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Limiting Factors in the Adoption of Conservation Agriculture in Rice Cultivation in Cuba

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Opinion

In Cuba, rice is the most common food in the Cuban diet, with a national demand of 700 thousand tons and an average consumption rate of more than 70 kg per person per year. However, domestic production only guarantees 40 percent of that demand, so the country is forced to import more than 400,000 tons of rice annually [1]. Worldwide, soil preparation for sowing irrigated rice cultivation is carried out depending on the conditions where it is grown, the plant establishment technique and mechanized resources. But conventional tillage based on the use of plows, harrows, wheels and puddle rollers has been the usual method in most rice production systems in the world [2,3]. A viable alternative for the development of rice cultivation may be the adoption of conservation agriculture (CA), although the full benefits of CA take several years to fully manifest. However, in Cuba, the implementations of CA principles indicate that the main limiting factors in rice production are:

- a) The influences of the manifestations of climate change.
- b) The use of non-conservationist agricultural practices, based on inadequate technologies and implements such as disc harrows and puddle wheels.
- c) Poor soil preparation: All the machinery required for soil preparation is not available, which causes failure to comply with the provisions of the Technical Instructions for Rice Cultivation.
- d) Insufficient availability of water. The low efficiency in the use and management of water, together with periods of drought, as a result of climate variations, limit the availability of stored water for planting.
- e) Poor leveling of the fields. Maintenance tasks and correction of the surface level are not carried out, because there is not enough equipment.
- f) Low soil fertility expressed in low nutritional levels (organic matter, assimilable phosphorus and potassium) and effects on the physical properties of the soil, characterized by an increase in apparent density and a decrease in total porosity.
- g) Bad driving. The lack of crop rotation in most of the planted area, repeating the monoculture of rice.
- h) Incidence of pests (arthropods, diseases, weeds, cattle, rodents, among others).

In this context, the use of new alternatives that are economically more viable, more efficient in weed control and at the same time capable of maintaining or even recovering the physical state of the soil is of particular interest. Among these alternatives, conservation agriculture stands out, a widely spread practice in the world and that has begun to gain acceptance in rice cultivation.

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