

Understanding the water and toxicity footprints of cotton products

Objective

Cotton Incorporated wanted to identify the key sources of water use and toxicity within the life cycle of a cotton knit shirt in order to:

- Better inform decisions along the cotton textile supply chain
- Achieve and measure reductions in the water and toxicity impact of textile products
- Direct research resources more efficiently
- Answer demands of stakeholders

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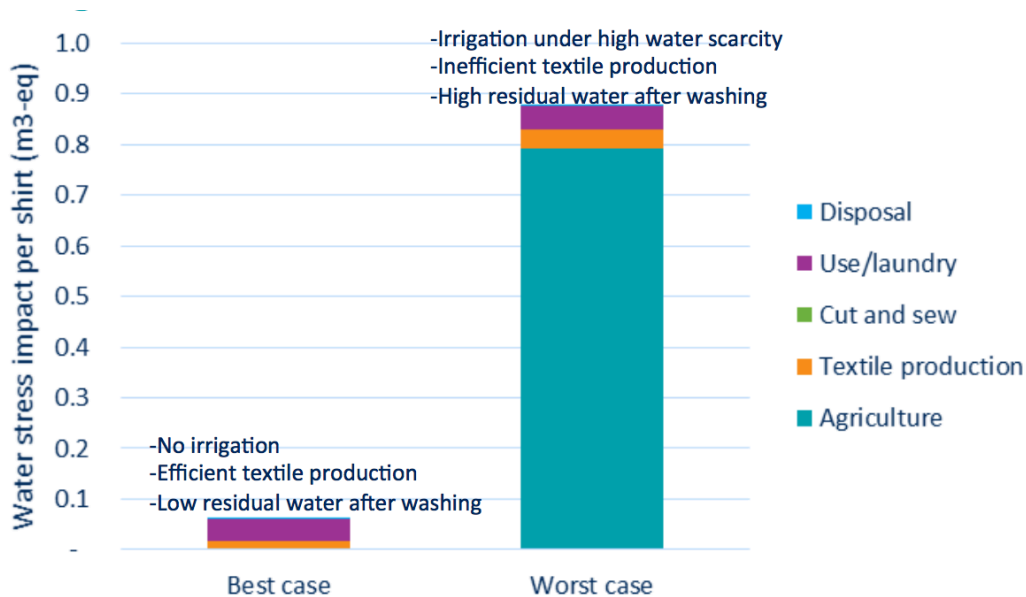
- Cotton Incorporated had the results of a basic LCA of a cotton shirt. Quantis took it a step further by assessing water consumption, water stress, and water degradation, as well as toxicity to humans and to freshwater species.
- Then, Quantis evaluated different farming and textile production scenarios to understand how farming practices, textile production practices and textile production regions affect the water and toxicity footprint of a cotton knit shirt.
- The key learnings were helpful for Cotton Incorporated to use and communicate these multi-indicator assessment results.

“This assessment enhanced our understanding of some key cotton sustainability issues. We are now better able to respond to stakeholders and focus our sustainability efforts.”

Michele Wallace
Director, Product Integrity
Cotton Incorporated



Growing practices and conditions can have a large influence on outcomes



- The results indicate that the growing practices, such as irrigation rate and pesticide regimen, as well as growing conditions, such as water scarcity, can have a major influence on the impact of growing cotton.
- The results also show that modelling decisions, such as how toxic metals are considered, can be very influential.

Key findings

- Within the life cycle of a cotton product, the emission of **heavy metals** (usually in the energy supply chain) dominate human toxicity impacts; however, their impact is highly uncertain.
- The toxicity impact on freshwater species from **pesticides** applied on-farm and from **laundry detergent** washed down the drain are both variable and potentially large compared to toxicity impacts from the rest of the life cycle of a cotton knit shirt.
- The **irrigation** rate and **local water stress** are key determinants of total life cycle water consumption and impacts. If cotton is not irrigated, then the **use (laundry)** stage and the **textile production** stage are the primary contributors to water consumption within the life cycle of a cotton shirt.

Client's actions

- Perform additional research to further understand the importance of models used to measure the impact of water use and fertilizer on the environment.