

THE COMPLETION PROJECT - Tying it all together...  
Enhancing Sustainable Dairy Production Capacity in Cuba  
CPA 26 Julio, Nueva Paz, Habana Province  
April 18, 2006

## BACKGROUND

During 2005, *Enhancing Sustainable Dairy Production Capacity in Cuba*, a volunteer, farmer-led project conducted under the auspices of the Canada Cuba Farmer to Farmer Project, brought together farmers from Canada and Cuba to begin to build a sustainable model for dairy production in rural Cuba.

Our project partners were International Centre for Sustainable Cities (Canada) and Asociación de Agricultores Pequeños (ANAP, Cuba). The Project was funded in part by the Projects and Innovations Branch, CIDA.

The work was carried out at the agricultural cooperative CPA 26 Julio, located in the municipality of Nueva Paz, Habana Province.

During this time, we undertook the following steps:

1. Construction of 3 hectares of Pedestals (grass/legume rotational pastures) for cows in 1-130 days of lactation.
2. Construction of 15 hectares of solar-powered, electric-fenced micro-pastures for cows in later stages of lactation (+130 days).
3. Installation of water pumps and irrigation equipment to support the Pedestals and pastures.
4. Development of skills and facilities for the implementation of a calf-rearing program to be undertaken by female members of the CPA.
5. Planting of shade trees along the perimeter of the micro pastures (Nim).
6. Construction of water troughs for the shade areas.
7. Liaison with appropriate scientific institutes (Instituto de Ciencia Animal) to provide ongoing collaborative support to the CPA.
8. Production of the Spanish-language training video *Si, se puede!* (Yes, we can!)
9. Project evaluation.
10. Development of a strategy to disseminate Project success.

The very successful results of this Project are documented in the report [Enhancing Sustainable Dairy Production Capacity in Cuba – Final Report to CIDA](#), March 17, 2006.

## COMPLETION PROJECT

In the end of March, myself and Ontario dairy farmers Jim and Gladys Millson spent a week at the CPA to collaborate with the Cuban farmers on steps that need to be undertaken to tie together the capacity enhancements of this one year pilot project with the whole-farm priorities of the CPA in order to make this model truly durable, productive and sustainable.

The following are the conclusions reached by the Canadian and Cuban farmers during their on-farm meeting of March 28-31.

To reach its full economic potential, the CPA must be able to provide adequate nutrition not only for its lactating cows, but also for weaned dairy calves (2-6 months), dairy heifers (females 6 to 20 months) and dry cows. It must also provide nutrition for bulls being raised for beef (6 months to market weight), the beef breeding herd (cows, calves and heifers) and its herd of water buffalo.

In summary, the CPA needs to provide nutrition for the following livestock on a year-round basis:

milking cows	45
dry cows	30
dairy heifers	62
dairy calves under 6 months	28
bulls	42 (normally)
beef breeding cows	61
beef calves	47
beef heifers	76

To accomplish this in an economically and environmentally sustainable manner, the nutrition for these animals should be produced on the CPA without the need for further inputs.

In part, that will be accomplished by the addition of further pastures, in part by the production of ration crops (protein and carbohydrates) and the on-farm formulation of feed rations.

In consultation with the farmers, a management plan was developed to improve forty hectares of farmland currently in low-productivity, dry land pasture.

Figure 1 represents the plan agreed to by the farmers (“Completion Project”). Figure 2 shows the relationship between the Pilot project and the Completion Project.

The Completion Project land was measured and staked in March, resulting in the following allocations:

additional rotational pastures (dairy)	13.2 hectares
young heifer pastures, pen, lanes	1.2 hectare
production of ration crops	11.8 hectares
grass forage trials	4.8 hectares
silvopastures (bulls)	6.5 hectares
forestry	3.2 hectares
access lanes, water line, roadways	1.6 hectares
TOTAL AREA	42.3 hectares

Irrigation System. The irrigation system will feed of a single water line that runs the length of the field (from silvo-pastures to forestry). The rotational pastures and ration crop production areas are the same width (250 meters) to facilitate inexpensive pipe irrigation running off either side of the central water line.

