partnership with CNFA that is focusing on the development of an agro-dealer network for input supply and output marketing, and the Seed Science Center at Iowa State University that has expertise in seed trade harmonization needed to create a competitive seed market. The Eastern and Southern Africa Seed Alliance (ESASA) is a similar initiative for eastern and southern Africa.

Joint IIAM-ICRISAT seed generation in Mozambique.

About ICRISAT

ICRISAT
Science with a human face

The International Crops Research Institute for the Semi-Arid Tropics (ICRISAT) is a non-profit, non-political organization that does innovative agricultural research and capacity building for sustainable development with a wide array of partners across the globe. ICRISAT's mission is to help empower 644 million poor people to overcome hunger, poverty and a degraded environment in the dry tropics through better agriculture. ICRISAT belongs to the Alliance of Centers of the Consultative Group on International Agricultural Research (CGIAR).

Company Information

ICRISAT-Patancheru (Headquarters)
Patancheru 502 324
Andhra Pradesh, India
Tel +91 40 30713071
Fax +91 40 30713074
icrisat@cgiar.org

ICRISAT-Liaison Office
CG Centers Block
NASC Complex
Dev Prakash Shastri Marg
New Delhi 110 012, India
Tel +91 11 32472306 to 08
Fax +91 11 25841294

ICRISAT-Nairobi (Regional hub ESA)
PO Box 39063, Nairobi, Kenya
Tel +254 20 7224550
Fax +254 20 7224001
icrisat-nairobi@cgiar.org

ICRISAT-Niamey (Regional hub WCA)
BP 12404, Niamey, Niger (Via Paris)
Tel +227 20722529, 20722725
Fax +227 20734329
icrisatsc@cgiar.org

ICRISAT-Bamako
BP 320
Bamako, Mali
Tel +223 20 223375
Fax +223 20 228683
icrisat-w-mali@cgiar.org

ICRISAT-Bulawayo
Matopos Research Station
PO Box 776,
Bulawayo, Zimbabwe
Tel +263 83 8311 to 15
Fax +263 83 8253/8307
icrisatzw@cgiar.org

ICRISAT-Lilongwe
Chitedze Agricultural Research Station
PO Box 1096
Lilongwe, Malawi
Tel +265 1 707297/071/067/057
Fax +265 1 707298
icrisat-malawi@cgiar.org

ICRISAT-Maputo
c/o IIAM, Av. das FPLM No 2698
Caixa Postal 1906
Maputo, Mozambique
Tel +258 21 461657
Fax +258 21 461581
icrisatmoz@panintra.com

www.icrisat.org

Feb 2009

Seed Systems

Enhancing the availability of quality seed of improved varieties for smallholder farmers

ICRISAT
INTERNATIONAL CROPS RESEARCH INSTITUTE FOR THE SEMI-ARID TROPICS
Science with a human face

Introduction

The future development of agriculture in sub-Saharan Africa is dependant on the ability of (i) a commercial seed industry to supply enough quality seed, and (ii) complementary inputs to smallholder farmers to boost agricultural productivity and generate marketable surpluses. These surpluses can be moved from food surplus to food deficit areas, exported whole or processed into value-added products by agro-processors for local consumption or export.

The move from largely subsistence to more commercial agriculture will take time. Until small-scale producers are effectively linked to reliable input and output markets, they will continue to rely largely on their own seed or on seed sourced through informal networks. Although such systems are resilient, they have failed to deliver increased productivity that is needed to improve food security and provide the raw materials needed for agro-industries to grow.

The Challenges

Under the commercial growth scenario, seed systems will need to deliver high-quality seed of a range of crops and varieties that are appropriate both to the consumption needs of the rural population and to the market demands of agro-processors for local consumption and export. As African agriculture becomes more commercialized, the balance between these requirements is expected to shift towards the needs of market responsive processors and distributors.

Inside a seed processing factory.

