

Flock of improved and indigenous goats at KAZARDI

Achievements and progress so far include:

- Raising a parent stock of pure Boer and 50% Boer-local cross breeds. The process of back-crossing to produce 75% cross breeds and eventually well adapted pure Boer goats has been initiated.
- Availing parent stock to 16 farmer groups, four in each district in SWHAEZ. One of the groups, Nyakibande Twetungure Farmers' Group has a stand stock at more than 300, 50% Boer-local cross breeds. In this group, offsprings that attain the age of seven months and beyond are sold at Sh. 100,000/ each compared to Sh. 40,000 from local goats which are worth selling at two years after birth.
- Facilitating development of a Goat Producers Association with membership drawn from the four districts in the zone. The association serves as a private sector organization to multiply good quality parent stock for accessing of improved goat breeds by other farmers. Work has been initiated on establishing the land holding capacity of the available pasture to come up with feeding recommendations.
- Research aiming at developing recommendation for managing intestinal parasites is being conducted.
- A fodder bank of 0.8ha has also been established to provide high protein source pasture legumes and the total grazing area has been expanded to maintain a sizeable stock.

Highland cereals (Sorghum, Wheat, Barley and Up-land rice).

Sorghum is a staple and popular crop in the zone. It is both a food and cash crop, and with a lot of cultural attachment among the population. Wheat and barley, being some of the crops that require semi -temperate climatic conditions were also introduced in the zone. Thus, Kachwekano ZARDI has comparative advantage for their R&D activities because it is located in a zone with suitable environmental conditions for these crops. Due to prioritization in use of the limited available funds, activities on sorghum are limited to evaluation of accessed germplasm for some required attributes. Activities on wheat and barley are limited to production of seed on demand.



Figure 3: L-R. A sorghum field trial in Kabale and an Upland rice field trial in Kanungu district

Partnerships and Linkages

Kachwekano ZARDI implements most of its activities through both local and international partnerships and collaborations. It has strong linkage with CGIAR, CIP, ASARECA, FAO, Local governments, UNSPPA, SSACP, NGOS and above farmer groups in the zone.

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NARO KACHWEKANO ZARDI

Background

Kachwekano Zonal Agricultural Research and Development Institute (KAZARDI) is located in Kabale District in South Western Uganda, in premises formerly hosting Kigezi District Farm Institute (DFI). After NARO's decision to take research services closer to end-users, Kachwekano DFI was transformed into an Agricultural Research Development Centre (ARDC) in 2000. The recent restructuring of NARO (see the NARS Act, 2005) upgraded Kachwekano ARDC to a Zonal Agricultural Research and Development Institute (ZARDI). The institute is composed of three stations; Kachwekano (Administrative seat), Kalengyere and Bugongi (field stations). Kachwekano ZARDI spearheads agricultural research and development work in Uganda's south western highlands agro-ecological zone (SWHAEZ) that administratively comprises Kabale, Kisoro, Kanungu and Rukungiri districts.

Institute's major functions

The institute's research and development activities focus on:

- Generating up-to-date information that reflects research and development needs of the people and farming systems in the zone. Such information is then used for re-designing the agricultural research agenda to cater for the dynamism in people's interests, constraints and emerging enterprise market opportunities.
- Developing technologies, practices, and tools for use by producers, processors and traders in order to continuously improve the farming systems productivity and its agro-enterprise competitiveness.
- Building and promoting and partnerships other NARO institutes CSO's, local government and private sector organizations for generating and implementing research agenda with the purpose of enhancing quick technology development, adoption and dissemination.
- Production of foundation "seed" (planting and stocking materials) of priority crop types, varieties and livestock species.

- Promotion, through uptake pathways (e. g NAADS, conventional extension, NGOs, CBO's) of proven technologies and research products.

Key program and projects

Kachwekano ZARDI currently undertakes several projects but mainly under following commodities or programs: Solanum (Irish) potato, temperate fruits, sorghum and goats. It also conducts adaptive research on beans, banana, coffee, and sweet potato in collaboration with National Crop Resources Research Institute (NaCRRI), barley and wheat, and is always on the look out for opportunities of research for development. Some achievements have been made on each of the key program.