Rotational Pastures. The additional rotational pastures will again be constructed with electric fencing, but will be much less expensive to construct than those erected in the Pilot Project. This is because they will draw their electrical charge from the ample available power supply from the Gallagher fencer (installed in 2005) and also because the wire and posts needed to construct the fences can this time all be sourced in Cuba. Only a few materials (e.g. 4 turbo reels, some pig tails and lead-out wire for running power under the lane ways) will need to be sourced from Canada.

Young Heifer Pens. Designed by Gladys Millson, the calf pen complex will be placed near the calf hutches in the corner of the larger of the two silvopastures to allow a smooth transition for newly weaned calves. Calves will be age grouped to encourage healthy competition for food and ensure appropriate nutrition.

Calves from 12 to 14 weeks of age will share small pens (2-3 calves per pen, 3 pens in all, each 2 meters by 4 meters) and receive a feed ration.

Calves from 14 to 20 weeks of age will share larger pens (4-6 calves per pen, 2 pens in all, each 4 meters by 6 meters) and receive a feed ration plus some fed forage.

Calves over 20 weeks of age who are old enough to forage but still require a protein ration will share one large pen (10 meters by 6 meters in size) with access along an alleyway to a young heifer pasture.

Young Heifer Pastures (1 ha). A strip pasture for young heifers will be created on the silvo-pasture side of the top access road. This will be accessible from the heifer pens for animals over 20 weeks of age. The top few fields on the left side of the rotational pastures can also be allocated for heifers.

Production of Ration Crops (11.8 ha). This is the area where the carbohydrate and protein crops (e.g. corn, sorghum, soya) will be grown in rotation for subsequent on-farm formulation of feed rations. This area needs only irrigation.

Grass Forage Trials (4.8 ha). When we met with nearby Instituto de Ciencia Animal (ICA), they were very interested in having included in the pasture plan an area available for forage grass trials where different species of grasses could be tested for adaptability and nutrition during Cuba's different seasons of the year. The cost of supporting this pasture (basically seeds) would be the responsibility of ICA.

Silvo-Pastures (6.5 ha). Another priority of ICA, the inclusion of silvo-pasture for the bulls would round out the "sustainable model" by demonstrating the use of silvo-pasture (small legumous trees and grasses under a shade canopy of larger trees). This pasture will take a while to establish, and will require some irrigation in the establishment phase. The Ministry of the Interior has offered to support this phase of the pasture improvements. Needed will be some irrigation and or course seeds and small trees.

Forestry (3.2 ha). Wood is a commodity in critically short supply throughout Cuba. This small woodlot located on a corner of the pasture with poorer soils and many rocks will provide wood for fence posts, cooking and other uses of the CPA. By providing a natural habitat for small indigenous animals such as voles and raptors, this small woodlot will also enhance area bio-diversity.

To support the Completion Project, the following equipment is needed:

1. Irrigation pump and equipment capable of irrigating 25 - 30 hectares (rotational pastures and ration crop area) plus silvo-pastures during establishment phase.
2. Electric fencing supplies, the vast majority of which can now be sourced in Cuba (see "Morgan's Fencing List"). Much less costly this time, as electric fencers and solar panels not needed (ample capacity in the Pedestal/Pastures area constructed under the Pilot Project in 2005).
3. Ration-mixer. A blueprint for a simple ration mixer has been developed by Gladys Millson (Figure 3) and is presently being constructed at the CPA's workshop from materials at the CPA and hoses supplied from Canada.
4. Hay cutter. Needed to harvest grasses from forage trials area for direct feeding. A used Massey Ferguson hay mower was purchased by Jim Millson and shipped to the CPA in March.

### Yoghurt Manufacturing Facility

As a result of the changes to calf rearing practices (Women's Calf Brigade), calves will be soon weaned at 8-20 weeks of age instead of at 9 months. This means there will be a greater supply of milk available to the CPA.

