

## ***Electronic Conference on Tropical Silage Final Remarks and Analysis of Questionnaire***

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### ***The Conference***

The Electronic Conference on Tropical Silage ran for just over three months from early September into December 1999. Altogether there were some 355 subscribers from 68 countries [Participants by FAO Region - Africa: 28; Asia 40; Europe: 72; Latin America and the Caribbean: 148; Near East: 7; North America: 20; Southwest Pacific: 25 and Unspecified: 15].

There were 10 main papers and a paper summarising the discussion, as well as 26 posters. These are now available on the FAO Grassland and Pasture Crops Group Homepage <http://www.fao.org/WAICENT/FAOINFO/AGRICULT/AGP/AGPC/gp/SILAGE/Home.htm> and the Proceedings will be published in due course.

Details of the countries (by FAO region) of subscribers and contributors (papers and posters) are given in the table below.

### ***The Questionnaire***

61 completed questionnaires were returned by the cut-off date. Assuming all participants received the questionnaire this

represents a return rate of just over 17%. Details of the countries (33) from which completed questionnaires were returned are given in the table below. The returned questionnaires have been analysed and results are presented below under three headings: Details of Participants, The Conference and Silage Making.

### ***Details of Participants***

Participants were mainly male (90%), in the 31 - 50 year age group (61%) and predominantly academics (34%), researchers (26%) and consultants (16%).

#### **1. Gender**

Male: 90%  
Female: 10%

#### **2. Age Group**

< 30 years: 8%  
31-50 years: 61%  
> 51 years: 31%

#### **3. Occupation**

Farmer .....3%  
Extension Officer.....3%  
Teacher.....5%  
University Lecturer/Reader/Professor...34%  
Consultant.....16%  
Policy maker.....1%  
Other .....38%\*

[\* including Researcher: 26%; Postgraduate Student: 5%; Retiree: 3%]

**Comment:** A number of respondents ticked more than one box, as they were, for example, both lecturers and consultants.

## ***The Conference***

Most participants were happy with the duration of the conference and the interval at which papers were posted (84% and 94% respectively). Although 97% indicated that the main papers covered their main interests in silage making, several respondents would have liked more information on smallholder silage production with the focus on practical case studies and economics. 43% mentioned that they learned something from all or most of the papers, 18% did not answer this question while others listed a number of specific papers, which they found particularly interesting. 98% of respondents were satisfied with the sending of papers by e-mail and their posting on the website. Although the Proceedings will initially be available in English, the language preference if the Proceedings are translated in future, remained English (72%), followed by Spanish (22%) and then French (5%). This may, however, not represent the actual need on a worldwide basis.

### **1. Duration**

Too Long: 13%

Just Right: 84%

Too Short: 3%

**Comment:** One respondent would have preferred a longer conference to discuss work in progress on silage.

### **2. Paper Interval**

Too Frequent: 3%

Just Right: 94%

Not Frequent Enough: 3%

### **3. Main Interest Covered**

Yes: 97%

No: 3%

**Comment:** Several respondents would have liked more information on smallholder silage production and economics; practical case studies on smallholder scale silage making, extension and technology adoption and silage making as part of the farm system.

### **4. Most Interesting Papers (s)**

18% did not answer this question while 43% mentioned that they learned something from all or most of the papers. Where individual papers or posters were mentioned the five most frequently listed were:

"The future of silage making in the tropics" - 't Mannetje

"Grass and legume silage in the tropics" - Titterton and Bareeba

"Silage fermentation processes and their manipulation" - Oude Elferink et al.

"Little bag silage" - Lane

"Use of ensiled forages in large scale animal production systems" - Cowan

### **5. Satisfied With E-mail and Website**

Yes: 98%

No: 2%

**Comment:** The one negative comment related to problems with a PC.

## **6. Language of Proceedings**

[Initially in English, but if translated in future, preferred language]

English: 72%

French: 5%

Spanish: 21%

**Comment:** One respondent listed Portuguese and several mentioned both English and/or Spanish. One respondent noted that as co-ordinator of an international course on tropical animal production and health attended by veterinarians and agronomists from French speaking countries, a French translation of the Proceedings would be welcome as there is much good material.

