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Participatory Maize-Legume Experimental Trials as a Tool to Explore Social-Ecological Niches for Innovation Adoption in Small Scale Farming Systems

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Abstract

Maize-legume mixed cropping is essential part of the farming systems in the mid-hills of Nepal. However, its productivity remains low. The low adoption of innovations are among the causes that condition the yield improvement of the systems. Therefore, we performed two years participatory on-farm trials with maize-legume crop combinations under best-bet management to determine their productivity, and the farmers' reasons of low innovation adoption. We also tested whether providing more information about innovations would influence farmer perceptions. Maize yielded on average 7 Mg ha^{-1} in the intercrop, in comparison to 2 Mg ha^{-1} under farmer practice. The intercrop under best-bet management showed higher land use efficiency and economy return. We involved farmers on field discussions during the duration of trials. In addition we assessed, by using a board impact tool, their perceptions about 1) technologies tested (mini-tiller, hybrid seeds and chemical fertilisers), and 2) improved cropping practices (optimal plant population in row arrangement). Farmers initially expected a high demand of labour for both row seeding and mini-tiller use before the trials, but this was adjusted to lower anticipated labour demand after the participatory trials. In contrast, the perception of high investment costs for both innovations persisted. By the second year of trials there was a relatively large percentage (17%) of farmers that partially adopted the improved seeds and row seeding, the reasons for the non-adopters were the preference to consume local varieties and high labour at planting time for the row arrangement. The use of a mini-tiller was low (3%) due to the low availability and the difficulty to take it to remote fields. The adoption rate of chemical fertilisers was low, because most of the households perceived the quantity of FYM they produced as sufficient, and perceived a risk of damaging soil if using chemical fertilisers without proper rainfall. Most of the early adopter farmers belonged to a medium to high resource endowment type and high caste. Our study shows that the participatory on-farm trials were effective to explore perceptions and preferences of farmers, and it increased understanding on targeting of innovations to achieve sustainable intensification in the mid-hills agroecosystems.

Keywords: Farmers perceptions, innovation adoption, maize-legumes inter-crops, participatory trials, small farming systems