

REDUCING TEXTILE WATER WASTE

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INTRODUCTION

The textile industry uses vast amounts of fresh water, for dyeing, rinsing, and other treatments. In turn, dye baths release colored wastewater into the ecosystem causing esthetic pollution, eutrophication, and perturbations in aquatic life. Dye baths usually contain high concentrations of organic compounds as well as inorganic. (Van der Bruggen, De Vreese, & Vandecasteele, 2001, pg. 3973) The water reuse in the textile industry is less than 70%, lower than the national industry's average level of 80%. The textile industry is one of the leading polluters of surface water and consumes about 200–270 tons of water to produce 1 ton of textile products. (Bhatia, Sharma, Kanwar, & Singh, 2018, pg. 1) Implementing sustainability techniques in the textile industry is a way to minimize the environmental impact water use has on our planet.



Shirt 1



Shirt 2



Shirt 3

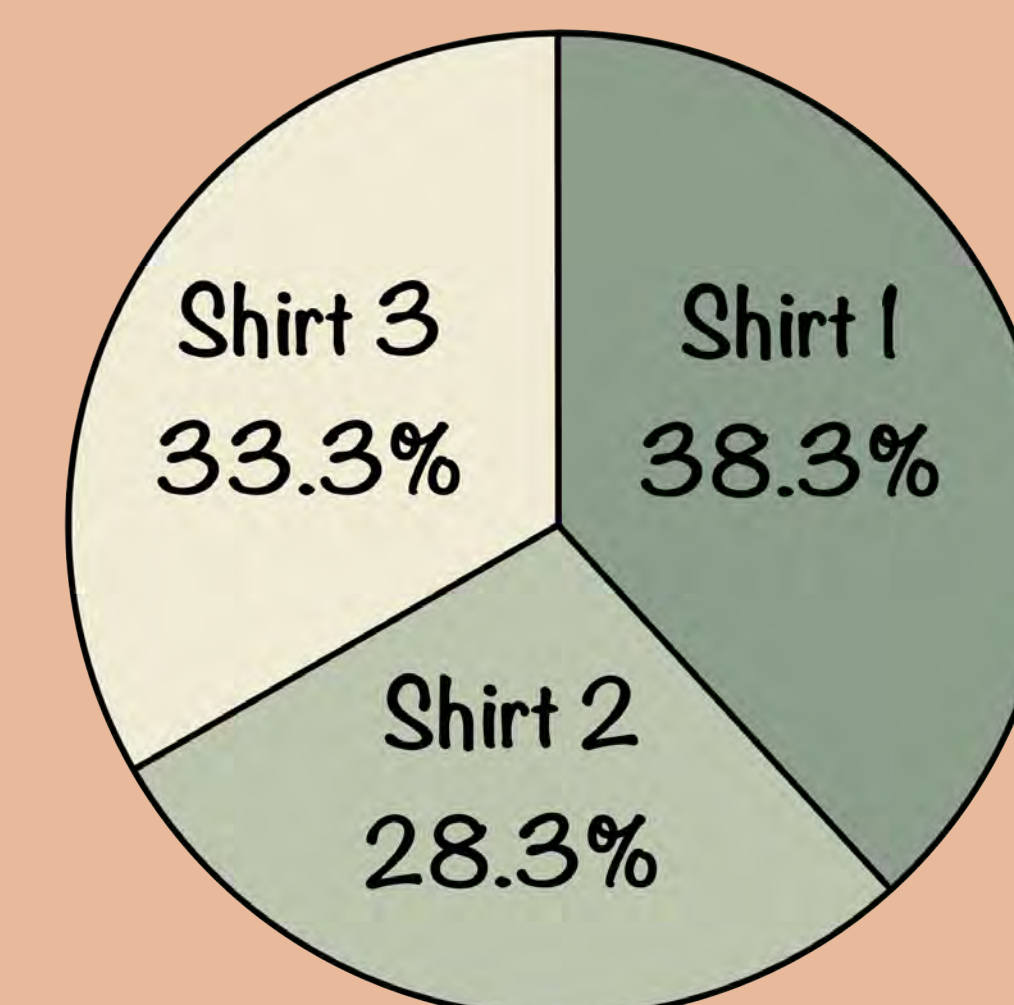
METHODS

Research was conducted to find alternative textile dyeing techniques that reduce water waste and use natural dyeing elements. Three shirts were dyed using different methods. The first shirt was dyed using Rit dye to emulate commercial dyeing processes and rinsed while still wet after 24 hours. The second shirt was dyed using a natural dye made from cabbage and baking soda. The second shirt was then removed from the dye after 24 hours and allowed to dry fully before rinsing. The third shirt was dyed with the same cabbage dye as the second shirt and was rinsed while still wet after 24 hours. A survey was conducted to see which shirt consumers preferred based only on their color and were also asked questions about the dye methods used.

RESULTS

- 87.5% of respondents correctly chose the naturally dyed shirt.
- 63.3% of respondents correctly chose the standard dyed shirt.
- 36.7% of respondents correctly chose the shirt dyed with a water saving technique.
- The majority of respondents believe natural dye techniques could be used in place of standard techniques since it did not majorly affect which shirt they chose.

Shirt Preferences Based on Color



CONCLUSIONS

After researching whether or not the textile industry will be able to use household water saving techniques to reduce the amount of water waste on a broad scale, our results suggest it is possible to employ water saving techniques to cut down on the water wasted.

From our survey, responses showed that while most consumers could tell which shirt had been dyed with synthetic dye, it had little impact on their choice of favorite shirt color. Due to current trends it appears that natural dye will produce just as favorable consumer preference as synthetic dyes. Although the textile industry has improved in some aspects, much more remains to be done to get the textiles to a level of sustainability to preserve ecosystems and human lives.

Future research should focus on ways to implement natural dyes and water saving techniques into industrial dyeing processes.

REFERENCES

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- Van der Bruggen, B., De Vreese, I., & Vandecasteele, C. (2001). Water reclamation in the textile industry: nanofiltration of dye baths for wool dyeing. *Industrial & Engineering Chemistry Research; Ind.Eng.Chem.Res.*, 40(18), 3973-3978.