## ***Silage Making***

### **1. Silage making in respondents' area** (type of activity - large farm or smallholder)

Yes: 77%

No: 20%

**Comment:** 3% did not answer this question.

As replies came from respondents in developed and developing countries then answers tended to vary accordingly. In most of the developed countries silage making was widely practised on both large, medium and small farms (round bales and plastic wrap technology in addition to pit and tower silos) and both in the dairy (mainly) and beef sectors. In developing countries silage making was mainly restricted to some of the larger (dairy) farms, although it was noted in Thailand that in year 2000 it is hoped to demonstrate silage making to 600 smallholders. In Kenya where 80% of the milk is produced by smallholders it was recognised that there is a need to encourage greater adoption of silage (and hay) making.

## **2. Future of silage**

### **(a) Suggestions for increasing the uptake of silage making technology**

#### **Silage making:**

- find least cost, simple technologies, reduce costs and labour demands and make greater use of crop residues;
- reduce the negative impact of bad silage making by ensuring that basic principles of good silage making are understood and applied;
- reduce the moisture percentage before ensiling materials, use high quality materials and focus on grass/legume silage because inputs likely to be much lower than maize/sorghum and other silages; several respondents noted that the simple and cost free process of wilting the source material prior to ensiling greatly enhances the quality of the silage and rate of success; farmers have often had poor experience because the material has been too wet;
- promote the use of molasses with tropical grass silage;
- focus on by-product silage production with simple technology (and variable formula depending on resources available) to ensure continuity of feed supply in dry season (with benefits through more income, food security and less environmental pollution).
- research for the development of silage making technologies should be conducted with farmers;
- intensify participatory research especially in silage additives and machinery;

- need techniques for production of small quantities of silage (e.g. little bag silage ) which are practical and easy for small farmers to use and which can be developed in co-operation with the farmers to suit both their environments and resources.
- in some countries there may be scope for the development of silage making by smallholders for selling on to other farmers, peri-urban dairies etc. In Pakistan it was suggested that silage making needs to be commercialised; several respondents suggested that because of the costs involved there was a need for government sponsored silage making projects. In the Northern Territory of Australia there might be scope for smallholders to produce and sell small bale silage, but likely to need silage contractor service to provide machinery on contract basis when needed.
- some countries identified specific research needs such as Malaysia where focus is needed on the promotion of oil palm frond silage for beef and milk production.

### **Dissemination of knowledge:**

- more extension and demonstration;
- better training of extensionists in silage technology since they are the key to better diffusion of the technology.

### **Technology uptake:**

- need for greater focus on participatory methodologies when introducing such technologies on farms;

- strengthen research-extension-farmer linkages;
- more active information campaign and participatory approach in technology delivery - need to demonstrate success stories;
- farmers can learn from other farmers and other countries by seeing success stories for example on video;
- make more comprehensible to smallholders so they can see that the economic benefits are sufficient to justify labour and other inputs.

## **General**

- need to be able to demonstrate to farmers that well made silage pays off in increased returns;
- only target at medium to large scale enterprises where economic conditions are favourable and farmers are more likely to adopt technology than small scale mixed farmers;
- doubtful if smallholders will make silage to any extent but will use if available. Silage has to be a portable commodity;
- farmers must first see a need (e.g. long dry season) and have on-farm evidence that feeding silage to livestock will result in benefits (i.e. economic returns);
- some respondents suggest that the technology is there and there is need to apply and adapt in various situations (by farmers themselves);

- collection of case studies where silage making techniques have been adopted by smallholder farmers and develop a list of pre-conditions before silage making techniques can be expected to be adopted by smallholder farmers.

**(b) Suggestions for priority actions (and by whom)**

- research organisations to evaluate technologies and the benefits of silage making/utilisation under appropriate farmer conditions before widely recommending technologies; in particular look for simpler and less expensive methods of silage making for smallholders; costing of silage making is a very important area and there is need to identify where silage making is profitable (and be aware that use is likely to be tied to the accessibility to farmers of high value markets for animal products to compensate for the cost of inputs required);
- more on-farm demonstrations, however, these should only be undertaken by well trained extension staff;
- training courses on silage making techniques resulting in better trained extension workers, particularly in participatory methodologies;
- production of better extension materials;
- extension services/research organisations to review silage use and identify milk producers who could benefit from extension of silage; use participatory techniques to better define feed problems of target farmers; participatory trials at farm level for silage demonstration, especially with progressive farmers/model farmers;

