

Technology Scaling – and constraints

Eco-friendly netting system that excludes insect pests, thus improving yield and profitability for small-holder vegetable farmers in sub-Saharan Africa (most of whom are women), while reducing or eliminating pesticide use.

- **CROPS:** Most of the conclusive data (improved yields w/reduced pesticides) have been collected on cabbage and tomato. Some preliminary data have been collected on watermelon, but more research is needed for all cucurbits. We need to do more testing on other vegetables, especially on leafy vegetables like kale and lettuce, which do not require pollination to crop.
In Kenya a crop like French bean is a huge market (#1 export), and thus by its importance to the economy more data needs to be developed for this crop, especially where grown commercially.
It should be noted that Nets increase the yield of indigenous vegetables such as Amaranth, Nightshade and Kale (e.g., microenvironment effect) -- and do so without the need for insecticides. Generally, these indigenous vegetables, used mainly for their leaves, have fewer insect pests compared with exotic vegetables such as tomatoes and cabbages.
In addition, “companion plants” [e.g., repellent plants or trap crops (pests), and/or attractant plants (bees)] could be associated with a particular vegetable crop under the Nets. This is especially important in situations where large mesh nets are required for microclimate reasons.
Spreading the expense of the initial investment across a greater number of crops extends benefit of initial investment.
- **MICROENVIRONMENT:** Nets provide water use advantages (20% increase in soil moisture) and increased humidity (4%). Additional strategies need to be developed to help reduce temperature increase (2%) inside the Nets used in hot climates like the dry season in Benin – e.g., make cooler nets by manipulating either mesh size, color or both (or angling the frame top).
- **INVESTMENT:** The Nets need to be mass produced and available to growers at a reasonable cost [currently ~10x cost of bed nets (85¢ – 51¢/m² vs. 8¢/m²), which are subsidized by ... WHO, etc.]. Net treatment with appropriate insecticides or repellents would be another strategy to improve efficacy.
- **BROADER ADOPTION and DIVERSIFIED USE:** Nets are a significant investment for a farmer. Commercial-scale demonstrations at export farms in partnership with NGOs in East and West Africa will speed adoption of the technology. For example, if French bean is to be exported, it must meet ever more stringent MRL's (residue-free?), which should encourage the Ministry of Agriculture, as well as public or private companies, to employ the use of Nets among small-/local- & commercial-scale growers.
- **TECHNOLOGY INTEGRATION:** The Nets can be combined with micro-irrigation and plastic mulch. The combination of these technologies should have a synergistic effect to increase the yield and the quality of production, but also to reduce the cost of labor and the efficiency of watering. Also, the same recycling industry for bed-nets will be available for growing agriculture applications.