

Project R6138 (XO277)

SMALLHOLDER MILK PRODUCTION

Natural Resources Institute (NRI)

Department of Research and Specialist Services (DR&SS)

(Matopos Research Station)

Site visit, 15th-18th January 1997  
by T Smith (former project leader).

## Background

In January 1991 an exotic dairy bull (Jersey) was purchased, by Matopos Research Station, to cross with indigenous (Nkone and Tuli) cows. The objective was to evaluate crossbred cattle, for milk, draught and meat output, in readiness for an expected interest by smallholders in dairying in semi-arid areas (with a time lag of up to four years from first mating to the production of milk from the F1). Current shortages of cattle and feed are reflected in shortages of milk and other dairy products.

The need to evaluate the male calf was seen as essential, given that a major reason for keeping cattle by smallholder farmers is to meet their draught power requirements

Recent predictions of population growth suggest a doubling by the year 2020. This has implications for the intensification of livestock production systems

A preliminary report on this stage of the project was made in 1994 (Smith, Moyo, Beffa, Ndlovu : Proceedings Danida Workshop, Harare).

In the late 1980s SADC/ICRISAT developed a programme to evaluate *Pennisetum* hybrids as a potential forage source for semi-arid areas. This was handed over to the Department of Research and Specialist Services in the early 1990s, with a strong input at Matopos Research Station

In early 1994 Matopos was invited to submit a concept note regarding forage evaluation for smallholder dairy production to Natural Resources Institute (NRI). The resulting project was given funds for 1994/1995, and 1995/1996. In March 1996 a

request for funds for running expenses for 1996 to 1997 was accepted

The funding was used to amalgamate part of the forage programme with the smallholder dairy project, thus enabling the forage constraint to milk production to be addressed. The funds were used to establish and run a forage garden (1.2ha) and to construct and run a dairy infrastructure for feeding and milking. All the installations used materials and technology available to smallholders

Quarterly and Annual Report have been submitted to NRI and appear in the Annual Report of the Division of Livestock and Pastures (Department of Research and Specialist Services). A progress report was presented at the All Africa Animal Agriculture Conference Pretoria, in April 1996 (Smith, Ndlovu and Mhere) (proceedings)

The reasons for this visit were

- 1) No member of NRI had been able to visit the project since funding started in 1994
- 2) Three projects, tentatively approved for funding in 1997 to 2000, quoted this project as a foundation study for the new work. These projects were subjected to a separate review mission (20th-24th January, 1997) (Drs J Morton and T Smith).
- 3) The original project leader (T Smith) had left the site on completion of his contract with the Government of Zimbabwe (April, 1996).
- 4) The manager of the dairy unit (K Ndlovu) resigned in September 1996.
- 5) Direct funding ended on 31st March 1997.

Because of planned involvement of this site in running future projects it was prudent to ascertain its future whilst in Zimbabwe to review implementation of the 1997-2000 projects.

### Forage Programme

Details of agronomic studies are reported by the researcher (O Mhere). Of the four lines established in late 1994 (Bana; SDPN 3, 29 and 38) two will now be dropped: SDPN 29 because of insufficient yield; SDPN38 because of signs of frost damage.

Although establishment was difficult, because of the irregular rainfall pattern of 1994-95, subsequent performance of Bana and SDPN3 have been good, both in terms of yield and acceptability to cattle. Full irrigation is not available at this site (it is on other sites on the station) but strategic watering was possible.

A trial batch of silage, made in March 1996, was readily eaten by cattle in Sept-Oct. However, there was some rat and insect damage, suggesting a lined pit and greater compaction were necessary. The exercise will be repeated in 1997, with milking cows receiving experimental silage in 1998 (this programme is tentative).

A preliminary attempt to make hay (1995) failed because of the thick stems of the pennisetums. No method of "crimping" or "conditioning" was available and although racks were used, complete drying did not occur.

## Crossbred Cattle Programme

Detailed reports have been made by the project leaders (T Smith followed by Mrs S Moyo). Whilst at the site the reviewer took part in discussions of future management, and a number of decisions were agreed to.

