

Cocoon Drying Methods and Its Impact on Various Post Cocoon Traits in Sericulture

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Silk production, specifically the reeling performance and quality of raw silk, can be significantly influenced by the drying method of cocoons. A comparative study on mulberry bivoltine cocoons reveals that drying cocoons under black cloth yields superior results compared to direct sun drying. The study showed that cocoons dried under black cloth perform better in reeling quality and the final silk produced is of higher quality, both in terms of strength and appearance. In contrast, cocoons exposed to prolonged direct sunlight result in a weaker reeled silk, increased yellowness of the cocoons, and a duller silk luster.

Direct sunlight, especially over an extended period, has a negative impact on various post-cocoon traits such as cocoon weight, shell weight, and shell percentage. Moreover, ultraviolet (UV) rays cause a marked deterioration in reeling performance due to filament breakage. This has a cascading effect on key silk production metrics, including reelability, filament length, raw silk percentage, raw silk recovery, and denier. The study found that UV rays are the primary factor responsible for these negative effects, making direct sun drying a less desirable method for maintaining silk quality.

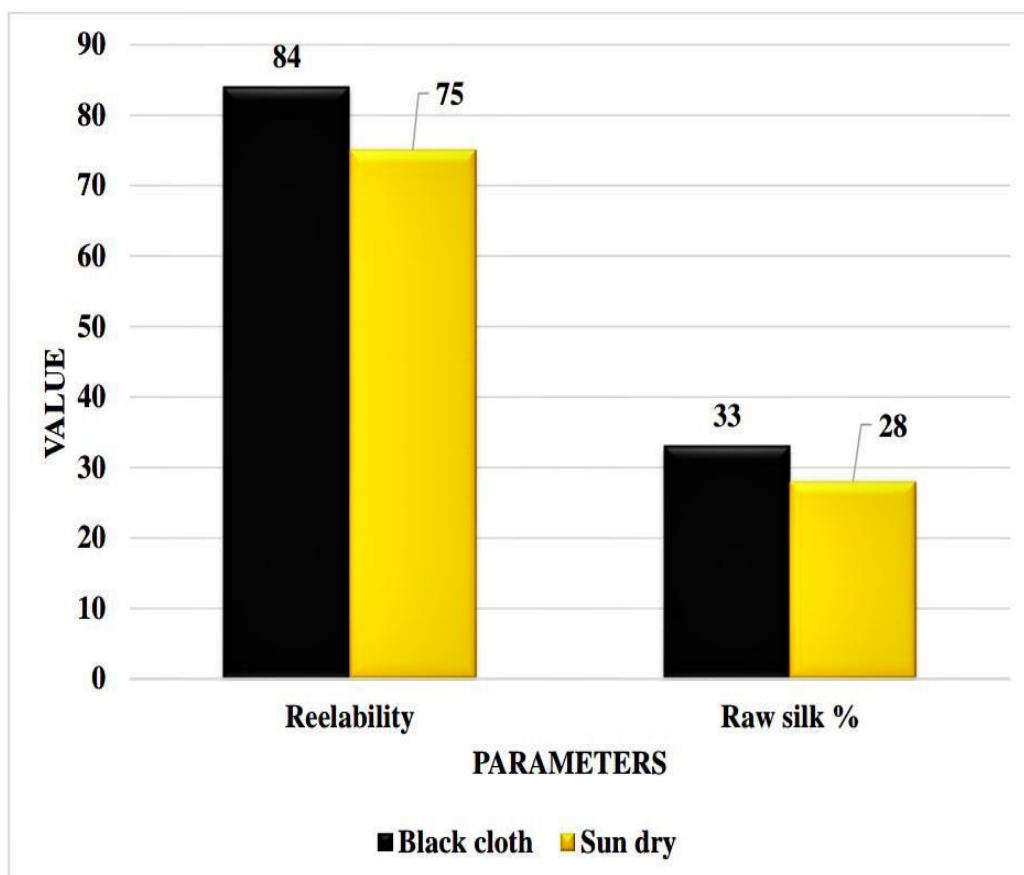
In contrast, the use of black cloth during the drying process counters the harmful effects of UV rays, resulting in fewer filament breakages. This significantly improves the overall reeling performance. Bivoltine cocoons subjected to the black cloth drying method typically require 4-5 days of drying, compared to 7-8 days in direct sunlight. The black cloth helps in regulating the temperature and protecting the cocoons from direct UV exposure, which leads to better quality silk. Notably, the cocoons retain their natural color and luster when dried under black cloth, while those dried in the sun tend to lose these qualities, resulting in dull and yellowed silk.

