

Brown Manures in Crop Production

*Dr. C. Agila

Assistant Professor (Agronomy), Kumaraguru Institute of Agriculture, Tamil Nadu

*Corresponding Author's email: c.agila1992@gmail.com

Soil fertility is decreasing day by day due to continues use of chemical fertilizers, excessive tillage and mono cropping. Depletion of organic matter, loss of soil structure, and erosion further degrade soil quality. Additionally, conventional farming practices can cause nutrient imbalances, reduce microbial activity, and ultimately diminish crop yields. Brown manures is the advance technology which reduces the weeds without harming the soil physical, chemical and biological properties. To enhance soil fertility, Brown manuring is an innovative, eco-friendly technique where an additional cover crop is sown along with the main standing crop. These cover crops are later terminated using non-selective herbicides, typically at the flowering stage. Once desiccated, the cover crop residues remain in the field, turning brown in color, so it is called brown manuring. Unlike traditional green manuring that involves tilling the soil to incorporate the biomass, brown manuring is a no-till approach, leaving the residues on the soil surface by using the herbicides. By enhancing soil structure and microbial activity, brown manuring also supports nutrient recycling, contributing to long-term soil fertility and sustainability in cropping systems.

Crops suitable for brown manuring

Leguminous crops: Crops provide nitrogen as well as organic matter to the soils. Legumes can fix atmospheric nitrogen with the help of its nodule bacteria. The legumes are preferably used in green manuring crops. Ex: Sun hemp, Dhaincha.

Non leguminous crops: The non leguminous crops used as a green manuring crop which provide only organic matter to the soil. These are used to a limited extent. Example: Niger, Wild indigo. The integration of leguminous crops with cereals is considered an ideal practice. Cereals can efficiently utilize a portion of the nitrogen fixed by legumes, creating a synergistic effect that boosts yield and maintains soil fertility. This combination offers a range of benefits, including improved productivity, sustainable soil health, and enhanced ecosystem services, such as better water retention and nutrient cycling. The intercropping system of legumes and cereals not only supports higher yields but also contributes to long-term sustainability by minimizing the need for synthetic fertilizers and promoting natural nutrient replenishment.

Benefits of using brown manuring

Enhanced Soil Organic Carbon and Nitrogen Efficiency: Brown manuring increases soil organic carbon levels, which in turn supplies essential nitrogen to crops. About 25% of nitrogenous fertilizer can be substituted by the nitrogen provided through brown manuring, reducing dependency on synthetic fertilizers.

Eco-Friendly Weed Management: Brown manuring serves as an environmentally sustainable method for weed suppression. For example, the use of Sesbania in direct-seeded rice systems has been shown to reduce weed density by 41–56%

Affordability for Resource-Poor Farmers: Many Indian farmers operate with limited financial resources, brown manuring offers substantial benefits with minimal input costs, making it an economically viable solution for improving soil health and crop productivity. With increasing emphasis on sustainable agriculture and resource conservation, brown manuring has strong potential to become an important component of integrated nutrient management. Advances in precision agriculture, improved seed varieties, and better weed management practices can further enhance the efficiency of brown manuring systems. Agricultural extension programs and farmer training initiatives are essential to promote awareness and adoption of this technique. Integrating brown manuring with other practices such as conservation tillage, crop rotation, and organic amendments can contribute to resilient and sustainable farming systems.

Conclusion

Brown manuring is an unconventional and eco-friendly approach of weed management that not only suppresses weeds but also improves soil health, conserves soil moisture and leads to higher crop productivity and more economic benefits to the farmers. As the technology is cost effective and easy to adopt, it is also suited for resource-poor marginal farmers and need to be popularised among farming community