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SHORT COMMUNICATION

Mulching effect on seed germination, seedling rot disease, cotton wilt, and seed cotton yield of Cotton (*G. hirsutum* L.)

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ABSTRACT

The aim of present study was to evaluate the effect of mulching against germination per cent, fungal diseases (seedling rot and wilt) of cotton, and seed cotton yield. The results regarding the effectiveness of different mulch on germination of cotton seeds, mortality of seedlings, wilt disease of cotton, and seed cotton yield showed significant difference. In the case of maximum germination (34.6%) was observed in Rice Straw (Mulch) and minimum germination (23.9 %) was observed in control. Highest seedling rot incidence (6.5%) and wilt incidence (2%) was observed in control, and minimum seedling rot (4.0%) and wilt incidence (0.5%) was observed in treatment covered by Rice Straw (Mulch). The maximum seed cotton yield (3446 kg ha^{-1}) was recorded in treatment mulched by Rice Straw, while minimum seed cotton yield (1674 kg ha^{-1}) was recorded in control where no any mulch was used.

Keywords: Cotton; Mulch; Germination; Seedling rot; Wilt; Seed cotton yield

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INTRODUCTION

Cotton (Gossypium spp.) is the most important natural fibre crop and a major cash crop in many countries globally. (Kumar et al., 2013; Ashokkumar et al., 2014; Kumar et al., 2015). It is used in textile and oil sectors, and it is exported as raw cotton, cotton yarn, grey clothing, garments, and other cotton products (Ashokkumar et al., 2013; Kumar et al., 2015). Cottonseed is an important source of edible oil. Cottonseed is the world's second-largest oil source (Ashokkumar and Ravikesavan, 2009; 2011 & 2013). Cottonseed oil is a healthy vegetable oil. This cholesterol-free "Heart oil" (Ashokkumar and Ravikesavan, 2013).

Mulching is the practise of covering soil with various materials to reduce moisture loss, weed growth, and increase crop yield (Kader et al., 2019). Polyethylene mulch outperformed fungicides in suppressing Phytophthora infestans on tomato plants (Shtienberg et al., 2010). Researchers discovered that animal manure and fresh green manure lowered oospore viability and incidence. Phytophthora cinnamomi with oat straw mulch in avocado (You and

Sivasithamparam, 1995). Fortnum et al. (2000) claim that plastic mulch improves water and fertiliser use while controlling weeds. Poly mulching increased seed cotton output by 39%, according to Elias and Goldhamer (1991). Water hyacinth mulch outperformed rice straw mulch in terms of crop output. The impact of mulch on nutrient availability and soil physical qualities is dependent on mulch quantity, quality, soil properties, and environment (Lal, 1995). On the basis of the above interests, the current study evaluated the effect of mulching on seed germination, fungicide resistance, and cotton seed production.

MATERIALS and METHODS

The effect of organic mulch on germination, cotton diseases (Seedling rot and wilt), and seed cotton output was studied in the field using rice straw, banana leaves, and wheat boosa/straw as mulch in 2015. The experimental field's soil was clay loamy with a pH of 7.25. A specific organic mulch was added immediately after seeding cotton.

The experiment used an RCBD with four replications and a 20x30 plot. It was used as mulch on rice, wheat, and dry banana (10 and 20 tha-1). Seed germination, seedling diseases, wilt disease, and disease plants were taken in the laboratory and studied the disease caused pathogen. Mulches were collected from the Magsi farm near Panjmoro Tuleka. These were crushed up and easy to disperse on the field. The mulch layer thickness varied depending on the mulch.

RESULT AND DISCUSSION

The effect of difference mulch on the percentage of seed germination showed significantly maximum seed germination (34.6%) was observed in Rice Straw (Mulch) flowed by Wheat boosa (32.70%), Banana leaves were (29.3%) minimum (23.9 %) was observed in control (Figure 1).

