



Central Asian Countries Initiative for Land Management

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ARTICLES

Minimum tillage: a cost-effective solution for drylands agriculture

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Minimum tillage is a proven means of raising productivity in dryland regions, helping to eliminate soil compaction and reduce the evaporation of moisture and CO₂. It is also cost effective, significantly reducing the fuel consumption costs associated with plowing. As a result, the practice is being promoted across the semi-arid regions of Central Asia where low annual rainfall is a persistent constraint on agricultural productivity.

Applying minimum tillage immediately after harvest creates an even and loose field cover without inner capillaries through which moisture can quickly evaporate. Research has demonstrated that the productive moisture reserve at a depth of 10-12 cm can be 30 percent higher in comparison to soil preparation by conventional plowing, which helps to increase germination rates.

Through the application of minimum tillage, the activity of subterranean micro fauna – including earthworms and beetles – improves, and there is no need to even the soil, which reduces tillage and the associated fuel, lubricant and labor costs.

Success in Central Asia

In Central Asia, the practice has already been applied in four countries with significant success: Kazakhstan, Kyrgyzstan, Uzbekistan and Tajikistan. In Kyrgyzstan, the technology was utilized through a Turkish seeder, CBP-2.8, which forms beds, sows, and simultaneously cuts furrows to irrigate between the beds.

This bed-planting technology creates optimal conditions for agricultural crops and provides effective furrow irrigation, which prevents the excessive use of irrigation water – saving some 25-30 percent – and can ease 'irrigation erosion,' when flooding methods are used during the cultivation of certain crops, such as corn.

Practical application

Prior to, or shortly after irrigation, a tractor or appropriate agricultural machine should move along irrigation furrows to apply herbicides and pesticides. The bed-planting of cereals can be implemented on

Project Purpose

Acting as an information repository and knowledge hub, this website helps to increase the use of innovations developed by the well-established CACILM Project in Central Asia. Its synthesis, compilation, and dissemination of current research provide a secure knowledge base that policymakers and other stakeholders can access and utilize to develop sustainable strategies capable of addressing the region's severe land degradation.

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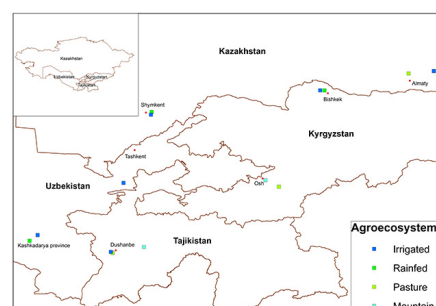
Visualization of technologies



TECHNOLOGIES

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DEMO PLOTS



In addition to cereals, bed-planting can be used for growing vegetables and legumes, as well as industrial and oil crops, including: sugar beet, rape, soya bean, and sesame.

Evading potential problems

The technique is not without risks: weed infestation may increase during the first year of application. However, with the right strategies, these problems can be avoided. For instance, the optimized use of herbicides can help to avoid potential infestation during the first year of the technology's application; and the optimized use of pesticides can help avoid the destructive activity of pests, as can the application of crop rotation, mechanical weeding, and the certified use of seed.



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