Improved Forage Strategies for High-yielding Dairy Cows in Vietnam - Report of a Workshop

July 2013
Abstract
This report presents results of the workshop “Improved forage strategies for high-yielding dairy cows in Vietnam” which was held with Vietnamese stakeholders on January 17-18, 2013 in Ho Chi Minh City as part of the project “Forage and Grass Production for Dairy Development in Vietnam” funded by the Netherlands Ministry of Economic Affairs.

Keywords
Dairy, Cattle, Forage, Grass, Feed, Vietnam

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Author(s)
Bram Wouters
Jan van der Lee
Nguyen Quang Thieu
Ngo Van Man
Nguyen Mai Vinh Quang

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Bram Wouters
Jan van der Lee
Nguyen Quang Thieu
Ngo Van Man
Nguyen Mai Vinh Quang

July 2013
Report of Workshop held at Ho Chi Minh City, Vietnam on January 17 and 18, 2013

Organized by:

Sponsored by:
Preface

The workshop “Improved forage strategies for high yielding dairy cattle in Vietnam” was conducted as part of the project “Sustainable Forage and Grass Production for dairy production in Vietnam”, a project funded by the Netherlands Ministry of Economic Affairs.

This workshop would not have been successful without active cooperation among many partners. We would like to highlight the valuable contributions of the following partners and thank them for their cooperation.

The Department of Livestock Development of the Ministry of Agriculture and Rural Development, under the leadership of Dr Hoang Kim Giao with active contributions by Dr Tong Xuan Chinh and Mrs Hoang Thi Thien Huong.

The Embassy of the Kingdom of the Netherlands for leadership, support and contributions in various ways, in particular Mrs Daphne Dernison, Agricultural Councillor and Mrs Truong Thi Dung, Agricultural Assistant.

A large team from the Faculty of Animal Science and Veterinary Medicine, University of Agriculture & Forestry in Ho Chi Minh City, under leadership of Dr Nguyen Quang Thieu who we are main co-organizers. Special thanks go also to Dr Ngo Van Man, Mr Nguyen Van Hiep and to Dr Vo Lam of An Giang University who provided input for the workshop design and organisation, presentations and who facilitated group work and to Dr Nguyen Quang Thieu for his leading role during the workshop.

FrieslandCampina Vietnam for their sponsorship and contributions. Special thanks go to Mr Luu Van Tan and Mrs Nguyen Thi Bich Hang because of their input for the workshop design, presentation, facilitation of group work and the excellent organization of the field excursion.

Fresh Studio staff, with Mr Alex van Andel and Mr Nguyen Mai Vinh Quang, was very helpful in helping to organize the workshop and in recording of discussions and reporting.

While already long, this list is by far not exhaustive. We would just like to thank all other participants and staff for making this workshop a valuable time of learning and exchange!

Bram Wouters
Jan van der Lee
Executive Summary

Dairy consumption in Vietnam is increasing, as it is in most South-East Asian countries. The goal of the Vietnamese government is to reach a level of self-sufficiency for dairy products of 38% in 2020\(^1\).

Sustainable dairy farming is based on the use of good quality forage and grassland in the feed ration. One of the major limitations to increase milk production per cow on dairy farms in Vietnam is the quantity and quality of feed, particularly the supply and quality of roughage/forage which leads to relative high use of purchased concentrate feeds per cow.

To support dairy development in Vietnam, the Netherlands Ministry of Economic Affairs funded in 2012 the project “Sustainable Forage and Grass Production for dairy production in Vietnam” which is implemented by Wageningen University and Research Centre in the Netherlands with support of local institutions and companies. This workshop, conducted on January 17 and 18, 2013 in Ho Chi Minh City was part of this project. The objectives for the workshop were as follows:

1. To exchange knowledge on improved forage options/strategies for improving quantity and quality of roughage supply for dairy cattle (special focus on options/innovations for improved forage production, use of silage (maize) and crop residues);
2. To set priorities and evaluate the most promising options and requirements from technical, economic and institutional point of view;
3. To develop actions and action plans for introduction and promotion of the most promising options.