The differences between treatments were significant. Minimum seedling rot (4%) was observed in Rice Straw (Mulch) flowed by Wheat boos (4.6%), Banana leaves were (5.5%) Maximum (6.5%) was observed in Control show (Figure 1).

The differences between treatments were significant. Minimum Wilt disease (0.5%) was observed in Rice Straw (Mulch) flowed by Wheat boosa (1.0%); Banana leaves were (1.0%) Maximum (2.0%) was observed in control in (Figure 1).

The differences between treatments were significant. Maximum Seed cotton yield (3446 kg ha^{-1}) was observed in Rice Straw (Mulch) flowed by wheat boosa (2511 kg ha^{-1}), Banana leaves were (2391 kg ha^{-1}), and minimum yield (1647 kg ha^{-1}) was observed in control. Barker and Bhowmik (2001) found that applying plant leftovers improved weed control and yield. The results matched Adetuji's (1990). Organic mulching increased lettuce's fresh and dry weight, he said. Mulch facilitates proper transpiration, nutrient uptake, and photosynthesis.

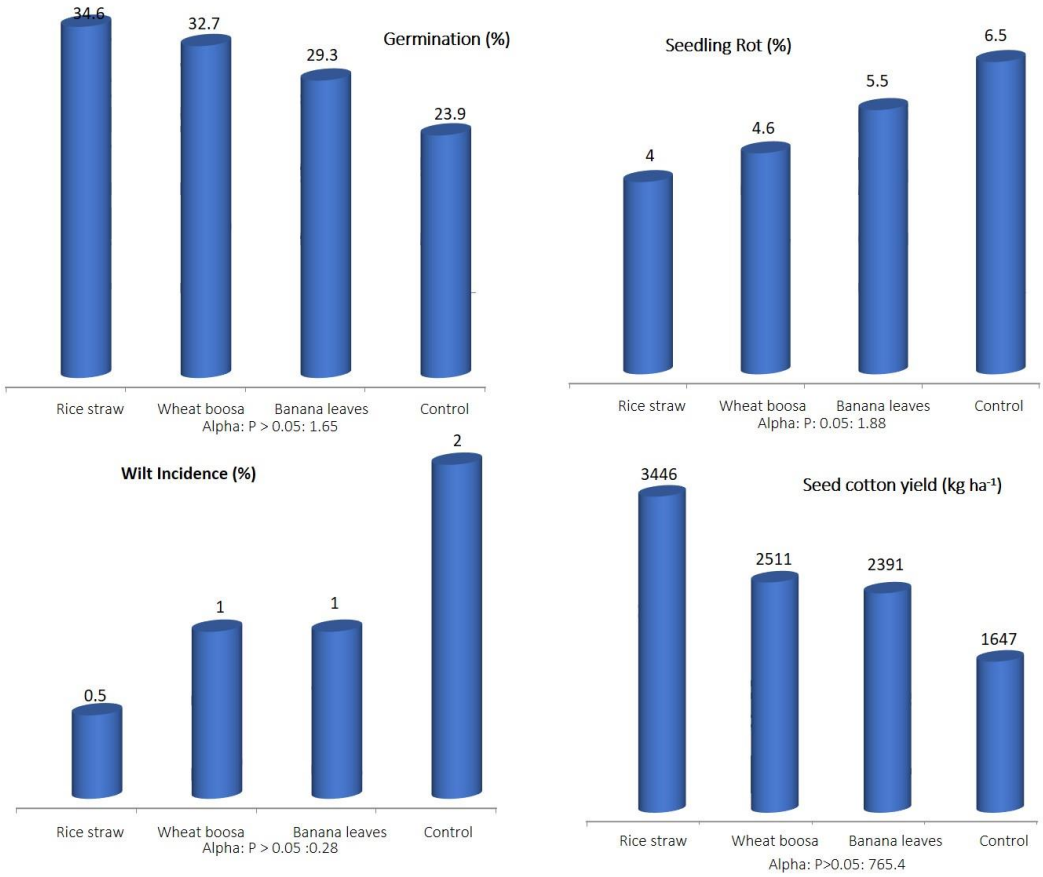

Figure 1. Effectiveness of different mulch on seed germination (%), seedling rot (%), wilt incidence (%) and seed cotton yield (kg ha^{-1})

CONCLUSION

The trial indicated that rice straw outperformed other mulching materials in terms of seed germination, seedling diseases, wilt, and seed cotton production.

