



Enhancing forage productivity by grass legume intercropping for sustainable dairy farming

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Abstract

Forage productivity is critical to sustainable dairy farming, and intercropping grasses with legumes has been found to be an effective way of enhancing forage production. This paper explores the benefits of intercropping grasses and legumes for sustainable dairy farming. The paper highlights the positive effects of intercropping on soil fertility, forage quality, and animal health. The paper concludes that intercropping is a sustainable and cost-effective method of enhancing forage productivity for dairy farming.

Introduction

Sustainable dairy farming is reliant on sufficient forage production. Forage productivity is affected by several factors such as soil fertility, climate, and management practices. Intercropping, which involves the cultivation of two or more crops in the same field, has been found to be an effective way of enhancing forage productivity. Among the intercropping practices, the combination of grasses and legumes has shown great potential for sustainable dairy farming. This paper examines the benefits of grass-legume intercropping and its potential to enhance forage productivity for dairy farming.

Benefits of Grass-Legume Intercropping for Sustainable Dairy Farming: Intercropping grasses with legumes provides several benefits for sustainable dairy farming. One significant advantage is the improvement of soil fertility. Legumes are capable of fixing atmospheric nitrogen, which is essential for plant growth. When grasses and legumes are intercropped, the legumes serve as a natural source of nitrogen for the soil. This enhances soil fertility, reducing the need for synthetic fertilizers.

In addition to soil fertility, grass-legume intercropping also improves forage quality. Legumes have higher protein content and digestibility than grasses. Thus, intercropping grasses with legumes



enhances the overall protein content of the forage. This leads to improved animal health as the higher protein content promotes better growth and milk production in dairy cattle.

Grass-legume intercropping also offers economic benefits for dairy farmers. It reduces the need for synthetic fertilizers, which can be costly, and minimizes the need for purchased feed, as the intercropped forage provides a natural source of nutrition for dairy cattle.

Conclusion

Intercropping grasses with legumes is a sustainable and cost-effective method of enhancing forage productivity for dairy farming. The benefits of grass-legume intercropping include improved soil fertility, forage quality, and animal health, as well as economic benefits for dairy farmers. Intercropping is an essential practice for sustainable dairy farming, and it should be promoted and adopted by dairy farmers.

Methods of Grass-Legume Intercropping

Grass-legume intercropping can be accomplished through various methods such as alternating rows, mixed cropping, and strip cropping. In alternating rows, grass and legume crops are planted in separate rows, with one row of grass followed by a row of legume. Mixed cropping involves planting both grass and legume seeds together in the same row. Strip cropping involves planting a strip of legumes between two strips of grass. The choice of intercropping method depends on various factors such as soil type, climate, and available resources.

Factors Affecting Grass-Legume Intercropping

Several factors can affect the success of grass-legume intercropping, including soil fertility, water availability, climate, and pest and disease management. Soil fertility is essential for the growth of both grass and legume crops. Legumes require specific soil nutrients, such as phosphorus and potassium, and require a neutral to slightly alkaline soil pH for optimal growth. Water availability is critical, especially during the establishment phase of the crops. Both grasses and legumes require sufficient water for growth, and drought stress can negatively impact crop yield. Climate also plays a crucial role in intercropping success, as different grass and legume varieties have specific climate requirements. Pest and disease management are also important considerations, as both grass and legume crops are susceptible to various pests and diseases.

Environmental Benefits of Grass-Legume Intercropping

Grass-legume intercropping provides several environmental benefits, including reduced soil erosion, improved soil quality, and increased biodiversity. The intercropping system reduces soil erosion



by providing year-round cover to the soil surface, reducing the impact of raindrops and wind on the soil. The legumes fix nitrogen from the atmosphere, reducing the need for synthetic fertilizers and reducing the negative environmental impacts associated with their production and use. The intercropping system also promotes biodiversity by providing a diverse range of habitats for different plant and animal species.

Challenges to Grass-Legume Intercropping

Despite the benefits of grass-legume intercropping, several challenges exist that can limit its success. These include competition for resources, weed management, and crop susceptibility to pests and diseases. The grass and legume crops often compete for soil nutrients, water, and light, which can negatively impact crop yield. Weed management is also critical, as weed growth can reduce crop yield and quality. The susceptibility of both grass and legume crops to pests and diseases can also limit the success of intercropping.

Future Research Directions in Grass-Legume Intercropping

Future research in grass-legume intercropping should focus on improving crop management practices to maximize yield and quality. There is a need for research on the effects of different intercropping methods on crop yield, soil fertility, and environmental benefits. In addition, research should focus on developing new grass and legume varieties with improved yield and disease resistance. Finally, research should aim to identify and mitigate the challenges associated with grass-legume intercropping to increase its adoption and promote sustainable dairy farming.

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