Ministry Paper /2015

Research and Development Division

1.0 Purpose

The matter for tabling is an update on major initiatives being undertaken by the Research and Development Division of the Ministry of Agriculture.

2.0 Livestock Improvement and Development

The Livestock Research and Improvement Unit through its Animal Breeding and Husbandry Programme is responsible for the conservation and maintenance of the national collections (gene banks) of cattle breeds (Jamaica Hope, Jamaica Black and Polled Jamaica Brahman cattle); Small ruminants (Boer, Nubian and Graded goats, sheep) and swine; an animal genealogy database and forage gene bank, which aims to develop more sustainable, efficient and competitive livestock farming systems for the sector.

During the 2015/2016 period the Division will be involved in special projects and programmes geared towards developing effective animal production systems for all classes of animals and strategies to mitigate against the impacts of climate change. Special attention will continue to be placed on the need for diversification within the livestock sector through the promotion of small ruminant production.

The small ruminant project entitled, "Diversification of the Livestock sector through Small Ruminant Production" is jointly funded by the Government of Jamaica and the Common Fund Commodities (CFC), while, the Jamaica Dairy Development Board will continue to support the Hay Commercialization Project. Assisted breeding technologies such as embryo transfer technology and artificial insemination will be more extensively applied to facilitate the conservation and expansion of genetic material of high performance animals of both beef and dairy cattle and small ruminants.

3.0 Special Projects being implemented by the Research & Development Division

3.1 Diversification of the Livestock sector through Small Ruminant Production Project (CFC)

The small ruminant industry continues to play an important economic and nutritional role in the region. However, production from the small ruminant industry in the Caribbean still accounts for only 25% of the total mutton and chevron consumed regionally. The other 75% is derived from imports mainly from Australia and New Zealand. Hence increasing the production of these commodities through capacity building and strengthening along the value chain continues to be a top priority.

The Project started in January 2012 with duration of 4 years. CARDI is the project executing agency and in the case of Jamaica the Ministry of Agriculture and Fisheries Research and Development Division and the Rural Agriculture Development Authority RADA are the implementers.

The main challenges and opportunities faced by the industry to be addressed under the project were identified as follows:

- Insufficient breeding females due to indiscriminate slaughtering and hence the need for the provision and multiplication of improved breeding stock for increased meat production to be available to small ruminant producers
- Competition from low cost imports from extra-regional countries to be offset by innovative value added products and the use of low cost/indigenous based raw materials
- Slow rate of farmer adoption of improved technologies and management practices thus warranting improved and relevant training programmes and facilities to overcome this challenge
- Escalating feed prices and the fact that only a few farmers actually cut forage from their own fodder banks. The opportunity therefore exists to mitigate the effects of escalating feed prices through the increased utilization of high nutrient

forage crops. Proven forages such as Mulberry and Leucaena, as well as the development of fodder conservation programmes, (hay and silage) to fulfill this need

- Larceny is a scourge within the industry. The controlled slaughter of animals and more widespread housing (as a semi-intensive animal rearing system) is expected to contribute to the alleviation of this problem.

Implementation of the project is being undertaken through four components

- **Component A - Breed Improvement & Dissemination of Stock:** To improve the quality, quantity and availability of small ruminants

- **Component B - Technology Transfer & Capacity Building:** To facilitate the dissemination of knowledge and diffusion of technology to relevant stakeholders

- **Component C - Small Ruminant Production**: To improve food and nutrition security in the CARICOM Region through the increased production of small ruminants & processed products

- **Component D - Marketing and Processing:** To improve the marketing channels and processing options so as to ensure maximum value to the producers and consumers

3.1.1 Current Situation

The project is now at the start of it fourth year. Since commencement, the project faced several challenges with the procurement of animals which significantly delayed the breeding and subsequent distribution of animals to breeding clusters.It is anticipated that in FY 2015/16 that the distribution of 150 breeding females to 30 breeding clusters across the island will be realized and that 50 farmers will benefit from artificial insemination and natural servicing for the production of fatteners.

3.1.2 Achievements of the Project to date

- 244 targeted animals have been acquired (58 Imported and 186 from Local Stock, 224 breeding female sheep and goat)
- A total of 190 offspring (114 sheep and 76 goats) have been produced to date through the breeding programme with 55 animals currently available for distribution to breeding clusters and 40 lambs for distribution later in 2015
- 200 (75% Katahdin and 25% Dorper) sheep embryos imported and 100 surrogate sheep procured for implantation; Phase 1of the embryo transfer work initiated
- Three Agriculture training institutions selected as part of breeding clusters (Ebony Park Heart Academy, CASE and Knocalva) Their participation will strengthen their livestock small ruminant breeding programmes and facilitate these institutions contribution to the surrounding farming communities.
- A forage-based feed delivery system has been developed at the project site at Hounslow Demonstration and Training Centre (DTC) with the establishment of 5.5 ha of fodder banks (Sorghum, Mulberry, *Leucena* and *Trichantera*)
- Improved carrying capacity of the Hounslow centrewith the rehabilitation of 15 ha of pasture Pangola (*Digitariadecumbens)* for grazing.
- Purchase of farm machinery, tools and equipment to enhance the husbandry and feeding systems including tractor, posthole auger, forage harvester, irrigation system, disc plough, brush cutter and fertilizer spreader
- Completed renovations to animal shelter at Hounslow
- Completed training-of-trainers programme (15 Officers from RADA and the VSD were engaged in a resident training programme) utilizing renovated classroom and dormitory facilitiesat Hounslow DTC
- Training of 75 small ruminant producers in animal husbandry
- Phase 1 renovation to Bodles training abattoir completed
- Phase 2 design of waste treatment system to be sent for tender in April 2015
- Invitations for proposals for consultancy by a cluster development coordinator completed

3.2 Hay Commercialization Project at Bodles and Hounslow

The Bodles Research Station and Hounslow Demonstration Training Centre with financial support from the Dairy Development Board in the amount of J$24,000,000 were designated to become best practice centres for hay production.The main goal is to demonstrate the utilization of hay as an alternate feed source in the mitigation of the adverse impact of seasonal and extended drought and inadequate supplemental fodder resources on dairy cattle production in Jamaica.Over the medium term it is anticipated that at the Bodles Research Station hay can replace approximately 50% of concentrate feed used by the Jamaica Hope nucleus herd resulting in improved efficiencies in milk production achieving 10L/cow/day up from the current average of 6.3L/cow/day. Excess hay would also become available to producers in and around these centres.