The workshop program contained the following elements:

- The state of the art regarding the use of forages/roughage for dairy development in Vietnam:
  a. poster presentations and discussion on 1. the introduction and use of improved grass and forages, 2. the use of crop residues, 3. forage conservation and 4. institutional issues like land and capital requirements and 5. development, testing and introduction of new innovations;
  b. Oral presentations on Vietnamese policies on dairy development and forage development and improvement of forage strategies for high yielding dairy cows in Vietnam;
  c. Field excursion to pilot dairy farms of Dairy Development Program of FrieslandCampina Vietnam.

- Evaluation and preparation of plans for implementation of the most promising strategies for improvement of roughage production for dairy farms. This included: presentations (introduction of improved grasses in practice, sweet sorghum) and group work directed at identification of technical, institutional and policy measures required to successfully implement promising strategies.

The following conclusions and recommendations could be drawn from the poster and oral presentations, field visit and (group) discussions:

1. **Institutional aspects**
   o The limited availability of land for forage production is the main hindrance for improving the quantity and quality of roughage for dairy cattle. Options to improve the availability are development and implementation of government policies to allocate land to dairy farmers (for example in dairy zones), and development of business models for the production of forage by non-dairy farmers (for example growing maize for silage). Import of roughage from abroad is an option, but it is expensive and the sustainability on the long term is questionable.

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\(^1\) = Information of Ministry of Agriculture and Rural Development Vietnam
Innovation of input & service supply models for dairy production is seen as very crucial, also for improvement of the fodder situation. New models for input & service supply for dairy production need to be experimented with, especially those of dairy zones and business hubs.

Farmers' have limited knowledge on the importance of roughage and on roughage quality aspects in the cow’s ration. Farmers do not have a tradition of forage growing. More training, demonstration, extension and on-farm research is needed, also on how to up-scale promising innovations more successfully.

In the south of the country, the potential of small scale dairy farms to obtain high yields of good quality roughage has been shown, when improved technologies (good quality forage grasses) in combination with good management practices are applied. This is for example shown by the pilot farmers of the Dairy Development Program of FrieslandCampina Vietnam. However, up-scaling of these practices requires an effective extension strategy and service, training of farmers, and better understanding of farmers’ motives and possibilities.

The government extension service is not considered to be very effective when it comes to timely up scaling of promising options, organizing effective demonstrations and staff capacity. Experimentation with other methods of extension and knowledge transfer is needed. Extension and training organized by the private sector (dairy, feed companies, farmers’ organizations) could be a good alternative.

The optimal dairy farm size was discussed during the workshop. It was mentioned that the target should be to focus on medium scale dairy farms (50 cows, 80 heads). The sustainability of increasing local milk production by establishing large/mega farms was considered questionable.

The possibility of protecting the Vietnamese dairy sector by use of import quota for dairy ingredients was a matter of fierce debate during the workshop.

The need for more coordination in the dairy sector by means of setting up a dairy board/association was considered important by the participants.

2. Improvement of quantity and quality of forage/roughage

- Better use of locally available feed resources is an option to increase the quantity of roughage.
- Good quality roughage is important to meet the Vietnamese ambition to increase milk production and the cow’s productivity. To reach a target milk production of 15-20 litres of milk per cow per day, a ration with good quality roughage is needed. A basic ration based on roadside grass and crop residues will not be sufficient for these production levels.
- Improved forages like Mulatto II, maize (fresh or conserved), sweet sorghum varieties and winter crops like Avena spp and annual rye grass in the North could contribute considerably to improve the quantity and quality of the roughage ration. Further testing by means of on-farm research and demonstration is needed.
- Forage conservation is not much practised on small scale farms, but can be a solution for dry season and winter feeding. Forage conservation (silage) needs more attention according to the participants of the workshop. Maize (corn) silage can improve the amount of roughage available, and when well conserved, it will also improve the quality of the ration. For small scale farmers, ensiling in big plastic bags seems a feasible option (care should be taken of damage by rodents). For minimum losses, ensiling in plastic drums is better, but the initial investment is relatively high.
- Techniques like irrigation can considerably increase forage production in the South and, when growing winter crops, in the North as well.
**General conclusion:**

There are proven and promising technologies available to increase the roughage situation in Vietnam. The workshop clearly illustrated however that more than technology is required: conducive policies and support services (especially well functioning extension services), public as well as private, and new ways of public private cooperation are essential for successful improvement of the forage situation.
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1 Introduction

1.1 Background

Dairy consumption in Vietnam is increasing, as it is in most South-East Asian countries. Average milk consumption has grown from about 7 kg per capita per year in 2000 to 14 kg in 2011 (IFCN report 2012). Most of the dairy products available for consumers are made of imported dairy ingredients. About 25% of the total demand is produced in Vietnam itself. The goal of the Vietnamese government is to reach a level of self sufficiency of 38% in 2020.2

Fresh milk is produced mainly by smallholders (95% of all milk producers). Most of them are peri-urban dairy farmers with a herd size of 8-12 heads3. Large-scale farms (among others previous state farms) count for less than 5% of the milk suppliers. Average milk production per cow per year is estimated at 2380 kg4.