The study underscores that the black cloth drying method is not only more effective but also more economical and practical in large-scale silk production. This method maintains

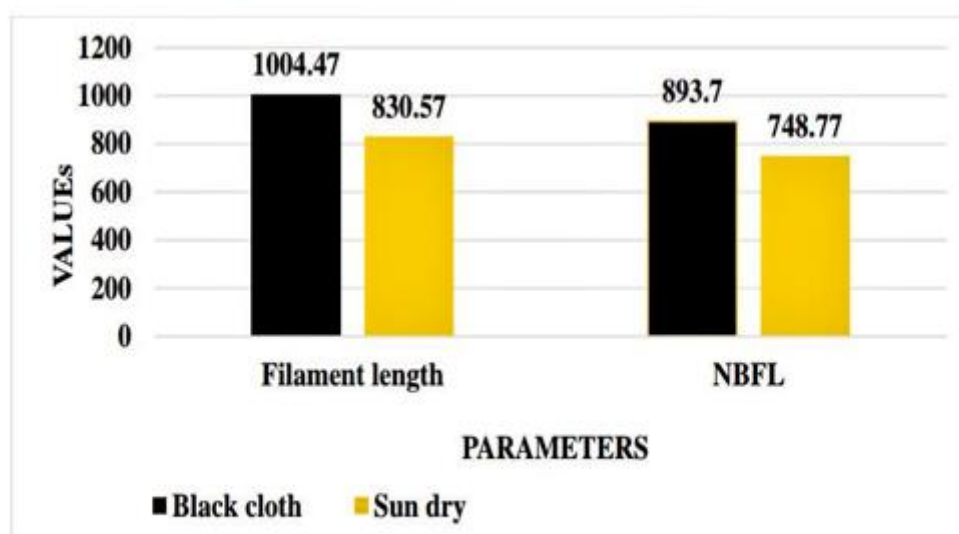
uniform quality across all cocoons, which is crucial for producing consistent, high-grade silk. Furthermore, because this technique reduces filament breakage, it also reduces silk waste during the cooking and reeling process, thus improving efficiency and reducing costs.

Prolonged exposure to sunlight, on the other hand, leads to higher levels of silk waste during processing. The increased waste not only affects the overall yield but also diminishes the quality of the final product, making direct sun drying a less efficient and profitable method for silk producers. Given these findings, the study strongly recommends the use of black cloth drying for bivoltine cocoons as a superior alternative to sun drying.

In conclusion, the black cloth drying method proves to be a more effective, economical, and sustainable way to dry bivoltine cocoons. It not only ensures better reeling performance but also preserves the natural qualities of the silk, making it a preferable technique for silk producers who aim for high-quality raw silk and reduced production waste.



Graph: Mean performance of Reelability and Raw silk % of cocoons dried by Black cloth and direct sunlight



Graph: Mean performance of sunlight Filament length and NBFL of cocoons dried under black cloth and direct sunlight

Summary

The comparative reeling performance clearly indicated that the deleterious effect of ultra- violet rays had majority impact on the post cocoon traits such as cocoon weight, shell weight, shell %, reelability, filament length, raw silk %, raw silk recovery%, denier and waste % on silk weight and similarly Black cloth drying counter the ultra-violet rays, due to filament breakage retarded, hence reeling performance was better. It is also observed that black cloth drying method is techno-economical, and uniform quality of cocoons is maintained. It retains natural color and luster of raw silk. While as, Prolonged exposure to direct sunlight adversely affects the quality of silk and increase silk wastes during cooking and reeling. The study also recommends that bivoltine cocoons should be dried using Black cloth because this technique provide uniform drying and was effective as compared to sun drying.