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Awareness Regarding Mulching Techniques in Vegetable Crop Production

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Mulching is an important agricultural practice that involves covering the soil surface around vegetable crops with organic or inorganic materials. It helps conserve soil moisture by reducing evaporation and improves soil temperature regulation. Mulching also suppresses weed growth, reduces soil erosion, and improves soil structure and fertility. Organic mulches such as straw, dry leaves, crop residues, and compost add nutrients to the soil after decomposition. Plastic and biodegradable mulches can provide effective weed control and improve crop growth and productivity. Awareness regarding proper selection, application, and management of mulch is essential for sustainable vegetable production. Farmers should be encouraged to adopt suitable mulching techniques according to crop, soil, and climatic conditions. Proper use of mulching can improve water-use efficiency, reduce production costs, and enhance the quality and yield of vegetable crops.

Keywords: Mulching; Vegetable Crops; Farmers' Awareness; Mulching Techniques; Sustainable Agriculture.

Introduction

Mulching is an important agronomic practice widely used in vegetable production to improve crop growth, conserve natural resources, and enhance productivity. It involves covering the soil surface around plants with organic materials such as straw, dry leaves, crop residues, and compost, or inorganic materials such as black polyethylene sheets and biodegradable films. In vegetable cultivation, mulching helps maintain optimum soil moisture by reducing evaporation, suppresses weed growth, regulates soil temperature, minimizes soil erosion, and prevents nutrient loss. It also keeps fruits clean by reducing direct contact with the soil, thereby lowering the incidence of soil-borne diseases and improving market quality. Furthermore, mulching enhances water-use efficiency, promotes better root development, and contributes to higher crop yield and profitability. Owing to these advantages, mulching has become an important component of modern vegetable farming and sustainable agricultural practices, particularly in water-limited regions such as Chhattisgarh.

Awareness among Vegetable Farmers Regarding Mulching Techniques

The assessment of awareness regarding mulching techniques among vegetable farmers indicated that awareness varied depending on farmers' educational background, extension contact, and farming experience. Farmers who had participated in training programmes or interacted regularly with agricultural extension personnel demonstrated a better understanding of the purpose and advantages of mulching than those who relied solely on traditional farming practices. Most farmers were aware that mulching helps conserve soil moisture, suppress weed growth, and improve crop productivity. However, awareness regarding advanced aspects such as biodegradable mulches, appropriate mulch colour selection for different vegetable crops, proper installation methods, and environmentally safe disposal of plastic mulch was

comparatively limited. Farmers who had adopted drip irrigation were generally more familiar with the combined use of mulching and efficient irrigation practices. The findings suggest that although awareness of the basic concepts of mulching is increasing, there is still a need to strengthen farmers' technical knowledge through regular training programmes, field demonstrations, exposure visits, and extension activities. Enhanced awareness is likely to improve the adoption of scientifically recommended mulching practices, thereby increasing water-use efficiency, reducing production costs, and improving vegetable yield and quality.

Adoption of Different Types of Mulching Materials Used in Vegetable Production

Vegetable farmers possessed varying levels of knowledge regarding different types of mulching materials used in vegetable production. Most respondents were familiar with commonly used mulches such as black polyethylene mulch and organic mulches, including paddy straw and crop residues, owing to their wider availability and frequent promotion by extension agencies. However, knowledge regarding advanced mulching materials such as silver-black polyethylene mulch, biodegradable mulch films, and photo-selective mulches was comparatively low. The adoption pattern indicated that black polyethylene mulch was the most widely adopted because of its effectiveness in weed control, soil moisture conservation, and yield improvement. Organic mulches were mainly adopted by small and marginal farmers owing to their low cost and easy availability, whereas the adoption of biodegradable mulch remained limited because of its higher cost, limited market availability, and inadequate technical awareness.

Benefits and Constraints Perceived by Farmers in the Use of Mulching Techniques

Vegetable farmers perceived mulching as a beneficial technology that improves both crop performance and farm profitability. According to the farmers, the most important advantage of mulching was its ability to conserve soil moisture, which reduced the frequency of irrigation, especially during dry periods. Many farmers stated that mulching helped control weed growth, thereby reducing labour requirements and the cost of manual weeding. Farmers also observed that vegetables grown under mulch produced better-quality fruits, experienced earlier harvesting, and generally yielded higher production than crops grown without mulch. They further reported that mulching protected the soil from excessive heat, reduced nutrient loss, minimized soil erosion, and kept fruits clean by preventing direct contact with the soil. However, despite these advantages, farmers also expressed several constraints that limited the wider adoption of mulching. The major problems reported were the high cost of plastic mulch, inadequate availability of quality mulching materials in local markets, and insufficient technical guidance on proper installation and management. Small and marginal farmers felt that the initial investment required for plastic mulch was beyond their financial capacity. Farmers also highlighted difficulties in the collection and disposal of used plastic mulch, which created environmental concerns. In addition, some respondents mentioned that damage caused by livestock, strong winds, and improper installation reduced the effectiveness of mulching.

Suitable Measures for Enhancing Awareness and Adoption of Mulching Techniques among Vegetable Farmers

Vegetable farmers suggested several practical measures to improve awareness and increase the adoption of mulching techniques in the study area. Most farmers emphasized the need for regular training programmes, field demonstrations, and village-level awareness campaigns to gain practical knowledge about the correct use of mulching materials. According to the respondents, observing the performance of mulching technology in demonstration plots increased their confidence and encouraged them to adopt the practice on their own farms. Many farmers also recommended that the Department of Horticulture, Krishi Vigyan Kendras (KVKs), and Agricultural Universities should organize hands-on training on the selection of suitable mulch materials, installation techniques, irrigation management, and safe disposal of

plastic mulch. Farmers expressed that the high cost of plastic mulch was one of the major barriers to adoption; therefore, they suggested increasing government subsidies and ensuring the timely availability of quality mulching materials through local input dealers and cooperative societies. Several respondents also recommended easy access to institutional credit and financial assistance, particularly for small and marginal farmers, to reduce the initial investment required for mulching. In addition, farmers suggested strengthening extension services through regular farm visits, mobile-based advisory services, WhatsApp groups, and distribution of technical literature in the local language to improve awareness and provide timely guidance. They also highlighted the importance of promoting biodegradable mulches and locally available organic mulching materials, which are environmentally friendly and suitable for sustainable vegetable production. Scientifically, these measures are expected to improve farmers' knowledge, reduce production costs, enhance water-use efficiency, suppress weed growth, conserve soil moisture, and increase vegetable productivity while minimizing environmental pollution caused by plastic waste.

Plastic Mulching Demonstration on Crops