Progress in SMIP Intermediate Result 1.2, Increasing Productivity

G M Heinrich (Project Manager, SADC/ICRISAT Sorghum and Millet Improvement Program, PO Box 776, Bulawayo, Zimbabwe)

Introduction

Research in Phase IV of the SADC/ICRISAT Sorghum and Millet Improvement Program (SMIP) is structured under four broad objectives, or Intermediate Results (IRs) —development and dissemination of improved varieties; improvements in crop management and productivity; partnership building and networking; and development of market systems for commercialization of sorghum and pearl millet. The second IR in this list (IR 1.2) relates to: "Farmers in targeted areas using a wider range of crop management options, leading to improved productivity."

This work focuses primarily on the adoption of improved soil fertility and soil water management technology by smallholder farmers. Progress will be evaluated in terms of the level of adoption of improved production technologies by farmers in specified target areas in Zimbabwe and Tanzania.

The work in IR 1.2 is linked to the other SMIP work on seed systems, marketing and commercialization, and regional networking. Improved markets provide incentives for farmers to adopt both improved varieties and improved crop management practices. Combining improved varieties with improved management practices ensures that farmers are able to capitalize on the increased production potential of the new varieties, and provide a consistent supply to developing markets. SMIP scientists and partners work together to ensure that activities under the different IRs are implemented in the same geographical areas, and experiences gained are shared through the regional network. SMINET.

This article provides an update on progress on IR 1.2, as outlined in the SMIP Project Document (pages 24-29).

Activities and progress

Following the SMIP Phase IV Document, IR 1.2 activities were planned for Tanzania and Zimbabwe. Three main activities were scheduled for the first year—literature reviews, baseline surveys, and identification of at least five promising technology options for participatory on-farm evaluation in target areas.

Literature reviews covering past research on soil fertility and soil water management, as well as current extension recommendations and adoption levels, were conducted by partners in both Tanzania and Zimbabwe.

In Tanzania, the review was led by Dr George Ley, based at the national soil research institute, Mlingano. In Zimbabwe, the work was led by scientists at the University of Zimbabwe: P. Mapfumo, E. Chuma, and K. Giller. The FAO Regional Office for Southern Africa contributed both financially and technically to the review in Zimbabwe. The literature reviews for both countries have been completed and will be published in the next few months.

Baseline surveys were necessary both to assess farmers' current practices and constraints and to provide a baseline against which future adoption of innovations could be measured.

In Tanzania, a baseline survey was conducted in Same district in the Northern Zone, in Aug and Sep 1999. Due to a series of unforeseen constraints, data analysis has been delayed. However, data entry and verification has now been finalized, and the analysis should be completed fairly soon. Also, since the scientists who implemented the survey were directly involved in setting up the subsequent on-farm research program, much of the information gained has been utilized. Since the implementation of this first survey, an additional target area in Dodoma district has been identified. It is likely that a second baseline survey for Dodoma will be required.

In Zimbabwe, baseline surveys were conducted in the first quarter of 1999. This work was led by Dr David Rohrbach of ICRISAT. The surveys were conducted in two districts, Tsholotsho and Gwanda South. Tsholotsho district lies in a 400-600 mm rainfall zone, while Gwanda South normally receives around 400 mm or less. Data from these surveys have been analyzed. An initial report has been drafted, and will be published before the next cropping season.

Identification of promising technologies for on-farm participatory evaluation was based on the outputs from the literature reviews, baseline surveys, and discussions with scientists, extension workers, and farmers. In **Tanzania,** technologies identified included: sorghum/ pigeonpea inter-cropping, legume rotations (pigeonpea, groundnut, and *Dolichos lablab*) to improve soil fertility, and the use of farmyard manure (FYM). In future, work on the management of FYM (to increase both quantity and quality) and combinations of organic and inorganic fertilizers may be added to the program.

Pigeonpea has a ready market, and a high market value, in Tanzania. It can contribute significantly to maintaining and improving soil fertility, as well as improving household nutrition and income. However, medium-duration varieties adapted to the semi-arid areas have not yet been clearly identified and released, and sorghum/pigeonpea intercropping systems have received little attention. Current work focuses on identifying appropriate varieties and cropping systems.

On-farm participatory research was initiated in the 1999/2000 cropping season. It is being implemented by scientists from the Department of Research and Development, in collaboration with extension staff. Due to a late start to the rainy season, and limited planting opportunities, the program got off to a somewhat shaky start. Nonetheless, the trials have been implemented, and work is under way.

In **Zimbabwe,** technologies selected for on-farm research included: manage-ment and utilization of FYM, combina-tions of FYM and inorganic nitrogen, legume rotations (cowpea, groundnut, bambaranut), and the use of modified tied ridges for water conservation. The use of dead-level contours and infiltration pits may be added as additional water management options.

The work was initiated, in a limited way, in the 1998/99 season and considerably expanded in 1999/2000. It is being implemented by SMIP and ICRISAT, in collaboration with several partners—the Department of Research and Specialist Services (DR&SS), AGRITEX (extension), TSBF (Tropical Soil Biology and Fertility), DFID (Department for International Development, UK), and the Intermediate Technology Development Group (ITDG). Due to unusually high rainfall in western Zimbabwe, the trials have been very productive this year. The response from farmers involved in the technology evaluation has been very positive.

Conclusions

The activities planned for IR 1.2 have been largely implemented on schedule, and work is progressing well. Publication of some of the outputs has been unfortunately delayed, but these should become available in due course.

The future

In Tanzania, there appears to be considerable potential for improving soil fertility and farm incomes by including appropriate pigeonpea varieties in semi-arid production systems. Both farmers and institutional partners are very enthusiastic about the possibilities. Since market-acceptable medium-duration varieties are available for on-farm testing, it is hoped this work can progress rapidly.

In Zimbabwe, farmers have responded positively to technologies for the management and use of FYM. In the higher-rainfall areas, the combination of organic and inorganic fertilizer is also popular. Tests have shown that improved water management systems are practical under smallholder conditions. Plans are currently being made with DR&SS and AGRITEX to test methods of stimulating broad adoption of the most popular tech-nology options in the coming season.

Performance of the Sorghum Variety Macia in Multiple Environments in Tanzania

H M Saadan[1], M A Mgonja[2],and A B Obilana[3]
(I.Lead Scientist, Sorghum and Millet Improvement Program, ARTI Ilonga, PO Ilonga, Kilosa, Tanzania; 2. Network Coordinator, SADC/ICRISAT Sorghum and Millet Improvement Program, PO Box 776, Bulawayo, Zimbabwe; 3. Principal Scientist (Breeding), ICRISAT-Nairobi, PO Box 39063, Nairobi, Kenya)

Introduction

Sorghum is grown in six out of seven zones in Tanzania. It is produced mainly for home consumption and is a key factor in household food security, particularly in marginal areas with low rainfall and poor soil fertility. Collaboration between the SADC/ICRISAT Sorghum and Millet Improvement Program (SMIP) and the National Sorghum and Millet Improvement Program (NSMIP) was initiated in the early 1980s and has been instrumental in the development, selection, and release of improved varieties. This article summarizes information about the development and testing of the recently released sorghum variety Macia (SDS 3220), including comparisons with two released varieties, Pato (SDS 2293-6) and Tegemeo (2KX 17/B/I); and an improved, Zimbabwe release SV 1.

On-station and on-farm trials

SDS 3220 was developed at SMIP's Matopos Research Station in Zimbabwe through mass selection in the F_4 generation from M91057 (pedigree [GPR 148 x E35-1] x CS 3541) introduced from ICRISAT-Patancheru, India.