Grading groundnuts before shelling.

So what will give African farmers a competitive advantage? This will largely depend on ensuring the long-term sustainability of the technology development and dissemination system and the system's ability to innovate in response to market opportunity and change.

Experience shows that subsistence farmers in Africa are very vulnerable to production risks caused by climatic variability and other factors, and that relief interventions will continue to be required to save lives and protect livelihoods. However, the development of the more formalized seed system needed to support commercialization will only proceed if there is general agreement on the need for independent seed delivery through commercial entities or civil society organizations. It has been repeatedly shown that ad-hoc public sector interventions frequently impede or set back efforts to develop a sustainable agricultural inputs supply system. If disasters occur that require seed interventions, or if poverty limits the ability of farmers to access seed through commercial channels, market friendly safety nets, which avoid undermining the development of the formalized seed and input supply system, must be implemented.

Small versus large seed companies

There has been an assumption that genetic technology in Africa is similar to other parts of the world where a few innovations and varieties will work over large areas. This tends not to be the case. There are examples of broadly adapted single varieties or technologies, but they tend to be the exception rather than the rule. In other parts of the world where conditions are more uniform, and especially where irrigation contributes to uniformity, varieties tend to have broader adaptation. The dominance of local use in Africa adds taste considerations to variety choice and tends to increase the list of required characteristics.

Training seed entrepreneurs in Nampula, Mozambique.

Varietal performance is determined locally. Farmers tend to be cautious about accepting new varieties. They are more so when they are aware of the extent of variation in performance from place to place. Local trials are the fundamental means of both determining and showing performance. Farmers in some locations may learn to accept results from research and distant locations, but those cases are the exception rather than the rule. Most African farmers will require local trials and demonstrations to be convinced.

Variability in local performance results from climatic variability and variation in soil structure and fertility. Much of African agriculture is conducted on highly weathered soils in areas of high rainfall variability subject to extreme climatic events. Soil variability is accentuated by the limited amounts of fertilizer used, which make variety performance variable from location to location.

Larger seed companies run their own breeding programs and for field crops tend to focus on hybrids for several reasons; the demand for fresh seed is more regular and proprietary technologies are protected biologically. However, the higher expenditures associated with maintaining crop breeding programs and focusing on hybrid seed production necessitates access to relatively large markets both to spread marketing risks and promote economies of scale.

Smaller seed companies without research overheads and operating at state or even district level thereby reducing transport costs should be capable of supplying seed at competitive prices. These companies should also be better placed to determine local performance and farmer preferences, and facilitate local distribution in the areas of influence of each company. The sale of cheaper seed by these companies will be able to draw in more customers at the margins who would not benefit from improved seed without them.

The existence of several companies operating in the same area will encourage quality and price competition, and ultimately stimulate commercial investment in crop breeding.

Africa needs large- medium- and small-sized seed companies to support the commercialization of agriculture in a way that is both biologically sustainable, and consistent with market needs and opportunities. Over-reliance on a single species has been the tendency in the maize growing areas of eastern and southern Africa. Here, the governments initially supported large-scale parastatal seed companies to market subsidized hybrid maize seed and fertilizer, but this has not led to sustained increases in productivity or improved food security. The hybrid technology has been proven to be relatively successful when combined with fertilizer in better-endowed areas, and for this reason the large-scale seed companies – including the largely privatized parastatals - continue to pursue this market.

Conclusion

ICRISAT is working to support the development of open seed markets and local seed companies that can supply quality seed of improved varieties at affordable prices in ways that are sustainable. We believe that the entrepreneurial spirit that is alive and well in Africa can be harnessed to achieve this.

In West Africa, ICRISAT is supporting the development of local seed companies under the West Africa Seed Alliance (WASA) that has the ambitious goal to increase smallholder yields and incomes through the competitive and reliable provision of high quality affordable seed to smallholder farmers. This work is being done in

Inside a seed trader godown.