Highlights
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Farmers benefit from adoption of bean integrated pest management technologies

During the 1990s, up to 100 percent crop losses were experienced by bean farmers in Hai district in northern Tanzania resulting in some farmers abandoning bean cultivation altogether. Following a request by a group of local farmers from Sanya Juu village a joint investigation was conducted by research teams at the Selian Agricultural Research Institute (SARI) in Arusha, farmers, local leaders and extension agents in 2001. The problem was confirmed as damage by adults (foliar feeding) and larvae (root feeding) of the bean foliage beetle *Ootheca* spp. Farmers and extension agents were previously unaware of the impact on roots by the larvae of this beetle, although foliar damage is a widespread problem in eastern Africa.

Traditional pest control strategies such as use of wood ash, cow urine, soap, and farmyard manure were tested in farmers' fields in different combinations.

The Sanya Juu farmers formed a research group in order to conduct on-farm experiments of their own and to communicate with other stakeholders. The farmer group, extension personnel, researchers and local leaders discussed various management strategies for experimentation in their group and individual fields. Traditional strategies (such as use of wood ash, cow urine, soap, kerosene, botanical crude extracts, farmyard manure as well as timely planting, and intercropping) and addition options suggested by research and development agents (such as crop rotation, use of high yielding pest tolerant bean varieties, and application of neem powder and rock phosphate fertiliser) were tested in farmers' fields in different combinations. The farmers decided against tilling the soil after harvesting the crop to expose larvae and pupae to natural enemies because the soils proved to be too difficult to plough during dry periods. They adopted a strategy of intercropping instead.

Farmer groups (both men and women) experimented with varying strategies in different locations where they tested crude botanical extracts, commercial chemicals (seed dressing, field spraying and storage management) and soil amendment technologies (use of green and animal manures and locally available rock phosphate and inorganic fertilisers). In successive seasons, the researchers, extension agents, local leaders and other service agents provided backstopping services and facilitated farmer activities including meetings and field days, and documented farmers' decision-making in research.

The on-farm experimental results proved useful and farmers selected the most suitable strategies for their situation, blending traditional and improved options. These innovative farmers disseminated the successful results with other farmers within and outside their communities. This has evolved into bean integrated pest management (IPM) through such means as farmer field

days. Through the regional bean networks (ECABREN and SABRN) these promotional activities have now spread to other districts in Tanzania and to Kenya, Malawi and Uganda and awareness is growing in other countries in the region.

Spreading the word

An important outcome of bean IPM has been the enhancement of social capital in farmer research groups. Group membership, (half of whom are women) is driven by interest in 'learning by doing' and sharing of information. These groups have enthusiastically engaged in group-to-group visits resulting in farmer-to-farmer spread of knowledge beyond the project target area.

Participatory group activities are designed to disseminate information on IPM technologies through sharing of knowledge and exchange of experiences. These activities involve many stakeholders such as policy makers, extension personnel, local farmers and leaders, NGOs, community-based and religious organisations, local schools and private sector service providers. Activities range from formal and informal training, seminars and workshops, farmer meetings, field demonstrations, to field days and visits, drama, songs, poems, preparation of leaflets and posters, and radio and TV programmes. Government and political leaders participated in project activities and have been supportive of project and farmer initiatives. Village information centres (see highlight no. 16) are providing easy access to information and technologies at village level and facilitate community application of the approaches to other problems.

Currently, over 260 farmer research groups are active in bean IPM work in eastern, central and southern Africa. Kenya has over 4,000 farmers, Malawi has a total of 1,500 participating farmers, Tanzania has more than 50,000 farmers and Uganda has 2,500 farmers. On average, 60 percent of participating farmers are women and some of them hold key leadership positions in their research group and community committees. All participating group members have gained confidence in addressing their group members as well as different audiences, reporting their field results and training others, organising and participating in field days and visits and seeking information on new technologies. Farmers have participated in the preparation and pre-testing of promotional materials and some have requested their local leaders to set aside space for establishment of new village information centres.

Farmers' benefits

The blending of indigenous knowledge and improved technologies coupled with field demonstrations, field days and cross-farm visits have empowered and motivated individual farmers and groups to conduct research on other constraints that limit agricultural production in their locations. In Hai district for example, the number of groups have increased (from 1 group researching *Ootheca* spp. management in 2001) to 88 groups who are now conducting experiments on 11 production constraints in different locations. Most of the farmers in target sites in the four countries have gained confidence and knowledge that has enabled them to access a variety of inputs and services; such as improved pest tolerant bean seed and other crop varieties fertiliser packets for use in experiments on soil fertility management, information on markets and different agroenterprises, and loans for farm inputs.

Uptake studies in Hai district have shown that these efforts have enabled farmers to increase bean grain yields from 120-180kg per acre to 480-600 bags per acre and maize from 700-1,000 bags per acre to 1,200-1,800 bags per acre. This has resulted in improved household food security; ability to pay children's school fees; better human health and a cleaner environment. Adoption studies in Kabale (south western Uganda) have indicated that even the illiterate farmer research group members have trained other farmers informally. Local leaders have testified in southern Tanzania that they are now finding it easy to mobilise community members for different development activities through the research group leaders. Policy makers and local NGOs and CBOs have applauded the participatory group approach and more of them have been motivated to use the groups for different rural development planning exercises and implementation of community projects in a similar manner.

Farmer participants have gained self-confidence. They know now that their traditional knowledge has value, that they can evaluate options and find the best combination of technologies to solve their own local problems. This has motivated and improved farmers' and other partners' morale, creating pride and confidence in sharing their innovations with other farmers, communities and visitors.

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Southern Africa Bean Research Network
SABRN

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