

Technology Fact Sheet

Sector	Agricultural Soils
Technology name	Mini-Till soil cultivation system with use mineral fertilizers and of vegetal waste (straw, cobs, etc.) as fertilizerⁱ Budoï G., Penescu A. Agrotehnica. Sistemul minim de lucrare a solului. București: Cereș, 1996, p. 330-332. Resturile Vegetale de la Culturi. București: Cereș, 2005, p. 485-487.
CO2 Emissions in „Agricultural Soils” sector, tons CO2	In 2010 – 3 000 787 t or 2,07 t/ha (sown areas – 1 451 500 ha, fallow lands = 1 820 510-1 451 500 = 369 010 ha; on fallow lands the emissions were well balanced or slightly positive)
General description of the technology	According to the Banaru A. paper "Method of determining the carbon balance in agricultural soils of Moldova to assess CO2emissions" (Ch., 2000), 1q of dry mass of the crop provides 1. 0q/ha of vegetal waste during straw evacuation, 43q/ha during straw incorporation in the soil. So, the incorporation of straw into the soil provides for additional 0.43 q/ha of vegetal waste containing 40-45% carbon and 0.05 - 0.08% nitrogen (Mihai Rusu. Agrochemistry Treaty, tab 5100, p.485.) Humification coefficient of the straw incorporated into the soil is 0.11. So, the result of using straw as fertilizer after harvesting - standard 3t/ha of the main crop, is accumulation in the soil of 1.3 t / ha of vegetal waste which will synthesize 1.4 q of humus and remove 83 kg of carbon, which help reduce additional CO2 emissions from agricultural soils by about 3q/ha or 0.3 t / ha.
How the technology will be implemented and disseminated across the sector?	This technology can be successfully implemented by all farm businesses on cca 20-25 percent of agricultural lands (cca 200 000 ha), primarily for cultivation of grain crops. Implementation of this technology will require a combined drill tillage with light discs and a common sowing machine, or combined tillage and sowing machine (Annex 10).
Implementation barriers	Machinery that would chop and uniformly distribute the vegetal waste on the soil's surface are needed; The compact layer can be periodically (once in 2-3 years) loosened by using a chisel type loosener or Pinocchio type aggregate (Annex 9).
CO2 reduction as a result of technology implementation , tons CO2	The technology may be applied on cca 200 thousand ha of areas sown with grain crops, what will lead to reduction of CO2 emissions by cu 0.3 t/ha x 200 000 ha = 60thousand tons CO2.
Impact – Impact of the technology on the country development priorities	
Impact of the technology on the country social priorities	As a result of using straw as fertilizer, the yields will increase by 1q/ha/year grain units, thus somewhat reducing the rural population poverty.
Impact of the technology on the country economic priorities	Increase of yields by 1q/ha/year grain units will ensure o benefit of \$25/ha/year or \$5 mln/year on the potential area of 200 000 ha.
Impact of the technology on the country environmental priorities	Annually, the straw from 200 000 ha of land are burned. This operation damages the soil and its biota. Using straw as fertilizer would displace this negative practice.
Other impact	Carbon emissions will reduce, the soil structure will improve.
Costs	
Investment costs	Investment costs for 1ha – \$222 once in 10 years or \$22.2 / ha/ year. For 200 000 ha - \$44.4 mln once in 10 years or \$4.44 mln /year
Operation and maintenance costs	Operation and maintenance costs amount to \$320 /ha/year or \$64 mln /year for 200 000 ha.
CO2 reduction cost	CO2 emissions will be reduced by 60 thousand tons on the area of 200000 ha

	cultivated according to this technology. CO2 reduction cost - 60 000 t x \$30 = \$1.8 mln per year.
Technology lifetime	Gradually this technology will be improved by employment of methods allowing to increase the inflow of organic matter in soil.
Other	Benefits will increase by \$25/ha/year or by \$5mln for 200 thousand ha.

ⁱ This fact sheet has been extracted from TNA Report - Technology Needs Assessment for climate change mitigation - Republic of Moldova. You can access the complete report from the TNA project website <http://tech-action.org/>