

Optimum stubble management strategies for better crop-livestock integration under conservation agriculture

Problem

Most of the areas under CA in North Africa are located in semi-arid regions under rainfed conditions. Production systems in these regions are mainly based on field crops and especially cereals production (wheat, barley, and oat) combined with ruminant livestock. In addition, CA farmers usually combine cereals crops with livestock activities and give preference to their livestock as these are usually the primary source of income and a form of asset. These farmers face major constraints in terms of permanent land cover since farmers allow their livestock to graze on stubbles after harvest. Therefore, under the CA system retaining crop residue allows creating a conflict of interest exists between mulch for covering soil surface and stubble grazing, especially during the summer period.

Challenges

Trade-offs between the use of stubbles for livestock feeding or to cover the soil must be reduced, particularly in drylands where fodder potential is low. For better crop-livestock integration under CA, it is necessary to combine diversified crop rotation with controlled and improved managed grazing. This can be effective at preserving or even enhancing soil function and health.

Solution and practical recommendations

One of the activities in the project is to determine optimum stubble management strategies that allows a permanent soil cover, while leaving enough organic matter to provide nutrients and soil carbon for the following crop. Based on the project results, practical recommendations on the optimum stocking rate of sheep that allows to leave sufficient residues on the soil surface to enhance agronomic performances for the following crops can be formulated:

A **stocking rate of 30 sheep/ha for 30 days** was found to be the **optimum stubble management strategy**, which allows to leave between 62 % to 82 % (**mean of 70 %**) of residues on the soil surface compared to the total residue left in the soil before grazing. With the recommended stocking rate, the **agronomic performance of crops was the same** than prohibiting livestock to graze on stubbles (i.e. leaving all residues on the soil) and residues left on the soil surface using a stocking rate of 15 sheep/ha.



About this practice abstract and ConServeTerra

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

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