Constructive changes in pneumatic and mechanical sowing machines for a water flowing surface irrigation system

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In the framework of the activities related to “Rationalization of Ras el Ein irrigation systems in Syria” cooperation program (Donor: Italian Foreign Affair Minister, Cooperation & Development head office. Executor: Centre International d’Hautes Etudes Agronomique Méditerranée, Agronomic Mediterranean Institute, Bari), to improve the efficiency of a water flowing surface irrigation system, some constructive changes in pneumatic and mechanical sowing machines have been done.

In the project area in Ras el Ein, normally a water flowing surface irrigation is practised with notable loss of water and use of a lot of manpower, without any control on the quantity of water, approaching itself more to a submersion that brings to the collapse of the soil structure and to the progressive saltiness; besides some pumping stations of the Kabur river that flows in this part of the Mesopotamia will be collapse yet.

From such problem list it is born the need of saving water, that has brought the project to the experimentation and popularization of some irrigation systems among which a simple water flowing surface irrigation system. This system, that can be produced on the spot with simple materials - also them produced on the spot-, allows to have a lower price irrigation system, easily repairable, with a lower maintenance cost, manageable, with easy management of the water quantity; it brings to a saving from 35% to 50% in comparison to the systems traditionally used in the area.

Nevertheless, the system requires that the field is worked in ways by to form some furrows, then water adducent pipes, without jeopardizing the good result of the seeding. Then it needs to modify the sowing machine so that to predispose the adducent furrows, and, contemporarily, to effect the sowing.

Particularly, on purpose have been designed and realized “on the spot” some working parts, added to the basic loom. For the mechanical sowing machine, used for wheat, in front of the machine, studying the profile and the angle of entry, have been added two coulters to enable opening the furrows and the sowing at the same time; behind the machine, to press the soil closely together in the opened furrow, two rollers have been studied in design, weight and position.

Instead, for the pneumatic sowing machines, used for cotton, maize, sunflower and soybeans, in front of the loom, to open the furrows two coulters have been added; at the back of each, to press the soil closely together in the furrow at the beginning of planting, a mobile base pressed by a spring have been installed. Many shapes of this blade were tested to get the suitable shape of the furrow in depth, width and sides to cover and embrace the seeds.