REFERENCES

Ashokkumar, K., & Ravikesavan, R. (2009). Understanding the genetic variation of Seed oil, seed protein and seed index traits in upland cotton (*G. hirsutum*. L). "International Conference on Emerging trends in Production, Processing and Utilization of Natural Fibres", Mumbai. p.42-48.

Ashokkumar, K. & Ravikesavan, R. (2011). Conventional and Molecular breeding approaches for seed oil and seed protein content improvement in cotton. *International Research Journal of Plant Science, 2*(1), 37-45.

Ashokkumar, K. & Ravikesavan, R. (2013). Genetic variation and heterotic effects for seed oil, seed protein and yield attributing traits in upland cotton (*G. hirsutum* L.). *African Journal of Biotechnology*, *12*(33), 5183-5191.

Ashokkumar, K., Kumar K. S. & Ravikesavan R. (2014). An update on conventional and molecular breeding approaches for improving fiber quality traits in cotton - A review. *African Journal of Biotechnology*, *13*(10),1097-1108.

Ashokkumar, K., Kumar, K. S., & Ravikesavan, R. (2013). Heterosis studies for fibre quality of upland cotton in line x tester design. *African Journal of Agricultural Research, 8*(48), 6359-6365.

Barker, A. V., & Bhowmik, P.C. (2001). Weed control with crop residues in vegetable cropping system. *Journal of Crop Production*, *4*(2), 163-183.

Elias Fereres, & David A. Goldhamer. (1991). Plastic mulch increases Cotton Yield, reduces need for preseason irrigation. *California agriculture, 45*(1), 25-28.

Fortnum, R. A. Kasperauer, M. J., & Decoteau, D. R. (2000). Effect of Mulch Surfacecolour on root – knot nematode of Tomato grown in simulated planting beds. *Journal of Nematology*, *32*(1), 101- 109.

Kader, M. A., Singha, A., Begum, M. A., Jewel, A., Khan, F. H., & Khan, N. I. (2019). Mulching as water-saving technique in dry land agriculture. *Bulletin of the National Research Centre*, *43*, 1–6.

Kumar, K. S., Ashokkumar, K., & Ravikesavan, R. (2015). Diallel Analysis and Heterotic Effects for Yield and Fibre Quality Traits in Upland Cotton. *Indian Journal of Natural Sciences, 6*(33),10484-10494.

Kumar, K. S., Ashokkumar, K., & Ravikesavan, R. (2016). Genetics of Yield Traits, Seed Cotton Yield and Fibre Quality Traits in Upland Cotton (*Gossypium hirsutum* L.). *Indian Journal of Natural Sciences, 6* (35), 10866-10877.

Lal, R., & Stewart, B. A. (1995). Managing soils for enhancing and sustaining agricultural production. Soil Management: Experimental Basis for Sustainability and Environmental Quality. CRC Lewis Publishers, Boca Raton, FL, p.1–9.

Ramakrishna, A., Ong, C. K., & Reddy, S. L. N. (1991). Integrated weed management for rainfed groundnut. *Journal of Plant Protection in Tropics*, *8*, 111– 119.

Shekoofa, A., Safikhan, S., Raper, T. B. & Butler, S. A. (2020). Allelopathic impacts of cover crop species and termination timing on cotton germination and seedling growth. *Agronomy, 10*, 638.https://doi.org/10.3390/agronomy10050638