Objectives

The project has the following objectives:

- Increase the land used for hay production by 24 hectares at Bodles Agricultural Research Station and the Hounslow Demonstrate and Training Centre through the rehabilitation of 9 hectares of existing pasture and the establishment of 3 additional hectares of pasture land for hay production at Bodles; and at Hounslow the establishment of 12 ha of mulatto II and Pangola for hay production
- To provide alternate supply of fodder during the dry season and demonstrate a decrease in the total dependence on concentrate usage by 50% over three years
- Increase milk production by 20% per year until average milk production is a minimum 10litres/cow/day up from current levels of 7litres/cow/day.
- Provide low cost high quality hay to dairy farmers in St Catherine and St Elizabeth, thereby increasing milk production during the dry periods of December to April.
- Production of 500 bales of hay/ha/cut with four cuts per year per location with projected yields of 48,000 bales of hay across the two stations; Amount to be made available to livestock farmers 36,000 bales the remaining to supply the Research Station Dairy Animals

3.2.1 Current situation

The establishment of 12 ha at Hounslow is underway. Field preparation, completion of expansion of the irrigation system with incorporation of a traveller system and fencing activities are expected to be completed by the end of first quarter of 2015. It is anticipated that in 2015/16 that the hay fields at Hounslow would be completely into production comprising fields of pangola and mullato II grass species, It is projected that 24,000 bales of hay per year will be produced at the Hounslow location.

3.2.2 Achievements

- 9ha of pasture rehabilitated at Bodles for hay production and an additional 3ha established meeting the target at that location of 12ha
- 352 bales of hay was available for sale to livestock community produced from one cutting from one hectare from Bodles
- Rehabilitated and reconditioned 7 ha of pangola hay pastures at Hounslow
- Expanded underground irrigation system to support 12ha of commercial hay production

4.0 Crop and Plant Protection - Clean seed programme

There is a critical need to produce clean planting material for the production of ginger and root and tuber crops to address low yields and vagaries of vegetatively propagated pathogens. Consequently, the Research and Development Division through its phytosanitary and crop research programmes will play a critical role in the production and supply of certified clean planting material to the agriculture sector. Several initiatives supported by

- IICA Jamaica in the case of the production of planting material for the commercial production and export of a new sweet potato variety, Beauregard
- The Colombia /Jamaica South South Cooperation, the Canadian Health Foundation, JSIF and the Jamaica Exporters Association in the development of a local Irish Potato certification seed production programme and also screening of new early and high yielding Irish Potato varieties for resistance to late blight, and value added potential for processing

- The Export Division led initiative to address the quality and availability of clean ginger planting material. The large quantity of planting material required for ginger is certainly one of the uneconomic aspects of its production. It is estimated that about 1.12 tonnes of seed ginger are required to plant a hectare. Tissue cultured plants are being multiplied and several ginger nurseries in Jamaica have been established as „clean seed rhizome" producers including three in the Research and Development Division of the MOAF. The Research and Development Division through its tissue culture laboratory is supporting the Export Division led initiative by the provision of tissue cultured stock material of selected high yielding clones of local ginger varieties and conducting studies into the determination of efficient clean "seed rhizome and field production systems

5.0 Crop Breeding Improvement Work

- ***Development of Virus-resistant Scotch Bonnet*** Work continued on the breeding development of a Tobacco etch/potato virus Y (TEV/PVY) resistant scotch bonnet cultivar with field trials established for further purification and evaluation on farmers holdings. Results to date show significantly improved yields and tolerance to the two viruses for two scotch bonnet lines. It is projected that on successful completion of the 2015/16 evaluations that the lines will be ready for release

Crop Germplasm Conservation characterization and utilization

- ***Tomato*** -Collaborative work continued with the St. Jago Farms Supplies Company and AMSA Seed Company of California with the field screening of 540 tomato lines for tolerance to the Tomato Yellow Leaf Curl Virus, TYLCV in order to identify prospective resistant or tolerant tomato varieties. The Jamaican farmers stand to benefit from this work as the improved lines will be released for use in the tomato farming community. Five tolerant lines have already been released over the 15 years of this collaboration.

- ***Cassava (Jamaica Columbian Technical Cooperation)*** – Field evaluations of 11 imported cassava varieties from CIAT Colombia continued. Each variety was multiplied using the 2-node mass propagation technique and established in field trials. Varieties are being characterized based on phenotype, yields, tolerance to pest and diseases, dry matter

content, starch content and potential for mechanized harvesting. Evaluations are being conducted at the Bodles, and Montpelier Research Stations.

- ***Identify suitable short day and intermediate (mid day) Onion varieties*** - The onion varieties Sweet Caroline,07-28-11, 106-28-874, Mata Hari, and Serengeti with Sweet Caroline being the control are currently under evaluation for yield performance and storage qualities.

Derrick Kellier, CD
Minister of Agriculture, Labour & Social Security
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