- demonstrate that silage making can be an income generating activity for non-farm groups (income generation groups);
- strengthen research-extension-farmer linkages;
- local government officers/extension service to take the initiative to demonstrate methodologies and benefits of silage making and establish pilot projects to demonstrate to farmers;
- in smallscale crop/livestock production systems emphasis should be on use of crop residues and agro-industrial by-products; agriculture ministries to survey types, quantities, quality and seasonal availability of by-products and current level of use. Then practical programme of research and extension to demonstrate a range of model feeding systems based on ensiled by-product utilisation;
- industry should improve machinery for wilting and fine-chopping and also develop equipment for small-scale operations;
- work is needed to clarify which of the many additives are actually useful;
- FAO to further develop little bag silage technology;
- future research to evaluate enzymes as silage additives for forages that are difficult to ensile or low in digestibility;
- make a record of various case studies which demonstrate the technologies and practice of successful silage making/uptake by farmers;

- government assistance may be needed in a number of countries to provide the necessary infrastructure and establish silage-making industry;
- FAO to publish Proceedings of the electronic conference in different languages to ensure information widely available.

### **3. Other comments (on the Conference)**

- although in-depth analysis was lacking the conference has been very useful for extension workers;
- very useful and successful conference; this should be repeated in 2002 (and conferences on other topics held);
- excellent information in this conference on principles of silage making BUT really need another conference to focus on the "practicalities" of getting smallholders to try out the technology. Need for case studies of where villages/smallholders have successfully tried out silage making, with details of costs and benefits. This comment was echoed by several respondents;
- in future need a paper on costs (labour requirements, machinery and other items like plastic covers etc.) and factors affecting. Costs are main factors restricting silage use;
- conference material will be used in teaching at university and in preparing handouts for farmers.
- some papers are being translated into Spanish to share with field technicians;

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- all papers and posters have been circulated to colleagues and students;
- the idea of using posters was good as most were brief and very informative;
- a number of respondents noted that in addition to the formal papers, posters and discussion they had informal exchanges with other participants on various subjects.

Table showing Contributors, Subscribers and Respondents by Country (and FAO Region).

<b>FAO Regions</b>	<b>Contributors (Papers and Posters)</b>	<b>Subscribers</b>	<b>Questionnaire Respondents</b>
<b>Africa</b>	Kenya, Tunisia, Uganda and Zimbabwe	Benin, Ethiopia, Ghana, Kenya, Malawi, Mauritius, Niger, Nigeria, South Africa, Tunisia and Zambia	Kenya, Mauritius and Zambia
<b>Asia</b>	China, Japan, Malaysia, Pakistan, Philippines and Thailand	Cambodia, China, India, Indonesia, Japan, Malaysia, Nepal, Pakistan, Philippines, Thailand and Vietnam	India, Malaysia, Pakistan, Philippines, Thailand and Vietnam
<b>Europe</b>	Israel, Netherlands and UK	Austria, Belgium, Denmark, France (including La Reunion), Finland, Germany, Greece, Italy, Malta, Netherlands, Portugal, Spain, Sweden, Switzerland, UK and Yugoslavia	Austria, Belgium, Denmark, France (including La Reunion), Finland, Germany, Malta, Netherlands, Portugal, Spain and UK

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<b>FAO Regions</b>	<b>Contributors (Papers and Posters)</b>	<b>Subscribers</b>	<b>Questionnaire Respondents</b>
<b>Latin America and the Caribbean</b>	Brazil, Chile, Costa Rica, Cuba and Uruguay	Antigua, Argentina, Bolivia, Brazil, Chile, Colombia, Costa Rica, Cuba, Dominican Republic, Ecuador, El Salvador, Honduras, Jamaica, Mexico, Nicaragua, Panama, Peru, Puerto Rico, Uruguay and Venezuela	Argentina, Brazil, Colombia, Costa Rica, El Salvador, Ecuador, Honduras, Mexico, Peru and Venezuela
<b>Near East</b>		Afghanistan, Egypt, Kuwait, Lebanon and Saudi Arabia	
<b>North America</b>		Canada and USA	USA
<b>Southwest Pacific</b>	Australia and New Zealand	Australia, Fiji, New Zealand and Papua New Guinea	Australia and New Zealand