Farming Systems Improvements in Different Regions

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Abstract

Small grain legumes form part of most cropping systems in the semi-arid regions of Zimbabwe. Legumes are normally grown in small areas and receive >5% of soil fertility inputs. However, if well managed, small grain legumes can improve the yield of cereal crops through soil fertility enhancement and the creation of a micro-climate around the cereal crops. Cereals are a staple for many African countries, e.g., maize in Zimbabwe. Enhancing the productivity of cereals especially in environments with many crop growth limiting factors can achieve food security for farmers. Semi-arid areas of Zimbabwe are characterized by low, erratic, and unreliable rainfall, and inherently infertile soils resulting in low crop productivity. Unfortunately, the majority of smallholder farmers in Zimbabwe are located in these semi-arid areas, hence many are vulnerable to food crises. Farmers rely on synthetic fertilizers for soil fertility improvement but these fertilizers are very expensive and unaffordable for many farmers, resulting in no or under application. This causes a further decline in soil fertility and crop productivity. Additionally, synthetic fertilizers degrade the soil quality and increase emissions of greenhouse gases (GHG), thereby contributing to climate change. Poor soil fertility in semi-arid areas causes food insecurity for farmers for the greater part of the year, even in years of good rainfall. Readily available and affordable strategies aimed at improving soil fertility and reducing the effects of drought in semi-arid areas are necessary. Cereal–legume rotations and intercropping have the potential to partially or completely substitute for the use of synthetic fertilizers without compromising yields. Nevertheless, the role of legumes in cereal productivity in semi-arid farming systems and their effects on cereal yields have been generalized. Generalization may result in inappropriate designs and management of intercrops and rotations, reducing the efficiency of legumes on cereal crop productivity. Therefore, this chapter looks at the role of marginalized small grain legumes in cereal–legume cropping systems in cereal productivity in the semi-arid regions of Zimbabwe.