A small portion of this extra milk could easily be used by the women running the calf program to produce nutritious yoghurt for daily consumption by CPA members, children at the local elementary school and by the elderly. With all of Cuba's plentiful tropical fruits, mango, banana, pineapple and other varieties of fresh yoghurt would be a healthy and welcome addition to the diets of the local population. This would also increase the importance of the contribution made by the women members of the CPA.

A small yoghurt manufacturing facility would be an ideal add-on to the CPA capacity. All that is really needed is a small preparation area, some sterile equipment, and a small warming/cooling unit. Lynn Manners, who traveled to Cuba during the January 2006 delegation, has volunteered to raise \$3,000 CAD to support this project.

### Milk Cooling Capacity

Darryl Donneral is working on a rustic system to provide cooling for the milk collected each day. Although not a priority now due to relatively small volumes, the need to cool milk to improve milk quality will become a greater priority as milk production increases and the CPA moves to twice a day milking. Presently, a system is being considered based on the temperature gradient between ground water and surface water. This would be an inexpensive, rural approach. There is no budget identified as yet, and this aspect of the work is merely "under consideration".

### FUNDING

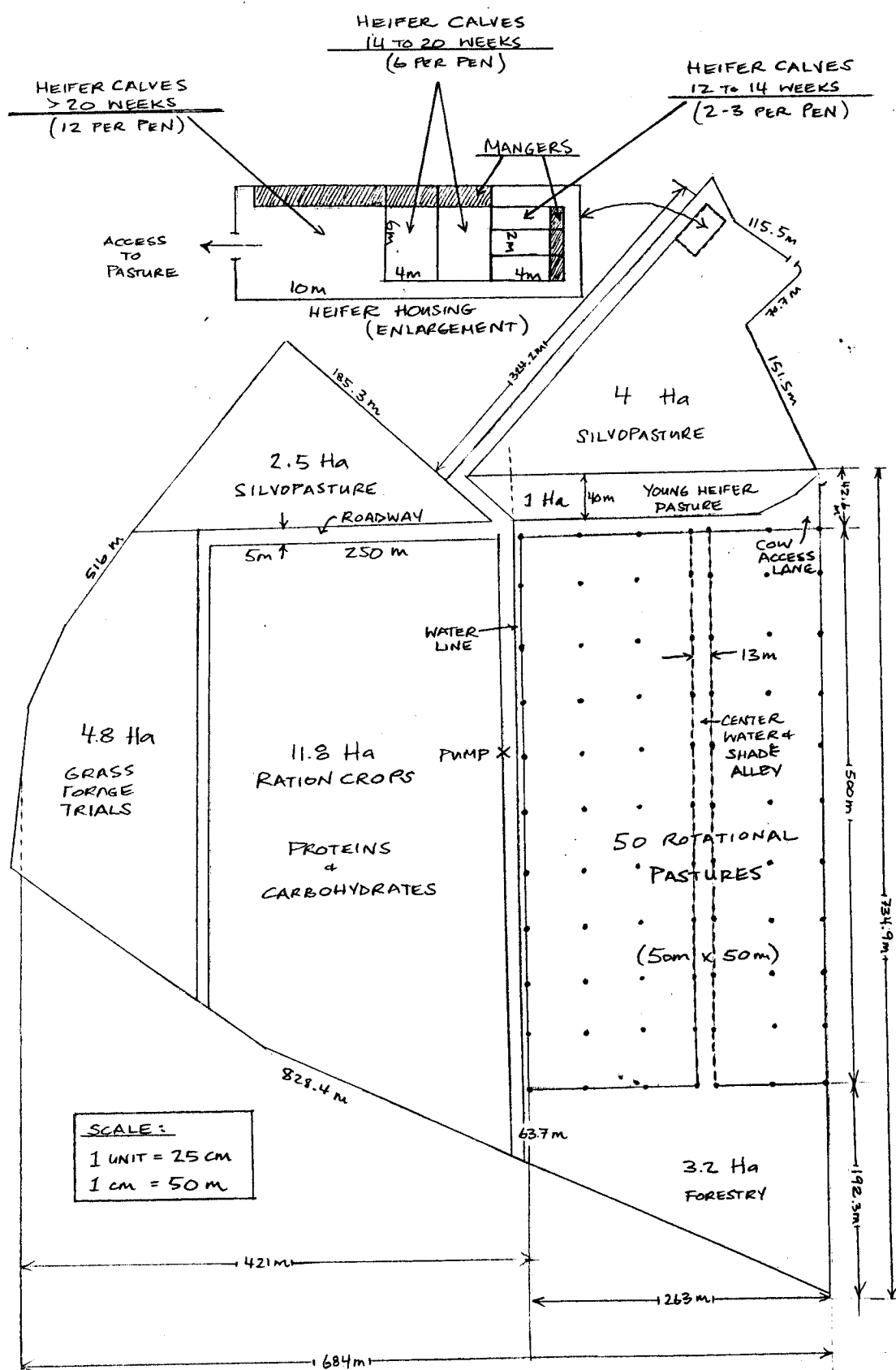
As noted, the relatively modest costs associated with improving the areas devoted to Forage Trials and Silvo-Pasture will be supported by Instituto de Ciencia Animal and the Cuban Ministry of the Interior, respectively. CIDA Country Funds of \$10,000 CAD may be available to purchase the irrigation pump. This would be applied for by ANAP. This leaves the balance of the irrigation system and the construction of the rotational pastures to be funded by Sustainable Cities.

