Crop yields in sub-Saharan Africa are significantly lower than global averages. For maize, rice, groundnuts, and sorghum, yields in sub-Saharan Africa are one-third to one-half of the global average. Average yields obtained by smallholder farmers are considerably less than yields demonstrated in African research plots utilizing best management practices. Smallholder maize yields are typically 1-2 tons per hectare in comparison to the 8 tons per hectare achieved in research plots in the region. Optimal yields on small experimental plots are achieved by carrying out farming operations (such as planting, weeding, and fertilizing) at the optimal time and in the optimal amounts. Smallholder farmers are constrained in replicating the optimal practices conducted in experiments. The key operation that needs improvement is the timely removal of weeds. Until weeding is improved, farmers in Africa will not produce optimal yields.

Weeds need to be cleared from a field prior to planting a crop and weeds need to be removed from the field during the growing season. Keeping the crop free of weeds for the first third of its life cycle usually assures near maximum productivity. Hand weeding is the predominant weed control practice on smallholder farms. Researchers have produced clear-cut recommendations for optimal time of weeding. One week’s delay in first weeding may reduce maize yields by one-third, and two week’s delay in second weeding may reduce maize yields by one-quarter. Although a lot of energy is expended in removing weeds by hand, crop yields are generally very low due to weed competition, as a result of untimely and ineffective weed control. Weeding usually competes with other farm activities and is postponed to a later date. Late weeding results in crop losses, especially if it is carried out after the critical period of weed competition. In many instances, labor constraints force farmers to plant their crops after weeds have begun to grow. Such crops are easily smothered by weeds; these fields are abandoned. In Africa, yield losses in farmers’ fields range from 25% to total crop failure because farmers are unable to perform the necessary weedings at the optimal times.

The spraying of chemical herbicides to remove weeds is an alternative to handweeding fields. Research with herbicides has resulted in yield increases of up to 55% in maize and 75% in cotton. A recent maize experiment determined that chemical weeding was one-third the cost of two hand weedings. Chemical control is a better alternative to manual weeding because it is cheaper, faster and gives better weed control. Herbicides have been extensively studied in weed control research in Africa. However, there has been no mechanism to disseminate the technology once the research process was completed. This scenario has led to non-adoption of herbicide technologies on small-scale farms, although analysis showed that herbicide technologies were cost-effective and yielded higher returns than conventional methods. Generally, only 5% of smallholder farmers in Africa use herbicides. The greatest obstacle between herbicide technology and African farmers is lack of awareness and training.

All references for this case study are available at: http://www.croplifefoundation.org/africaweedcontrol.htm