- 1 Confidence was expressed in the new manager (Mr L Mpofu). He joined Matopos staff (1991) as a certificate holder and has recently (1996) completed his diploma in agriculture.
- 2) It is planned to evaluate three of the forage lines (Bana, SDPN3 and 38) with dairy cows in two 3 x 3 latin square design trials. The possibility of measuring intake and digestibility on two or three animals per forage, and splitting the remaining animals into three groups, one group to receive each forage was discussed. Because of good rains there is ample forage available.
- 3) The choice of bull for F2 heifers: All F1 stock have been bred to a Jersey bull. Because this class of stock (F1) has proved capable of surviving, both on and off station, there is little point in producing females with less than 50% Jersey blood. The upper inclusion limit for Jersey blood has not been established (with good management it will be near 100%) for smallholder cattle. The F3 would be 87.5% Jersey. This was the option decided upon (there is no intention of producing a composite breed).
- 4) Seasonal production (based on a fixed breeding season) is still practised, because of the forage deficit in the dry season. Currently there are a total of 52 F1 and F2 females of various parities ready for bulling. Labour and financial constraints suggest cutting the herd down, but it was requested that all females should be bred so that the project proposed by Dr P Ball would have the option of

using this pool of cattle. This was agreed to. If Dr Ball does not take his option, surplus stock will be sold to smallholders

At the outset of the project, heifers were calved for the first time at two or three years of age. Whilst the older animals gave more milk, the problems of keeping animals empty, especially in a communal system, have resulted in all heifers being bred to calve at two years of age

During the current season peak yields of 11 litres/day have been recorded. At present it looks as though lactation yield will be greatest in the third lactation animals, followed by the second and first respectively.

### Outreach

Crossbred cattle, from the station herd, are located at three sites (Mjele, P Kempadoo, Hlekweni Training Centre). Forage (Bana grass and SDPN3) has, or is, being transferred to these sites plus three others (Ekuphileni Smallholder Dairy Project, Irisvale, Natisa). Cows (indigenous) are being milked at Ekuphileni and Irisvale.

Two farms, belonging to members of Ekuphileni, were visited: on the first, the farmer (Mrs Ngwabi) has planted Bana on six of ten contours in her arable land and she milks four cows, surplus milk being sold at the local store. Her current cash income from milk is approximately Z\$15 per day. On the second farm, Mr & Mrs Ncube are currently establishing their plot of Bana and milking one cow (cash income +/- Z\$8 per day). Some of this milk is sold fresh and some soured.

Reports for Ekuphileni and Mjela are attached. Mr Kempadoo visits Matopos frequently and is preparing his annual report (in discussions he reports that the group now have nine cows in milk and own Jersey bulls, which move between sites). Hlekweni Training Centre was contacted by telephone and reported progress. Irisvale is likely to be accepted as a Dairy Development Project (DDP) site, if the second phase of this programme is approved (for outline of DDP report of the Review Mission to Zimbabwe, J Morton and T Smith).

Affiliated groups are continuing to send members to Matopos for training in dairy and forage husbandry techniques. Students work for two to three weeks, unpaid, and are given instruction in routine operations. Some 25 people have taken advantage of this and there is a waiting list (maximum of three at any one time).

Agritex was asked to ensure that the Mjela group plant their Bana grass during the remainder of this 1996/1997 wet season. They must also sort out the breeding of their crossbred dairy stock as a matter of urgency. The distance of this site from Bulawayo is causing problems of control because of current restrictions on the use of government vehicles

The interest, demonstrated at the NRI sponsored Field Day in March 1996, in smallholder dairying, has resulted in requests for more on-farm involvement, especially in Matabeleland North Province (at present all off-station sites are in Matabeleland South, with ease of access to Matopos).

Availability of animals, future breeding and water are the major constraints. The market is good for liquid milk at present. Should this become saturated processing (souring) is an

alternative, thereby increasing shelf-life of the distance milk can be transported. Soured milk products are popular.

### The Future

Current interest in milk production suggests that the project should continue and develop. If the facility is to be actively involved in the projects of Drs Ball and Titterton between 1997 and 2000, then the immediate ability to function is guaranteed for the period. However, the outreach aspects of this programme also need developing. The current project leader is also acting head of station and is responsible for two large projects of her own. There is little possibility of an extra research officer in the near future.