The CIDA funding that supported the Pilot Project (Projects and Innovations, NGO Project Facility) cannot be accessed for the Completion Project because Cuba is no longer an eligible country under their funding mandate.

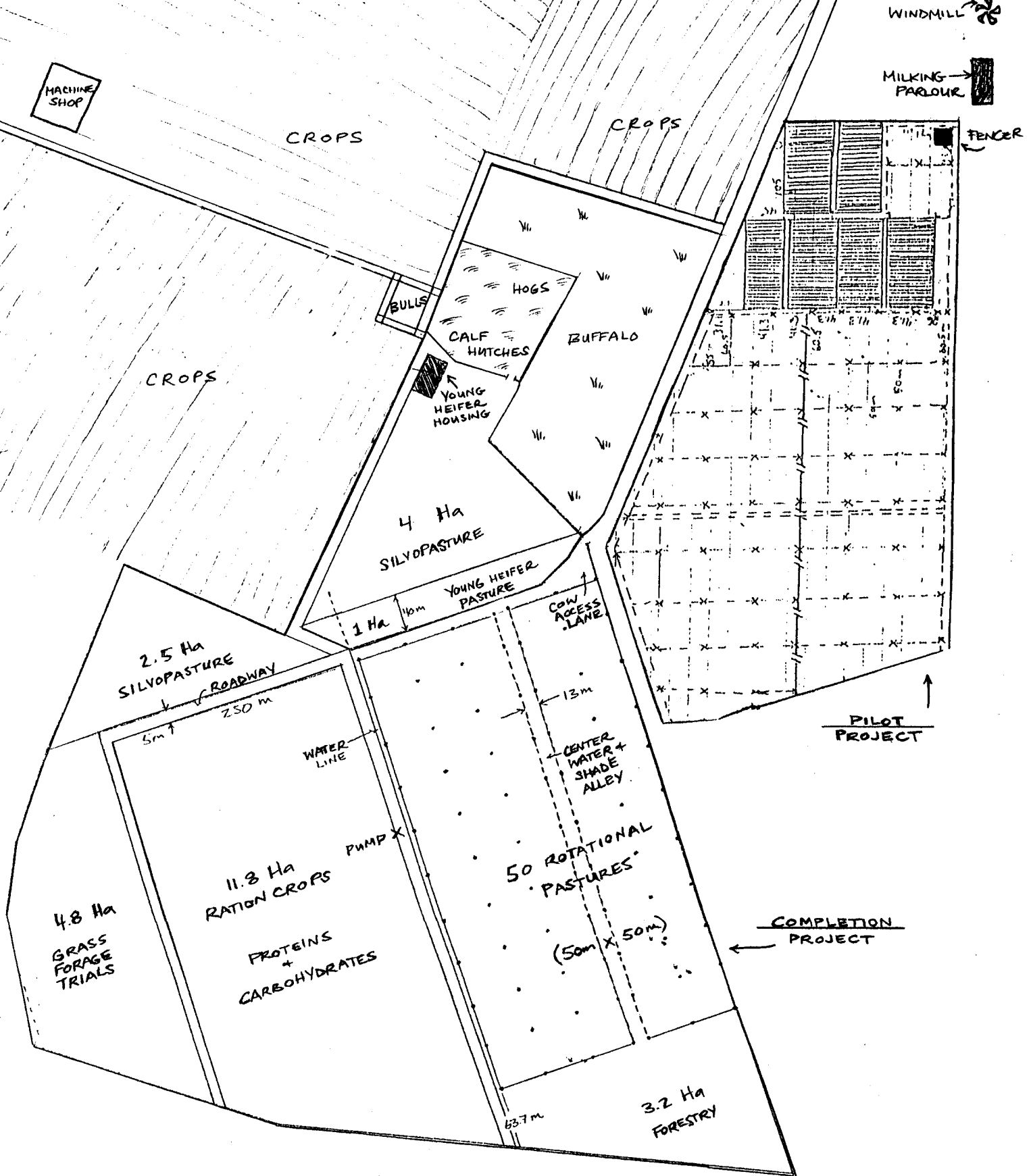
Consequently, the remainder of costs associated with the Completion Project will have to be raised by private donations. We anticipate a small budget to complete this work – perhaps 25 to 30 thousand \$ CAD.

