University of Hohenheim

Institute of Agricultural Sciences in the Tropics (Hans-Ruthenberg-Institute)
Section Agronomy in the Tropics and Subtropics (490e)

Master thesis

Study Program: Crop Sciences

Potential of maize-common bean intercropping: A review and a case study from the Philippines

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Day of submission: 26th September 2016

This work was financially supported by the Foundation fiat panis.

Abstract

In a literature study and a case in the Philippines, the potential of maize-common bean intercropping (MBI) was evaluated. The case study included sole and intercropping of maize, bean, squash. Also compost and compost tea were applied. Additionally, literature from 1982 to 2015 was analyzed. From 33 found papers, 12 could be used. There, the effect of different influencing factors on maize and bean yield was analyzed and discussed. MBI is stated to be more suitable in low input systems. But research was mainly done under high input conditions. Consequently, results of the papers used in the literature study are less applicable for small scale farmers. Nevertheless both, researchers and small scale farmers payed emphasis on maize as staple crop, accepting lower bean yields. Main problem in low-developed countries seem to be lack of knowledge and therefore soil degradation. MBI seems not to be suitable to increase soil fertility, but maintains it. To restore soils, organic matter has to be incorporated as well as high-nitrogen fixing species like *Sesbania sesban*. Common bean seems to be more suitable in higher latitudes and altitudes. Therefore, it may be better to replace it in lower latitudes and altitudes by other species, like cowpea. Anyway, MBI is a promising combination counteracting malnutrition. Breeding for low input open-pollinated varieties would be desirable. Crop management and breeding strategies are meant to increase light transmission ratio and therefore could increase bean yield. The case study failed. Likely due to not-adapted bean variety. Furthermore, compost was applied too late.

Keywords: Intercropping; *Phaseolus vulgaris*; potential; soil fertility; *Zea mays*