

## *Summary of the Discussion*

**L. 't Mannetje**

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During the conference there were some welcome comments from participants which can be summarised under three main headings.

### *Silage making in the tropics, problems of adoption*

In the Introductory paper 't Mannetje (Paper 1) raised some doubts about silage making in the tropics, which stirred several participants to agree or to disagree.

Peter Wollesen, writing from experience in Zanzibar, Somalia and Indonesia mentioned that smallholders in these countries have excessive amounts of forage available in the wet season in the form of grass and foliage as well as various crop residues and by-products at the end of growing season. In order to preserve these feedstuffs, ensiling or urea treatment would be necessary, but smallholders are not doing this to any extent because of problems of airtight and watertight storage, with plastic sheeting being too expensive. The use of plastic bags or plastic lined empty oil drums would offer a solution, but these and machinery for chopping are also expensive. Furthermore, the effect of the improved feeding strategy is not readily seen in the production of milk and meat and that discourages the smallholders from continuing. Gilles Stockton (USA), also having worked in Somalia, found that there is a variety of forages during the rainy season, but a shortage during the dry, despite the fact that the price of milk increased substantially at that time. He does not understand why fodder conservation is not practised.

Miguel Velez agreed that silage is the best choice for conserving forage in the tropics, but disagreed on other points regarding the need for silage making in the tropics. He wrote that for the intensification of livestock production in the tropics, forage conservation is a must in most areas. Not only to improve milk production, but also for the fertility of the cows. Without good feeding, livestock improvement is impossible. In tropical regions with an extended dry season, supplementary feeding is necessary. According to him farmers should not only conserve excess forage or crop residues, but they should plan to ensile forage early in the growing season.

t Mannetje advocated ensiling sorghum or maize rather than tropical grasses with their low feeding value and low soluble carbohydrate contents, but Velez remarked that the crops require annual planting, pesticides, heavy machinery for harvesting and chopping and level land to avoid erosion. Boonman agrees with this. He considers the promotion of "special-purpose-fodder-crops" as a major impediment to silage making. These are full-season crops that compete directly with the land needed for cropping. Many farmers find the ensiling of staple food crops objectionable. Most important, however, mechanised maize silage making can be so expensive that it is cheaper at times to harvest and feed the grain.

Wolfgang Bayer (Germany) found that the smallholders he has dealt with (Africa, India, Eastern Europe) make hay quite often even in very laborious ways, such as drying on a roof. Hay can be stored and transported more easily than silage. Boonman also makes a strong plea for haymaking, which he finds, is not as problematic in the tropics as many believe. He considers that conservation of surplus grass provides fodder in the dry season and maintains a young, green sward in periods of excess growth.

Bayer pointed out that animals kept for manure basically have to survive, whilst draft animals, sometimes used only for several weeks or months need not be fat. These types of animals can also afford to lose weight in the dry season. When resources are scarce, silage making may not be a good proposition, because of the costs and losses involved.

Wong Choi Chee from Malaysia agreed with the introductory paper, but pointed out that there is much low-value fodder in the form of rice straw and oil palm fronds (Wan Zahari *et al.* , poster 6P2), which will either be lost or can be ensiled or treated with urea to preserve them for later use and improve their quality. However, there is no adoption of the technology. He wonders whether the technologies generated are not relevant to the livestock farmers, or that the target group should be the more progressive farmers who are willing to put some investment into it?

Suttie remarked that the technology is available, at least for mechanised farms, so why is tropical silage not more widely used?

The problems of adoption of silage making technology were extensively dealt with in a poster from Pakistan (Syed Hassan Raza, 2P3) and in comments by Rangnekar from India and by Andy Safalaoh, working in Malawi. The main constraints are listed in the closing paper ('t Mannetje, Paper 10).

Boonman reminded us that farmers have done more for the development of new technology in livestock farming than scientists have. He blames the lack of cutting tropical pastures as a management tool in forage production on the reluctance of legume-oriented scientists to cut grass-legume pastures. In his opinion legumes cannot stand either cutting or grazing and therefore the proponents of legumes do not recommend silage making.

Elaine Lanting from the Philippines observed that the benefits of silage cannot be overemphasised. This is particularly true in commercial cattle feedlot operations and in dairying where it has great economic benefits. However, in smallholder farms where livestock fodder such as crop residues and weeds abound and can be used conveniently without costs involved, silage production/utilisation has not found its place. In some areas, though, where green corn is the major product and farmers raise two or more ruminants or in small-scale dairying, silage may find its niche in smallholder farms.

Poornima Vyasulu working with a farmwomen project in Bangalore presented a very good case in point about the introduction of silage making to smallholders. In the first instance she sought advice from the conference on silage making, as she is not familiar with farming practice. The main activities of the project are training women in agricultural techniques, extension services, organising them into groups to support each other, buy farm inputs and obtain help from other government departments. Most women have holdings of 2-5 acres; most are in rain-fed areas and practise 'complex, diverse and risk-prone' agriculture as a family livelihood. They are economically in the lower stratum, mostly illiterate and vulnerable. She wondered if silage making would have a place in this situation. She received plenty of advice. Wong Choi Chee commented that small holder farmers in Philippines did not adopt silage making because it involves cost and that she should first find out if silage making would be an option for these women. Rangnekar pointed out that she should see if the level of milk production of the animals was adequate to respond to better feeding and if there is surplus green fodder available. Unless the women have better producing animals they are unlikely to spend time and money on such technology.

Poornima Vyasulu replied that the conference had given her a steady stream of very professionally presented material on silage. She has begun to see some of the issues involved in silage making: the scale of operation, utility, suitable materials, processes, nutritional value, location-specific variations etc. She can now understand why farmwomen of small holdings have not taken to it so readily. Rural women apply very calculative cost-benefit analysis to everything they do and the way they perceive costs and benefits are not so easily discernible to us! She does not believe in 'pushing' any technology on farmwomen. Her approach would be to offer them information on a potential technology, assist them in adoption if needed but let them choose to do so.

### ***Silage from tropical grasses and legumes***

Marion Titterton and Felix Bareeba (Paper 4) introduced silage making from tropical grasses and legumes, which also elicited comments by Chris Regan who has had much experience with silage making of mixed legume-grass pastures in northern Australia. His general practice is to wilt to between 40-55% DM before baling and wrapping.

### ***Techniques of silage making for smallholders***

Smallholders do not favour pit or trench silos and stacks on top of the ground because it is difficult to cover them so that they are airtight and to keep the water out. To avoid these problems bags, containers and wrapping of small bales are being advocated.

Ian Lane, who worked in northern Pakistan and in Nepal presented a poster on Little Bag Silage (8P2) and Shariffah Noorhani from Malaysia on wrapping 30 kg bales (8P1) of grass for smallholder livestock. Although this "sila-wrapping" is very convenient, the problem is the cost of the machinery, and rats tend to chew the bales, spoiling the silage. Chris Regan commented that this would be a good case for cooperation between smallholders or for someone to wrap bales at a small cost. In northern Australia the cost came to Aus\$ 0.85 per bale. Bales are also handy for selling them to farmers, who do not make silage themselves.

## ***References***

Lane, I.R.. Little bag silage, Poster 8P2.

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Wan Zahari, S., Oshio, M., Mohd Jaafar, D., Najib, M. A., Mohd Yunus, I. and Nor Ismail, M.S. Voluntary intake and digestibility of treated oil palm fronds, Poster 6P2.