The highest amount of fresh milk (71%) is produced in the southern regions (mainly South-East, around Ho Chi Minh City). About 25% of the milk is produced in the northern regions (Red River Delta and Northern Midlands and Mountains). In the central regions only about 3% of the milk is produced5. Large industrial dairy farms with integrated milk processing are rare, but since recently a large scale farm (TH farm) aiming to keep 30,000 heads is being developed while VINA milk develops also a number of large scale dairy farms.

Sustainable dairy farming is based on the use of good quality forage and grassland in the feed ration. One of the major limitations to increase milk production per cow on dairy farms in Vietnam is the quantity and quality of feed, particularly the roughage component in the ration which leads to relative high use of purchased concentrate feeds per cow.

The promotion and adoption of better forage and grass management practices is needed to increase cow productivity and competitiveness of dairy farming in Vietnam. A higher milk production per cow will contribute to more sustainable and competitive dairy farming.

To support Vietnam with developing dairy supply chains based on local milk production, the Netherlands Ministry of Economic Affairs funded in 2012 the project “Sustainable Forage and Grass Production in Vietnam” which is implemented by Wageningen University and Research Centre in the Netherlands with support of local institutions and companies (among others FrieslandCampina Vietnam). This workshop was conducted as part of this project.

1.2 Workshop focus and objectives

In the process of development, promotion and adoption of improved forage strategies and practices the following questions are leading and provided the reasons to conduct this workshop:

- What are the best forage options for high yielding dairy cows and what is needed from technical (quantity and quality), economic (competitiveness: cost price, labour requirements) and institutional (resource, organizational and regulatory requirements, and capacity building) point of view to make them feasible and attractive for farmers?

- What feeding/forage production strategies/systems are suitable for different dairy farming systems: small scale peri-urban dairy farms, medium scale specialized family farms, mixed dairy/crop farms, and large scale dairy farms?

- What supporting actions from public and private actors are essential for successful implementation of promising options?

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2 = Information Ministry of Agriculture and Rural Development Vietnam
3 = Information Dairy Development Program, FrieslandCampina Vietnam
4 = Information Ministry of Agriculture and Rural Development Vietnam
5 = Information Ministry of Agriculture and Rural Development Vietnam
The objectives for the workshop were defined as:

A. To exchange knowledge on improved forage options/strategies for improving quantity and quality of roughage supply for dairy cattle, with special focus on options/innovations for improved forage production and use of silage (maize) and crop residues in different dairy farming systems;
B. To set priorities and evaluate the most promising options and requirements from technical, economic and institutional point of view;
C. To develop actions and action plans for introduction and promotion of the most promising options.

The focus in the workshop was on identifying best forage/ feeding strategies for small scale and medium scale dairy farms in Vietnam.

1.3 Workshop organization, program and participants

The workshop was held on January 17 and 18, 2013 at Liberty 4 Hotel in Ho Chi Minh City, with a field excursion to Cu XI area on the first day.

The workshop was organized by Wageningen University and Research Centre in the Netherlands in cooperation with the University of Agriculture and Forestry (Nong Lam) in Ho Chi Minh City. Other parties contributing to the organisation of the workshop were the Department of Livestock Production of the Ministry of Agriculture and Rural Development (MARD), the Agricultural Office of the Netherlands Embassy, FrieslandCampina Vietnam and Fresh Studio.

