

Conservation Agriculture for Sustainability under Water Scarcity

Problem

In drylands, much of the rainfall is lost to evaporation, and the problem of water availability is compounded by low and irregular rainfall. Regions with excessive tillage in addition have a high risk of water loss through erosion, reduced infiltration, and a greater evaporation rate. Maintaining crop production and stable crop yields in these regions is a major challenge for farmers.

Solution

Conservation agriculture (CA) with its three principles of soil cover, diverse crop rotations and no soil disturbance, has been promoted as an alternative for dryland areas. CA improves soil structure and soil organic matter content, thereby increasing water infiltration and reducing the amount of water loss through evaporation and erosion. This results in an increased water availability for crops, higher yields, and lower production costs.

Applying conservation agriculture in practice

- Purchase or rent a no-till drill that is capable to plant in uncultivated soil.
- If you think fallow is necessary for stable production in your location, leave 25% of the land fallow and plant 25% with legumes and 50 % with grains. In the following years, the fallow can be eliminated as benefits of CA appear.
- Include legumes in the crop rotation to increase yields and soil nitrogen and enhance system productivity.
- When first applying CA, start cultivating post-grain legumes to improve soil structure and fertility.
- Apply herbicides if the fields are covered with a high density of weeds before planting.
- Let the shepherds know about the places where you planted to reduce livestock herd grazing on crops.
- Leave the harvested stubble as evenly as possible on the field surface.
- Apply a pragmatic approach to CA and adjust CA principles to local environmental and social conditions. For example, when facing difficulty with managing weed with herbicides, reduce tillage can be an alternative. Also, while livestock grazing goes against the CA principles, grazing for a certain time can be closer to farmer realities.



Picture 1. A no-till mechanical seed drill.
(Photo: İrfan Gültekin)



Picture 2. Wheat emergence in a no-till field
(Photo: İrfan Gültekin)

Further information

In English:

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- Arisoy, R. (2023). DOĞRUDAN EKİM SİSTEMİ. <https://arastirma.tarimorman.gov.tr/bahridagdas/Belgeler/Teknik%20Bilgiler/dogrudan%20ekim%20sistemi.pdf>
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About this practice abstract and ConServeTerra

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Project website: <https://conserveterra.org/>

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