved)?** We have evaluated several low-water technologies for cotton documenting the benefits and opportunities versus conventional cotton wet processing methods.
13. **Are all cotton producing countries applying these same steps to improve cotton fiber production as discussed (i.e. targeted fertilization of crops and targeted watering)?** Yes, at some level all cotton producers are trying to find ways to make better use of their inputs. In the U.S. and Australia, producers are using advanced technologies such as in the field sensors, but even in India the government is sponsoring programs to help farmers increase input efficiency through education on best management practices.
14. **Did this particular LCA explore the end of life cycle of cotton that is not recycled and that degrades in landfills? Would this affect the water impact/global warming impact when these fibers begin to degrade back into the environment?** We did assume the carbon capture in the cotton fiber was re-emitted to the atmosphere at the time of disposal.
15. **Can cotton be grown indoors and without soil, like how AeroFarms grows greens in an urban environment?** Yes - cotton can be grown using a system like the one used by AeroFarms.
16. **If carbon dioxide is being used by the plant, how is this causing issues for people?** Cotton is helping humans by converting the carbon dioxide that we exhale into oxygen that we inhale.
17. **How do these results compare to other types of cotton, e.g. organic? And to the previous Cotton Inc LCA results conducted?** We did not collect data on organic cotton as our priority was to characterize the most common global cotton practices, and organic is less than 1% of the world's cotton. The results of this updated study were very similar to our last study for the agricultural and textile phases. The impact in all of the indicators was lower in the consumer phase as we considered a global versus a U.S. consumer in the latest study.
18. **In the slide "Energy results in context," please explain what "others" means.** "Others" includes paper and food production, machinery manufacturing, and mining. Refer to this source for more details: https://www.iea.org/publications/freepublications/publication/tracking_emissions.pdf
19. **It seems that with the high energy amount needed in petrochemicals, we can assume synthetics such as polyester use a lot of energy to produce. Is this true? Should we be marketing that (assumed) fact as a way to increase the appreciation of cotton as a fabric that is more energy friendly?** We do not have a global average polyester that is ISO certified that would allow comparison with our current study, but the data we do have supports the statement that polyester is more energy intensive to create than cotton. We are exploring better ways to increase our marketing message about the benefits of cotton as a natural fiber.
20. **Where are the 13 representative mills located worldwide?** To protect the mills identify, we only specify the locations in very broad terms, so Latin America and Asia are regions where the mills are located.

- 21. What is the average global yield per acre for cotton?** Average global cotton yields were 775 kg per ha during the study period (2010 to 2014). Refer to this source for more details: <https://apps.fas.usda.gov/psdonline/app/index.html#/app/advQuery>
- 22. Since this data set is transparent and now public, are there plans to use it as a promotional tool, perhaps calling out other fiber manufacturers to release datasets?** Yes, we hope other fibers will make a similar investment in a global, transparent, ISO compliant and reviewed life cycle inventory.