The program contained the following elements (see Appendix 5 for details):

- The state of the art regarding the use of forages/ roughage for dairy development in Vietnam which included:
  a. Poster presentations and discussion on 1. the introduction and use of improved grass and forages, 2. the use of crop residues, 3. forage conservation and 4. institutional issues like land and capital requirements and exchange of knowledge, 5. development, testing and introduction of new innovations;
  b. Oral presentations on the situation regarding policies on dairy development and forage development;
  c. Field excursion to pilot dairy farms of Dairy Development Program of FrieslandCampina Vietnam.
- Evaluations and preparation of plans (including technical, organization and institutional aspects) for implementation of the most promising strategies for improvement of roughage production for dairy farms which included: presentations (introduction of improved grasses in practice, sweet sorghum) and group work. The group work was directed at identification of technical, institutional and policy measures required to successfully implement promising strategies.
The workshop stimulated active use of the knowledge and experience of participants, by offering opportunities to share their input and opinions in discussion groups.

Participants represented a cross section of the stakeholders from public and private sector involved in dairy development:

- Government officials – MARD, Extension service, knowledge institutes: universities and research institutes
- Private sector: dairy farmers (from small to large scale), dairy processors, input suppliers (feed industry, seed, feed importers), consultants
- NGOs (cooperative)

See for particulars of participants Appendix 6.

1.4 Workshop report and evaluation

This report presents the results of the workshop describing the state of the art with the (poster) presentations, discussion and field visit on the first day in chapter 2. The presentations and reports on the group discussions on promising strategies are presented in chapter 3. Chapter 4 gives the conclusions and recommendations. The Appendixes provide more information on the presentations (power point presentations) and the farms which were visited during the field excursion, details of the discussions on the posters and the group discussions, program and particulars of the participants.

The evaluation of the workshop by the participants is summarized in Appendix 4.
2 Workshop Day 1- State of the Art

2.1 Opening and presentations

Welcome and Opening
After a welcome by Dr Nguyen Quang Thieu, Vice Dean of Faculty of Animal Science and Veterinary Medicine, Nong Lam University, Dr Tong Xuan Chinh, Department of Livestock Production, MARD, opened the workshop, followed by a speech of Mrs Daphne Dernison, Agricultural Councillor at the Embassy of the Kingdom of the Netherlands. In his opening speech Dr Tong Xuan Chinh stressed the importance of dairy and forage development for Vietnam. Mrs Daphne Dernison mentioned that this workshop was one of the first cooperation activities between the Ministry of Economic Affairs in the Netherlands and stakeholders in Vietnam in the area of dairy production.

Presentations on State of the Art:

Presentation “Current policies regarding dairy and forage development in Vietnam”, by Mrs Hoang Thi Thien Huong, Department of Livestock Production, MARD.

Mrs Huong mentioned that the goal of the government policy is to achieve a total milk production of 1012 tons by the year 2020 with about 500,000 dairy animals. The trends regarding dairy development include an increase of the number of dairy cattle (mainly by import) and an increase in the number of animals per farm. Currently milk is mainly produced on small scale dairy farms with only 384 farms keeping over 20 heads. Average farm size in the North is smaller than in the South (4.7 versus 7.3 heads/farm).

According to government statistics there was (particularly in the period 2004-2010) a large increase in the area planted with fodder (not only for dairy): from 4,680 ha to 200,000 ha at present. 40 tons of forage seeds were imported in the period 2005-2010.

Main problems related to forage production are the limited area of land available per farm, farmers not having a tradition of forage production, a lack of policies to change the structure in agricultural production, low adoption of improved technologies, and matching suitable forage species with the right agro-ecological zone.

Several policy instruments used for support of dairy farmers were explained. See for further information Appendix 1.

Presentation “Recent innovations in grass and forage production for dairy production in Vietnam”, by Mr Bram Wouters (Wageningen UR Livestock Research) and Dr Ngo Van Man (University of Agriculture & Forestry HCMC).

The presentation highlighted the following subjects: importance of roughage in the cow's ration, major limitations concerning roughage supply, and options for improvement. The importance of quantity and quality of roughage in the dairy cow’s diet was stressed and the relationships between the quality of roughage and milk production was shown. Major limitations for improvement of roughage supply and quality include: the low quality of the roughage fed, low use of improved forages/grasses, and sub-optimal management practices due to lack of knowledge among farmers. Quantity of roughage is low due to lack of land and seasonality of forage production. Options for improvement of roughage quantity and quality include better access of farmers to inputs (seed, fertilizer, finance) and services (extension, laboratory services etc.), technology development and testing (improved forages, irrigation, manure management), and improvement of farm management (extension, training etc.).

