Technology Fact Sheet

Sector	Agriculture
Adaptation needs	The classical soil cultivation system generated the phenomena of soil features degradation. Excessive plowing favored dehumification, damage of the soil structure, increased compaction, danger of erosion. It became necessary to develop new tillage systems known as “soil conservation works systems, SCWS". Mini-till and No-Till systems turned out to be the most effective. It is proposed to improve these two systems by including vetch as successive crop for green fertilizer.
Name of technologies	**Mini-till system and vetch as successive plant** [i]
How this technology contributes to adaptation	A crop of vetch (about 6 t / ha of dry weight containing 4% of nitrogen), and roots (about 4t/ha dry weight containing 2% of nitrogen) accumulates about 10 tons of organic matter in soil, which ensures synthesis of about 2.5 t / ha of humus containing about 200kg of nitrogen. This amount of humus is sufficient to create a positive carbon and nitrogen balance in soil during 2 years. The arable layer will become structured, loose, will contribute to a favorable air-fluid and nutrients regime and will increase the plants resistance to drought. Technology (large scale / medium-long term implementation)
Short description of the technology option sourced from ClimateTechWiki.	This technology contributes to environmental friendliness of agriculture, creating a positive balance of humus and soil carbon, return of about 200 kg of nitrogen into soil, of which 50% are of symbiotic origin, reduces the risk of reduced yields due to climate change.
How this technology will be implemented and spread across the sector?	This technology can be successfully implemented on 50 percent of agricultural lands. Vetch, as a successive crop used as green fertilizer, shall be sown once in two years after harvesting spiked cereals. Implementation of this complex technology requires vetch seeds production operation. The autumn vetch shall be planted, as appropriate, in late August or early September.
Costs	The costs for including vetch as successive crop used as green fertilizer under the mini-till soil cultivation system are worth 85 € / ha for 2 years or 43 € / ha / year. Summary costs for tillage stubble-turning, weed control, disc harrowing, seedbed preparation, sowing of the basic crops and post sowing compression are 70 € / ha / year.

Country social development priorities	This technology ensures a long-term preservation of soil fertility - the main means of production of the country, protects the land from desertification processes entailing impoverishment and migration of population, creates economic prerequisites for replacing the existing system of subsistence agriculture with sustainable agriculture based primarily on employment of natural processes, biological and renewable resources and only secondarily - purchased resources. Preserved internal resources, the soil with its characteristics, water, biodiversity, etc., are a prominent feature of sustainable agriculture and subsequently, of combating land degradation and desertification.
Country economic development priorities (economic benefits)	The crop growth over the whole period of vetch green mass action (2 years) is 1t/ha cereal units or 200 € / ha / year in monetary terms. The net benefit is € 115 / ha / year. If applied regularly, this technology contributes to a positive balance of soil carbon, excludes CO2 emissions, reduces the need to purchase and apply nitrogen fertilizers by 80-90 percent.
Country environmental development priorities (environmental benefits)	It stops soil degradation, makes the humus and soil carbon balance positive or well-balanced, cardinally improves the soil biota status, increases resistance of soil to pollution and of plants to drought, agricultural products become ecologically cleaner.
Social benefits	The social - economic effect of this technology implementation will be the following: it will increase the turnover and quality of agricultural production on arable soils, wellbeing of rural population, and decrease migration.
Other considerations and priorities	The agricultural production process becomes more environmentally friendly.
Capital (investment) costs	It is necessary to purchase an organic waste chopper similar to the ones manufactured by Lemken - worth 20 thousand € and a combined drill tillage and sowing machine worth € 50 000, in total 70 thousand €.
Operational and maintenance costs	Expenses for organizing the vetch seed production process or purchase are 85€/ha/2 years or 43€/ha/. These expenses are included in the cost of technology. Costs for tillage stubble-turning, weed control, disc harrowing, seedbed preparation, sowing of the basic crops and post sowing compression under the mini-Till soil cultivation system are worth 70 € / ha / year. Total operational costs - 113€/ha/year. Implementation area-200 000 ha. Total operational costs-32 600 000 euro.
Growth potential	The weight of this technology on the market will grow along with environmental friendliness of agriculture based on natural processes.

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