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Evaluation of Agrobiodiversity and its Effects on the Sustainability of a Wheat-Cotton Cropping System in Iran

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Abstract

Biodiversity which is a necessity of sustainable agriculture can provide species that can act as natural enemies for biologic control or genes for increasing crop resistance to biotic and abiotic stresses. Improvement of biodiversity by introducing crop species which have functions similar to off-farm inputs, reduces agroecosystem dependency and increases its self-sufficiency and sustainability. In order to evaluate the agrobiodiversity of a wheat-cotton cropping system and its effects on ecological sustainability, a survey was conducted in Khorassan province (eastern part of Iran). Agrobiodiversity indicators were growing other crops than wheat and cotton, planting forage legumes, green manure and livestock presence and diversity in the farm. The data were collected from Neyshabour, Bardaskan and Ferdows using 518 questionnaires. Results showed that only 7.9 and 1.4 percent of farmers grow forage legumes and green manure, respectively. 78 percent of farmers grow at least one other crop than wheat and cotton. 47.5 percent of farmers have one or more kinds of livestock in their farms which are mainly considered for family consumption. Results also proved a significant correlation of all agrobiodiversity indicators with ecological sustainability in this cropping system. The present study showed that improving sustainability of wheat-cotton cropping systems through enhancing agrobiodiversity in Iran needs a multidimensional struggle by farmers, researchers and policy-makers in which researchers should conduct experiments in order to determine suitable plant species and cultivars for introducing to these farming systems as forage legume or green manure. Second, education and extension attempts should be done to make farmers familiar with several benefits of forage legumes and green manure and agronomic practices for their production. Finally, policy-makers should facilitate the atmosphere by supporting smallholder farmers in introducing new crops and animal husbandry through financial support, providing machinery and education as well as subsidy to pioneer farmers.

Keywords: Agrobiodiversity, forage legumes, livestock, sustainability