See for further information Appendix 1.
2.2 Group work Day 1: State of the Art

The state of the art was also summarized and presented in 5 posters. The titles of the 5 posters on display were:

- Poster 1 Improved grasses and forage to increase quantity and quality of roughage
- Poster 2 Forage conservation
- Poster 3 Crop Residues
- Poster 4 Land and Capital Requirements for forage production
- Poster 5 Development, testing & introduction of innovations- Improving Farmers’ management.

The group work of day 1 was directed to add and comment on these posters. The contributions and remarks of the participants on the five posters are included below.

In five rounds, five groups of participants discussed all five posters that were prepared for the workshop. This familiarized all participants with experiences on key themes of forage development for dairy production in Vietnam.
Improved grasses and forages to increase quantity and quality of roughage

Mr. Bram Wouters, Dr. Ngo Van Man, Mr. Jan van der Lee

Background

In Vietnam, dairy cows are kept mainly in confinement in cut and carry systems, with as main roughage sources: natural grass, king grass, crop residues, and, on large scale farms, corn silage.

King or elephant grass is the most commonly used grass among smallholders, due to high yield, easy way of propagation, drought tolerance, and persistency.

Disadvantages of king grass are the low quality at older age (more stems result in large feeding rests), high fertilizer requirements, and difficult to uproot.

Northern and mountainous parts of Vietnam experience dry, cold winters, when tropical grasses do not grow. The South has a dry season with no or slow growth.

Results and experiences with improved grasses

Several projects and research institutions tested improved grasses and legumes in practice (NIAH, IAS, CIAT, ILRI).

Results from several researches (Nguyen Ngoc Ha et al. 1995, Ngo Van Man et. Al, 2003 and others) show that grasses like Guinea grass (Panicum maximum) can compete well in terms of quality and yield with King grass. Table 1 shows a comparison of grasses, legumes, and forage crops in Vietnam, based on research results of NIAH, CIAT etc.

Table 1. Comparison of grasses, legumes and forage crops.

<table>
<thead>
<tr>
<th>Grasses</th>
<th>Yield</th>
<th>Quality (energy, Protein, leafiness)</th>
<th>Ease/costs of establishment (seed, vegetative)</th>
</tr>
</thead>
<tbody>
<tr>
<td>King grass</td>
<td>+++</td>
<td>+</td>
<td>+++</td>
</tr>
<tr>
<td>Pennisetum (including VA06)</td>
<td>+++</td>
<td>++</td>
<td>+</td>
</tr>
<tr>
<td>Guinea grass</td>
<td>+++</td>
<td>++</td>
<td>+</td>
</tr>
<tr>
<td>Mulato II</td>
<td>+++</td>
<td>++</td>
<td>+</td>
</tr>
<tr>
<td>Paspalum</td>
<td>++</td>
<td>+</td>
<td>+</td>
</tr>
<tr>
<td>Legumes</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Lolazooa</td>
<td>+</td>
<td>+++</td>
<td>+</td>
</tr>
<tr>
<td>Stylo</td>
<td>+</td>
<td>++</td>
<td>+</td>
</tr>
<tr>
<td>Forage crops</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Maize/com</td>
<td>++</td>
<td>+++</td>
<td>+</td>
</tr>
<tr>
<td>Oats</td>
<td>++</td>
<td>+++</td>
<td>+</td>
</tr>
<tr>
<td>Sorghum</td>
<td>+++</td>
<td>++</td>
<td>+</td>
</tr>
</tbody>
</table>

Note: +++ = good, ++ = moderate/okay, + = moderate/low

Major Issues

- How do promising grass species best fit in the local conditions/ farming system: more on-farm testing of promising options (e.g. Mulatto II, oats, promising legumes)
- How to up-scale successful options
- Supply of certified seed, planting material, as well as establishment (methods, costs)
- Management and utilization: fertilization, irrigation, cutting management
- Farmers knowledge on cultivation, management, and feeding practices
- Land to grow good quality forage crops.

Options for improvement

- Mulato II as grass for tropical conditions
- Oats/ryegrass for winter season (North of Vietnam)

Maize as forage crop, to be grown by crop farmers.