Potato

South Western Uganda is the potato basket for this country although is also produced in Mbarara, Isingiro, Rakai, Mityana, Mbale, Sironko, Kapchorwa, Nebbi and Arua districts. However, some farmers in these distant districts access clean seed potato either directly from KAZARDI or through the Uganda National Seed Potato Producers Association (UNSPPA).

The program has developed more than ten varieties and most popular among them include;
Rutuku, Victoria, NAKPOT 1, 2, 3, 4 and 5, and KACHPOT 1 and 2. These varieties are suitable for consumption in many preparation forms. Nonetheless, KACHPOT 1 and KACHPOT 2 are particularly good for making potato crisps and for chips, respectively. Other technologies/practices developed and are being promoted for profitable potato production include;

- Options of fungicide spray for control of potato late blight disease
- "Small Seed Plot Technique" for producing quality seed potato by small-scale farmers
- Spacing and fertilizer rate recommendations for increasing the proportion of marketable size of table potato tubers especially for chips processing
- Using Farmers Field Schools (FFS) and adaptive Farmer Research Groups (FRG) approaches for technology development and dissemination. These approaches have led to empowering farmers to demand for improved and appropriate technologies and to influence design of research and technology promotion process.
- Production of potato plantlets from tissue culture which are multiplied in aeroponic unit and screen houses to generate mini tubers for field multiplication.



Figure 1: L-R Potato plants in an aeroponic unit and mini tuber development .

Temperate Fruits

Temperate fruits are a new agro-enterprise in Uganda and is becoming popular among the uptake pathways including farmers, local governments and NGOs. The enterprise is best suited for cool highland areas although some farmers in mid-altitude zones have also shown interest and this has encouraged KAZARDI in partnership with other organizations to initiate preliminary cultivar adaptation trials. The aim of introducing temperate fruits growing in the zone is to avail a high-value crop for alternative income generation in the zone, besides contributing to improvement of nutrition of the people whose local diets generally lack fruit compliments. The main temperate fruit species being evaluated are apples, pears, peaches, plums, figs, nectarine and grapes. Among them however, apples and pears are the most promising. The main activities of this program include but not limited to:

- Accessing and evaluating different potential temperate fruit tree species and varieties for adaptation in Uganda
- Developing technologies, practices and strategies (agronomic, pest and disease protection, post harvest handling and processing, marketing) for enhancing production of temperate fruits
- Developing a strategy for multiplying and availing quality planting materials to farmers timely and at affordable prices.
- Building capacity of community members for economic production of temperate fruit in the zone and other suitable areas in the country.

Achievements and progress so far include:

- Two apple varieties; "Anna" and "Golden Dorset" have been officially released.
- Two pear verities "Taiwan Hybrid" and "Naspal" that are high yielding, adapting to local conditions and with good culinary qualities have been identified but are still undergoing field testing.
- More promising candidate apple varieties for both highland and mid-altitude zones are being evaluated. and so far "Winter Banana", "Rome beauty", "James Grieves", among others have been identified but still under field testing.
- Candidate fungicides for controlling white powdery mildew and apple scab have been identified and undergoing field testing
- Indicative fertilizer recommendations for optimum apple tree establishment have been developed and are being tested at farm level
- Identification and testing of "ground layering" and "stooling" techniques with potential for production of rootstocks, hence mitigating the high cost of importing seed for rootstock production.



Figure 2: Scientist and interns observing and collecting performance data on apples

Goats

The systems and livelihood analysis done in the zone indicated that goat rearing was being practiced by majority of households irrespective of wealth rank. However, the low growth rate and very low slaughter weight were among the main constraints associated with goat production in the zone. In view of this, a program for developing and promoting goat breeds with high growth rate and slaughter weight was initiated. Local goats are being crossed with exotic Boer breed. The off-springs (cross-breeds) are evaluated both on-station and on-farm for performance under local conditions. Through farmer research groups, farmers are being trained on managing improved goat breeds for optimal output.