Technology Fact Sheet

Sector	**Agricultural Soils**
Technology name	**The classic tillage (plowing 20-35cm deep with moldboard plow (Annex 1), with cutting and turning within a crop rotation with 50% weeding crops) without application of organic fertilizers**[i] Neonila Nicolaev, B. Boincean. Agrotehnica. Bălţi, 2006. P. 225-230.
CO2 Emissions in „Agricultural Soils" sector, tons CO2	**Year 2010 – 3 000 787 t or 2.07 t/ha** (sown area – 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	At present classical (conventional) tillage is the most commonly used both in Moldova and worldwide. It implies as a must the moldboard plowing (Annex 1) by cutting and turning the furrow. Plowing regulates the water, air, nutrients and heat regime. Advantages of this technology are: *common tillage habits; total incorporation vegetal waste, weeds and their seeds*; *reliability due to simple construction of the plow; soil loosening effect (intensive mobilization of soil fertility, etc.* **Disadvantages:** *Damage of the soil's natural structure and catastrophic decrease of the topsoil's resistance to compaction; strong compaction of the post-arable layer situated under the recently plowed layer; considerable dehumification of the topsoil ; increased erosion on slopes ; high costs of plowing; negatively marked balance of carbon in soil; large CO2 emissions from soil.*
How the technology will be implemented and disseminated across the sector?	However, the total abandonment of the classical soil cultivation system with moldboard plow is impossible as some crops require mandatory plowing (beets, potatoes, vegetables). Such crops require areas of about 200 000 ha. Such areas, if cultivated in conformity with classical system, allow for application of manure that pollute the countryside, which would reduce CO2 emissions from agricultural soils and improve the environment in rural settlements.
Implementation barriers	Do not exist. In terms of application of manure on plowed areas, the barriers are the following. Currently there are no large farms and cattle herd is concentrated in rural households. In order to use manure as fertilizer municipalities need to organize the collection, depositing, fermentation and storage of manure on special platforms (Annex 2). Processing technologies and introduction of manure in the soil are provided in specially developed recommendations (Organic Fertilizers User Guidebook. Ch Pontos, 2012.115p). Realistically, the manure reserves do not exceed **2 - 3 million tons**, which would be sufficient to fertilize annually only 200 thousand ha of agricultural land, if collected (unfortunately, much less is actually collected).
CO2 reduction as a result of technology implementation , tons CO2	There are no CO2 reductions as a result of technology implementation. To ensure CO2 balanced emissions from plowed agricultural soils, it necessary to introduce about 10 t / ha of manure with bedding yearly.
Impact – Impact of the technology on the country development priorities ii	
Impact of the technology on the country social priorities	Ensures minimal welfare of rural population
Impact of the technology on the country economic priorities	Largely ensures food security of the country and provides for the agricultural products export needs.
Impact of the technology on the country environmental priorities	The technology leads to intensification of topsoil degradation processes, wasteful use of reserves of water in the soil and increases the risk of pedologic drought in the topsoil during dry years.
Other impact	Technology creates prerequisites for efficient use of manure that accumulates in rural settlements and pollutes the environment and groundwater. For this purpose

	it is necessary to build at least 40-50 inter-communal platforms for collection, processing and storage of manure from farms (Annex 2).
Costs	
Investment costs	For 1ha - **$ 222 once in 10 years or $ 22.2 / ha / year**. For 200 000 ha - **$44.4 million** once in 10 years **or $ 4.44mln / year** (for purchasing of the necessary equipment, Annex 3, tab. 2-3).
Operation and maintenance costs	For 1 ha - **$390 / ha / year. For 200 000ha = $79.2 million / year**. (Annex 3, tab. 2-3).
CO2 reduction cost	No reductions
Technology lifetime	In Moldova on cca 200 000 ha this technology will last forever. At present classical tillage is used on cca 0.8-1 mln ha.
Other	The yield od grain ensured by this technology is cca 3t/ha/year. Cost of grain produced on 1 ha = 3t/ha/year. **$**250 **= $750 /ha/year.** Total annual costs = 22+396 = 418 **$/ha/year. Total benefit = 750-418 = $332 /ha/year or $66.4 mln /year** on 200 000 ha allocated for classical tillage. **This technology will be used as standard for the purpose of comparing other technologies used on whole profile soils (not eroded soils).**

[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/**