

## **Closing the yield gaps of Ethiopian faba bean (*Vicia faba* L.) and common bean (*Phaseolus vulgaris* L.)**

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### **Abstract**

In Ethiopia, grain legumes are grown on 13% of the total grain crop production area and produce 10% of the yield. They provide nutritional security, sources of income for smallholder farmers and export commodities for the country. Farmers grow them either as a pure stand or in mixtures with other crops, with important roles in crop rotations. Faba bean and common bean are the two most important legumes, representing 33% and 17% of grain legume production in the country during the last decade. Since the start of crop breeding in Ethiopia in the 1960s, 34 improved cultivars of faba bean and 68 of common bean have been released, leading to huge improvements in crop productivity. Faba bean grain yield on smallholder farms has increased an average of 80 kg / ha over 10 years, and that of common bean by 60 kg / ha, but yields are still much lower than they could be. The components of the yield gap may be shown as follows: for faba bean, the average yield of a smallholder plot is 1.9 t/ha, whereas on-farm demonstration plots can yield 3.1 t/ha and experimental stations up to 4.1 t/ha. Similarly, the smallholder gets 1.5 t/ha of common bean, the on-farm demonstration plot 2.4 t/ha and the research station 2.9 t/ha. The best cultivars deliver a further 20% yield increase on these figures. There are many contributors to these yield gaps. The first step from average yield to demonstration-plot yield is attributable to improved agronomic practices that are accessible to smallholders. The second step to experimental-station yields probably requires greater investment in infrastructure for overcoming some of the biotic and abiotic stresses. Continued usage of unimproved landraces may be due partly to the cost of seed of improved cultivars and partly to eating quality and other culturally important aspects of the crops not prioritized in breeding programmes that focus on yield and stress resistance. Farmer participatory research in the Horizon2020 project “InnoFoodAfrica” will help to dissect these components of the yield gap and to indicate potential pathways to solving them.

**Key words:** Faba bean, common bean, yield gap, Ethiopia