It is recommended, therefore that funding be sought to:

- 1 Support casual labour to milk and feed cows (1100 man days per year).
- 2) To employ outside technical co-operation (part-time?) to support the project, through the head of station.
- 3) The outreach and on-farm studies should increase, the approach to be formalised with greater supervision from extension and research
- 4) Supply of a vehicle: items (2) and (3) above make this necessary.
- 5) A PhD project to be developed. This could be in dairy management or systems. The student could be regarded as a counterpart to take over at the end of the project. The Technical Co-operation Officer would act as local supervisor.

Responsibility for developing and seeking funds for such a project rests with Matopos Research Station and the Department of Research and Specialist Services

### Funding

Due to the changes in senior staff on the ground, the allocation of funding has suffered during the 1996-97 financial year.

A transfer of £2920 from NRI on 6/11/96 was converted into Z\$57994.15. However, this money was not credited to the project until the reviewer visited DR&SS on 15/1/97. By that time the station had spent some Z\$23000 its from government allocation to keep the project moving. Reimbursement will now be paid. The Matopos Keldha room needs refitting (costs Z\$24000) and it is recommended the funds be used for this. Dr Titterton's and Dr Wood's work, and to some extent Dr Ball's, will need routine nitrogen determinations; other station projects are currently delayed. The remaining funds in Zimbabwe should be sufficient for running costs until 31st March 1997 and to cover the shortfall of Z\$8000 from 1995-96.

The balance of the money held by NRI (£2870) is requested by the station for the purchase of:

- 1 A computer and printer planned for 1995-96, and not purchased, for the forage programme. This would release funds to relieve budgetary constraints in Dr Titterton's planned programme. It would also be a contribution to maintaining and upgrading the Matopos computer capacity.

- 2) To purchase 1997 CAB abstracts (Forage and Pastures; Animal Breeding; Nutrition). Needed by NRI project staff (value to all research staff acknowledged).
- 3) Balance for chemicals to complete analysis of forage programme samples.

### Conclusions and Summary

- 1 Justification for the project is confirmed by increasing interest and awareness by farmers in producing milk from cultivated forage
- 2) The Jersey crossbred has proved itself capable of surviving and being productive (milk; draught; meat) on and off station.
- 3) Population increase predictions make it imperative to seek methods of increasing agricultural production from smallholdings, especially from livestock, where there has been little improvement since 1980. FAO figures suggest that per capita consumption of protein of animal origin is above 11g/day in Zimbabwe (developed world 28g).
- 4) The physical facilities and expertise generated under this project will contribute to planned NRI funded work (1997-2000).
- 5) Further funding should be sought to continue the momentum started under Project 6138 (X6277). In particular outreach activities need increasing and formalising.

Programme and People Consulted

Tuesday 14th January 1997

T Smith flew to Zimbabwe.

Wednesday 15th January

T Smith arrived in Zimbabwe

Discussions with:

Dr N R Gata (Director, DR&SS) (outlined purpose of visit,  
agreed to report back)

Mrs Nyazaume (Senior Accounts Officer, DR&SS)

Dr M Titteron University of Zimbabwe. Progress of  
forage work (current trial)

Mrs B Maasdorp and registration of O Mhere at  
University of Zimbabwe for MPhil  
studies

Travelled to Matopos.

Thursday 16th January

Visited dairy unit (Umhlonyane) for on-site discussions with:

Mrs S Moyo (Acting head, project leader)

O Mhere (forage officer)

M L Beffa and S Ncube (Principal Research Officers)

L Mpofu (Manager, Umhlonyane)

Visited farms of Mrs Ngwabi and Mr & Mrs Ncube (Enkuphileni  
Smallholder Dairy Project)

Discussions with O Mhere regarding 1996-97 programme.

Friday 17th January

Discussions with:

Ms S Ngwabi (Agritex Mjela project)

O Mhere

Beffa/S Ncube

S Moyo (report back

T Smith

for NRI