References


Salgado P. et al. (2010); Identifying suitable temperate grass species and cultural practices for herbage production in the mountain regions of North Vietnam. Grass and Forage Science, Vol 65, 110-120
Poster 1 - Improved grasses and forage to increase quantity and quality of roughage

Summary of comments of participants on the poster 1: “Improved grasses and forages to increase quantity and quality of roughage”:

Land use issue:
- government policies are needed to support land use for forage crops;
- the profitability of growing forage compared to other land use should be determined.

Farmers know how:
- farmers need knowledge on cutting management and quality.

Additional options for improved grasses/roughage:
- ‘do mai’ stylo, sorghum, sugarcane, sugar cane leaves, Guatemala grass for the North, vegetables like “cay cai dau”, “cay aHN dao” (cheery tree),
- forage variety for dry season in the North is needed;
- most suitable forage species is also determined by ecological conditions.

Quality check:
- laboratory is needed to determine quality of forages.

Other remarks:
- evaluation of forage crops (like shown in the poster) should be based on dry matter yields.

For detailed list of remarks on the poster 1 see Appendix 2.
Forage conservation

Background

Forage conservation in the form of making hay and/or silage is common in temperate areas to secure feed for the winter. In tropical countries forage conservation is less common.

Making good quality hay of tropical grasses is difficult because:
- grasses are coarse and stemmy
- in humid tropical climates, drying is slow and infestation by fungus is high.

Making good quality silage of tropical grasses is more difficult than of temperate grasses because of:
- low content of sugars (water soluble carbohydrates) for fermentation
- difficult conditions to pre-wilt
- need for chopping to compact
- higher ambient temperatures cause more secondary fermentation.

Addition of molasses is needed in most cases.

Silage making of whole crop maize is relatively easy and applied world wide.

Present practices

On large scale farms dairy farms in Vietnam, silage making of whole crop corn is practised. Silage making is mechanised and silage is stored in bunker silos. The resulting quality varies and depends on quality of the crop (dry matter content, proportion of cob), quality of chopping, compaction and sealing, and the speed of removing silage from the silo for feeding.

No special maize variety is being used for silage making.

Maize stover (without cob) is ensiled on some farms and can produce reasonable quality silage when good silage making practices are applied. The feeding value is much lower than that of whole crop maize silage.

Commercial companies in Vietnam buy green maize from farmers and make maize silage for export in big (jumbo) bags (maize sometimes also is ensiled in combination with sugar rich products like pineapple waste).

In the North of Vietnam, ensiling of whole crop maize in big bags has been successfully introduced on smallholder farms for feeding in the winter season.

Ensiling of green rice straw is done incidentally, but the already low quality of product at time of ensiling affects the end product.

Experiments have been conducted with ensiling of cassava chips and legumes like tropical kudzu.

Major Issues

- Suitable varieties for maize for silage
- Cultivation and management of maize
- Knowledge and experience of farmers with good forage conservation practices
- Silage making system to produce silage on large and medium scale farms, using outgrower schemes (contracts with crop farmers)
- Mechanisation (chopping) for good quality silage
- Silage systems for small scale farms.

Options for improvement

- Improvement of maize cultivation: testing of varieties, planting, and fertilization
- Development of maize silage production with outgrowers and feeding system for medium scale farms
- Optimizing silage making for smallholders (in the South of Vietnam)
- Exchange of experiences and knowledge (among others with Thailand).
Crop residues

Background
In mixed crop-livestock systems in tropical Southeast Asia, crop residues are an important feedstuff for dairy cattle: residues from grain crops (rice, sorghum, wheat, maize etc.) are used, as are stover from oil seed crops like soy bean and groundnut.

The quality of grain straw (i.e. digestibility and crude protein) varies according to species: rice straw has the lowest digestibility and maize stover the highest. Leaves of rice straw are less digestible than the stems.

Vietnam has large amounts of rice straw and maize stover available. Many dairy farmers use rice straw/maize stover as dry season feed, or as supplement to green grass or forage.

The intake of rice straw is low when fed as the only roughage. Expected milk production of unrestricted feeding of rice straw in combination with large amount of concentrates (8 kg) will reach maximum of 13 kgs of milk per cow per day.

To improve the digestibility, chemical treatment of straw is widely investigated and practised. The most applied system is urea treatment (mixing straw with a solution of urea (3-5% urea per kg dry product) and an airtight incubation of minimum of 10 days).

