

IDRC FEATURE

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ETHIOPIA'S SORGHUM CROPS GET A BOOST

by Brhane Gebrekidan

Sorghum, the world's fifth ranking cereal crop, has been virtually ignored by agricultural scientists until recently except in the USA where it is grown primarily as animal feed. Despite its widespread production throughout the world, sorghum has come nowhere near reaching its potential. This article, adapted from a report recently written by Brhane Gebrekidan, leader of a sorghum improvement project in Ethiopia, describes one project in a network, supported by Canada's International Development Research Centre, that could make significant improvements in sorghum production and rural people's lives while contributing to the developing countries' scientific base.

The lives and well-being of millions of rural Ethiopians traditionally have been intertwined with the status of the sorghum crop. A year of good crops is often a year of prosperity, but if the sorghum crop fails, food supplies are scarce and famines become common-place.

Ethiopia, in fact, is probably the original home of sorghum and is the source of many wild and cultivated forms adapted to a wide range of growing conditions. Consequently, Ethiopia is a valuable reservoir of diverse genetic material for sorghum breeders throughout the world.

Sorghum is the dominant crop in parts of the country where drought and moisture shortage are the norm. In most of these areas, the traditional sorghums, although requiring a long growing season, give reasonable harvests in years of good rainfall. But they fail to produce any grain if the rains are inadequate. The recent droughts that have dominated these zones, along with most of Sahelian Africa, have caused the failure of the crops and resulted in massive famines and deaths. These painful experiences have forced the rural people in these areas to look for ways of stabilizing crop production.

Realizing such a need, the Ethiopian Sorghum Improvement Project was launched with financial support from Canada's International Development Research Centre (IDRC). It has tried to introduce early-maturing varieties along with recommended production packages. This has been done by holding field days near the project sites, carrying out demonstrations in selected farmers' fields, and through the Extension and project implementation Department, the Settlement Authority and State Farms. Farmers in these areas are now becoming more aware of the potential of early-maturing and drought-resistant sorghums adapted to the environment, pest and disease situation of the area. As a consequence, the demand for such sorghums is increasing.

A positive influence on food production depends on a multi-disciplinary approach, however. And since the project has not been in operation long enough to coordinate all disciplines and agencies influencing sorghum production in Ethiopia, and because varietal development is long-term by its very nature, the project's direct influence on sorghum production has so far been modest. However, the outstandingly successful breeding program that has been established promises to make a major contribution to the country's food supplies.

Two high-yielding cultivars developed or introduced by the project have substantially outyielded farmers' cultivars in high and intermediate altitudes. In the low rainfall areas, these new varieties can give up to 5 tons a hectare, and in high rainfall areas, they produce up to 8 tons a hectare in experimental plots. Average on-farm yield of the farmers' varieties is about one ton per hectare. A number of trials have been carried out to define packages of agronomic practices for growing these new sorghums in the country's various regions.

An important part of the research program has been to determine the major diseases and pests of sorghum in Ethiopia along with the most commonly found weeds, and to develop methods for their control. Surveys have shown that weed control is important since competition from weeds can reduce yields by at least 25 percent. The best herbicide for on-farm control of broad-leaf weeds has been identified. A major unresolved problem is the development of a control method for the parasitic witchweed, striga. If the weed can be effectively controlled, a major hurdle will be overcome in increasing sorghum output, and a limited program is currently underway.

Surveys carried out have identified 12 major sorghum diseases and 13 types of pests which have been classified into general, highland or lowland specific, and to high or low rainfall areas. This classification allows researchers to estimate the frequency of occurrence of the various pests and diseases by region, and to concentrate their control efforts in those areas.

One of the objectives of the project has been the collection of Ethiopian sorghums. At the end of the 1977 crop season, there was a collection of over 5,700 sorghum varieties which is being made available to other national programs and research institutes.

The project has become an excellent example of effective cooperation between Addis Ababa University and the Institute of Agricultural Research. Both institutions have given national responsibility for improving sorghum to the project. Almost all research stations and other government organizations interested in sorghum receive seed, guidance and consultancy from the project.

The Ethiopian Seed Corporation, which has recently been established, depends entirely on the project as a source of breeder and foundation sorghum seed. The project in fact played a prominent role in the establishment of the corporation and sorghum is one of its top priority crops for seed production.

Another important agency interested in the project is the government's Relief and Rehabilitation Commission since most of its activities are in sorghum-producing zones. The commission is very keen to popularize the new sorghum cultivars which can stabilize crop production in the drought- and famine-prone areas of the country.

The project also plays significant roles in the government's policy formulations. In general, the project's impact on government and national development policies, particularly as related to sorghum, is multifaceted: sometimes it assumes a catalytic role, at other times it gets involved in policy formulation, and sometimes it acts as a consultant and advisor. Whatever the role may be in national sorghum research, extension, production, and development policies, the project is seldom ignored.

The impact of the project on the Ethiopian scientific community is also significant. The comprehensive sorghum improvement activities of the project also continues to play a role in encouraging and stimulating other Ethiopian scientists to be more involved in sorghum related investigations, and it is the major force cultivating a team spirit among these researchers.

One other way in which the project has had a considerable impact on the Ethiopian scene is by developing a high quality, viable and comprehensive program using entirely local staff. The program has now matured enough for it to pay attention to most of the needs of the major sorghum growing zones in the country. The strength and development has come mainly about because of the emphasis on training staff. The project personnel participate in teaching and curriculum development at the Ethiopian colleges of agriculture, and the comprehensive program with its network of research stations has been one of the major reasons for the establishment of a graduate studies program in plant sciences in the country.

The Ethiopian Sorghum Improvement Project is now considered a very important unit in a worldwide network of sorghum improvement centres. The Ethiopian sorghum germ plasm collected, evaluated and distributed through the project is considered invaluable and is well known in most international, regional and national sorghum improvement programs.

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Brhane Gebrekidan, leader of the project, has been the national coordinator of sorghum improvement in Ethiopia since 1969.



Sorghum, a staple food crop for hundreds of millions who live in the semi-arid tropics, is used in the preparation of kemuse, a traditional bread in Ethiopia.



Part of the collection of native Ethiopian sorghums is displayed by Dr Brhane Gebrekidan (left) and Brhane Misaki.

PHOTOS: Neill McKee
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