

Conservation Agriculture (CA)

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Summary:

Conservation agriculture (CA) is an agricultural approach that emphasizes plant species diversity, minimal soil disturbance and preservation of permanent soil cover. This method aims to enhance biodiversity and biological activities in the soil to sustain crop yield while improving water and fertilizer efficiency. CA principles include minimum soil disturbance, permanent soil cover and species diversification. Adoption of CA offers various benefits including economic gains, agronomic improvements and environmental preservation such as soil erosion reduction and carbon sequestration. However, challenges remain in promoting widespread adoption. Nevertheless, the adoption of CA holds significant potential to enhance farm productivity, reduce input costs and increase resilience to climate change, thus creating a more sustainable agricultural sector. Collaboration among governments, NGOs and stakeholders is essential to overcome adoption challenges and promote CA adoption globally.

Definition:

Conservation agriculture is a type of farming that encourages plant species diversity, preservation of a permanent soil cover and minimal soil disturbance or no tillage. Enhancing biodiversity and naturally occurring biological activities both above and below the ground surface helps to boost and sustain crop yield by increasing the efficiency of water and fertilizer usage. (FAO)

Introduction:

A farming method called conservation agriculture (CA) can restore damaged areas while preventing the loss of arable land. It encourages the diversity of plant species, little disturbance of the soil and preservation of a permanent soil cover. Enhancing biodiversity and naturally occurring biological activities both above and below the ground surface helps to boost and sustain crop yield by increasing the efficiency of water and fertilizer usage. All agricultural landscapes and land uses with locally adapted practices can benefit from the use of CA principles.

External inputs such as agrochemicals and plant nutrients with mineral or organic origin are applied optimally, in amounts and methods that do not interfere with or disturb the biological processes and soil interventions such as mechanical soil disturbance are minimized or completely avoided. For rainfed and irrigated crops, CA enhances total land husbandry and makes good agronomy—such as timely operations—possible. CA serves as a foundation for sustainable agricultural output intensification when combined with other well-known best practices, such as the use of high-quality seeds and integrated pest, fertilizer, weed and water management. It creates more opportunities for the integration of production sectors, including the integration of grasslands and trees into agricultural landscapes and the integration of crops and cattle.

Three principles of Conservation Agriculture:

1) Minimum mechanical soil disturbance

(i.e. no tillage) through direct seed and/or fertilizer placement.



Figure 1

2) Permanent soil organic cover

(At least 30 percent) with crop residues and/or cover crops.



Figure 2

3) Species diversification

Through varied crop sequences and associations involving at least three different crops.

■ www.justagriculture.in

**Figure 3****Benefits of Conservation Agriculture:**

All new technology must appeal to a wide range of farmers who recognize the distinctions between what they are doing and what they require in order to be broadly adopted. These advantages of conservation agriculture can be categorized as follows:

Gains in production efficiency from an economic standpoint

The adoption of CA may have three main economic benefits:

- Saving time and lowering the need for labor.
- Reduction of expenses, such as fuel, maintenance and operating costs for machines and labor costs.
- Greater efficiency can be defined as producing more with a smaller input.

Agronomic benefits that improve soil productivity

Taking up conservation Agriculture increases the productivity of the soil

- The amount of organic matter grows.
- Conserving water in the soil.
- Enhancement of the rooting zone and soil structure.

Advantages for the environment that preserve the soil and increase the sustainability of agriculture

- Decrease in soil erosion and thus lower maintenance costs for roads, dams and hydroelectric power plants.
- Enhancement of the quality of water.
- Enhancement of the quality of the air.
- Biodiversity increase.
- Sequestration of carbon.

Conclusion:



Adoption of conservation agriculture has significant potential to enhance farm productivity and profitability, reduce input costs and enhance resilience to climate change. Governments, NGOs, and other stakeholders need to work together to address the challenges of adoption and promote the widespread adoption of conservation agriculture. By doing so, we can help create a more sustainable and resilient agricultural sector that benefits both the environment and the economy.

References:

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