### IN CONCLUSION

1. This CPA has great potential to serve as a national model for sustainable dairy production in Cuba. Please read "Farmer to Farmer Evaluation", Jim and Gladys Millson's evaluation of the work, presented in Appendix 1.
2. The relatively small (in costs) but important (in capacity) Completion Project will allow this to happen in 2006.
3. The collaborative links that have been developed with Instituto de Ciencia Animal (Institute of Animal Science) will be important in providing ongoing project support to the CPA in ensuring that high-protein, high quality seed is made available from IIPF (Instituto de Investigaciones de Pastos y Forrajes) for the creation of new pastures.



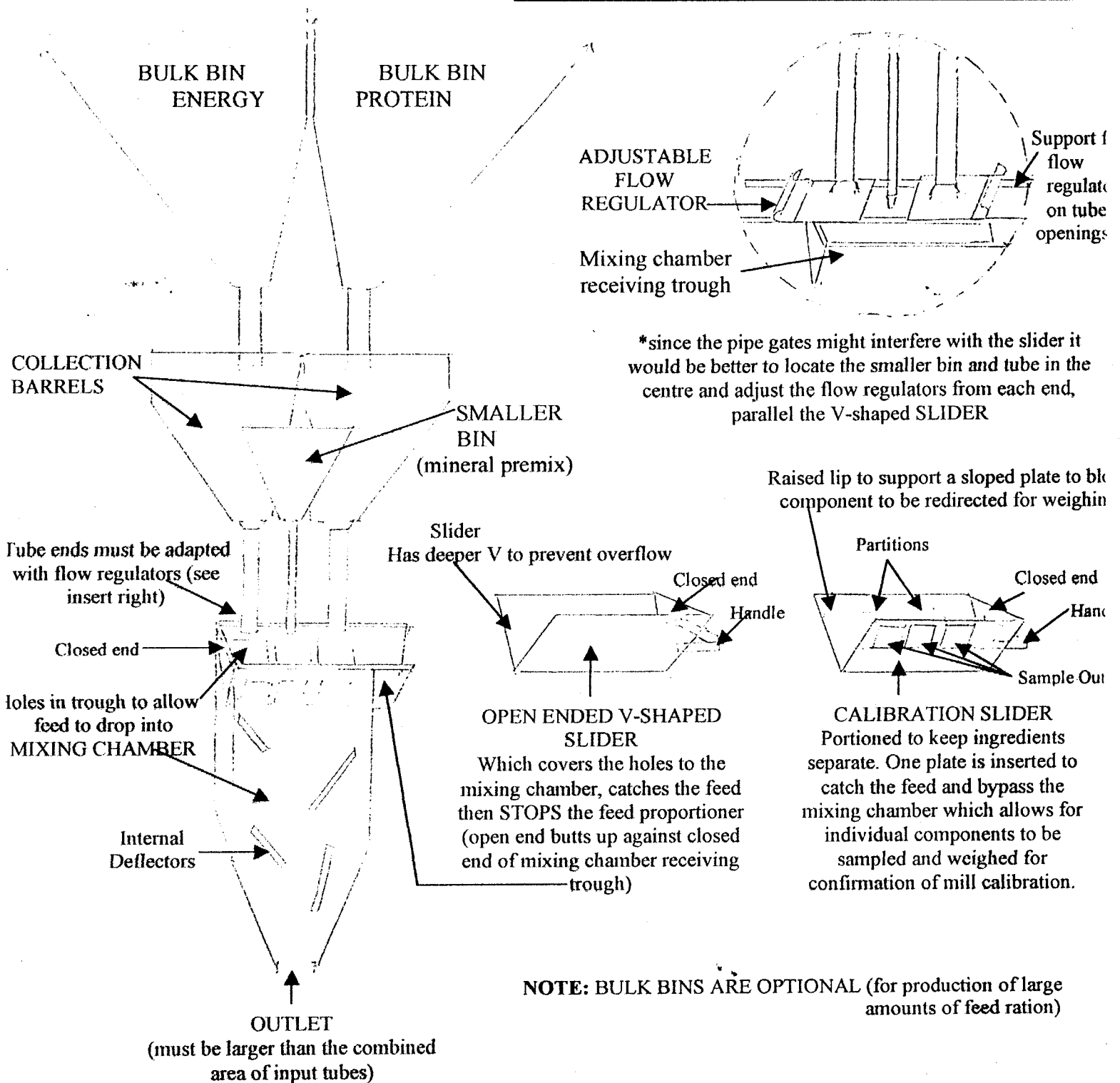
**FIGURE 1 - COMPLETION PROJECT**  
**CPA 26 Julio, Los Palos, Nueva Paz**



**FIGURE 2 – PILOT PROJECT AND COMPLETION PROJECT**  
 CPA 26 Julio, Los Palos, Nueva Paz

Scale: 1 unit = 20cm

**Gravity Flow Feed Proportioner And Mixer**  
**Gladys Millson – January 2006**



**FIGURE 3 – FEED RATION PROPORTIONER AND MIXER**  
**CPA 26 Julio, Los Palos, Nueva Paz**

**Morgan's Fencing Materials List  
CPA 26 Julio, Los Palos, Nueva Paz**

**Completion Project**

**April 18, 2006**

Materials Sourced in Canada:

Offset Insulators = 364 Order 385 @ \$2.36 = \$ 908.60  
(although Morgan thinks that they still have some left over in stock)

Pig Tail Treadins = 140 @ \$ 3.48 = \$ 487.20

Medium Geared Wheel (400m) 4 @ \$191.99 = \$767.96

Turbo Wire Spool ( 200m) 1 roll = \$ 54.79

Underground Leadout Wire 2 of 100m rolls = \$ 327.98

Permanent Fence Tighteners 2 bags of 25 ea. = \$ 201.98

Total Cost Canadian Gallagher Parts(2005 price) = \$ 2,748.51

Parts to be sourced in CUBA:

Rebar: 369 pieces 4 ft. in length = 1476 ft.

409 pieces 5 ft. lengths = 2045 ft.

Total Rebar: 3,521 ft minimum purchase

Wire: if 12.5 ga. 7550 m. (609 m. rolls) then about 12 rolls

Mother Posts: 60

Rebar Insulators: 1200

Super Strain Type Insulators: 120

NOTE: We want a solid barbed-wire and post fence dividing the silvo-pasture from heifer pasture and access lane, and along the bottom of the smaller silvo pasture keeping the animals from the crop land. (About 950 m. of fenceline.) There is budgeted in the above materials list enough offsets and wire to run an offset electrical line on the silvo-pasture side of the fence keeping the bulls from the heifers.





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## **FARMER TO FARMER EVALUATION:**

**March 2006 visit to CPA Julio 26**

**By: Jim & Gladys Millson**

### **MEASUREMENTS OF SUCCESS**

**“Enhancing Sustainable Dairy Production Capacity in Cuba”**

Before this project began, the mortality rate of cattle on CPA Julio 26 over the season of drought was typically, 30 to 40 deaths due to starvation. The mortality rate of cattle in the current season of little rain was “zero”. This dramatic drop, according to Juanito, is directly attributed to the benefits of the project and more specifically the feed provided by the initial growth of the pedestal grass and the irrigated growth of King Grass Pasture.

A farmer’s first responsibility is to the health of his animals. If we look after them well, they will look after the finances of the farm. One cannot ask a farmer to feed for increased milk production while other of his animals are starving. The first priority is survival. An animal that lives will breed and produce offspring who will further contribute to the productivity of the farm.

**Reducing the death rate creates a more rapid rate of natural herd expansion and thereby increases total milk production capacity.**

**During our recent visit, Juanito mentioned how pleased they were with the good price they had just obtained with their marketed beef herd. This indicates that CPA Julio 26 bulls were most likely in better condition than their competition. Possibly, this can be attributed to the additional feed which became available once the irrigated pastures & pedestals began to produce King Grass forage. Juanito did a good job of managing his available resources for optimum return.**

**In spite of the fact that all of the rotational pastures have not yet been seeded or irrigated, and in spite of the fact that the missing pedestal fencing has delayed their intended function—Juanito has hand harvested Glycinia Seeds to use in subsequent plantings and with the use of a machete, they have harvested King Grass which has benefited from irrigation and fed it out for maximum results. Although a significant, measureable increase in milk production may not yet have been realized, the building blocks for the foundation of a large scale, sustainable dairy production system have been well established. The project is sustainable because the plan has taken root. “Si, se puede!”**

**As further productivity of irrigated pastures are realized, some of the large number of acres currently in pasture (previously required to carry the herd through the season of drought) can now be irrigated and allocated to crop production. This will allow for the production of a protein/carbohydrate ration which will further contribute to the welfare of the animals and increased milk production.**

It is to be expected that the first year of the implementation of the project will not yield immediate large increases in milk production. The calendar of change for an agricultural enterprise is not measured in days, weeks or months but rather in crop seasons and lactations. This has created somewhat of a challenge since the project funding was for one calendar year. One must be patient but we certainly see measurements of success which promise large benefits in the next two to three years. CPA Julio 26 has made incredibly rapid strides towards the goal of sustainable milk production capacity and this is mainly attributable to their willingness to embrace change under the management of a brave and progressive leader—Juanito.

Of course, none of these accomplishments could be realized without the very capable direction of our team leader—Wendy Holm, who somehow manages to co-ordinate the bureaucracy with incredible efficiency while working along side the Cuban and Canadian Farmers. She is intimately in touch with what is happening on the ground and in the field—always keeping the project goals in perspective.

As farmers observing farmers...

Juanito and all of the members of the CPA get an A<sup>+</sup> !

Sincerely,

Jim & Gladys Millson

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