Urea treatment also increases nitrogen availability. Urea sometimes (partly) is substituted by lime because of costs and availability.

Results
Nguyen Xuan Trach (1998) made an overview of the utilization of rice straw. During the nineties of last century, several experiments were carried out in Vietnam with urea treatment of rice straw.

Experiments showed that treatment of rice straw with 3% urea and an incubation time of 10 days produced good results concerning improvement of digestibility, increase of nitrogen content was highest with 5% urea.

Experiments also showed significant effects on intake and milk production when feeding 4% urea treated rice straw, in comparison with feeding untreated rice straw. Experiments in Hanoi area showed a milk yield increase of about 15% when feeding 2% urea treated rice straw. (source: Nguyen Xuan Trach, 1998)

Recent results with urea and lime treatment (2.2%+2.2%) of rice straw in Thailand showed a response of about 13% in milk yield (Wanapat M, et.al., 2009). It seems that economic benefits are the largest with low producing animals.

Adoption of urea treatment of rice straw among small scale farmers was/is slow.

Nguyen Xuan Trach (1998) mentions that a system of improved rice straw utilization should be simple, machinery independent, using cheap and freely available inputs, and easy to fit in the farmer’s routine.

Major issues
- Incorporation of crop residues in the feeding system on dairy farms
- Availability of crop residues for dairy farmers (linkages with crop farmers)
- Improvement of methods of urea/lime treatment.

Options for improvement
- Inclusion of crop residues in rations for low or non-producing animals
- Baling and treatment of rice straw by commercial parties.

References

Summary of comments by participants on poster 2. “Forage conservation”

Types of silage and silage making:
- corn, rice straw and fresh grass and silage from corn stover (expected to increase in the future);
- costs of silage making should be evaluated.

Process of silage/ hay making:
- grass is difficult to dry (to wilt) in rainy season;
- crushing of corn seeds when making corn silage needs attention;
- use of molasses for better fermentation;
- making silage in a bag: compression is important;
- machinery is needed to make hay.

Farmers’ knowledge:
- farmers have insufficient knowledge on silage making.

Summary of comments of participants on poster 3 - “Crop Residues”

Other potential crop residues:
- Banana tree stem, groundnut straw, fruit waste (jackfruit, passion fruit skin, pineapple residue), market/vegetable waste (lettuce), sweet potato leaves, cassava (leave, tuber), groundnut stover, coffee and cocoa husks, cotton and rubber seeds, and corn stover and cobs without seed.

Urea treatment of rice straw:
- Technique to make rice straw silage is difficult, as is packaging.

Quality test:
- Laboratory is needed to test quality of crop residues.

For detailed list of remarks on the posters 2 and 3 see Appendix 2.
Land & capital requirements for growing forage

Background

A basic requirement of cattle is their need for roughage or fibrous material. For an optimal production, at least 40% roughage is needed in the ration of a dairy cow.

The intake of roughage by dairy cows is determined mainly by the quantity and the quality of the feed offered (digestibility, protein). If quality is high, intake of roughage will be high, and as a result more milk will be produced from roughage.

Feeding costs often amount to more than 60% of variable costs. The cost price of milk produced by cows fed with good quality roughage often is lower than when low quality roughage and high amounts of concentrate are fed.

Production of good quality forage requires good quality land, as well as capital for mechanization when it is produced on a large scale.

Roughage in dairy cattle feeding in Vietnam

Early experiments with crossbred cattle in Vietnam showed that cost price of milk from rations with high amounts of roughage (natural grass) was lower than from rations with high amounts of concentrates (Sanh et al., 2001).

Data from DDP Vietnam (2010) show that small scale farms with more access to land/roughage (farms in rural areas) had lower feeding costs than farms in urban areas.

Trade in roughage (grass, crop residues, forage crops like corn) supplies farms with little or no land. The government’s policy is to stimulate provincial governments to allocate land for forage production.

Another trend is the import of hay (alfalfa and grass hay) by large scale farms and dairy companies. Imports of hay from the US amounted to 3.9 million US dollars in 2010 (data USDA).

Major Issues

- Availability of good quality land for present dairy farmers to expand (herd size is increasing while farm size is not increasing)
- Effective government policies and instruments to increase production area for forage production
- Forage is grown on land that is less suitable for growing forage crops (rice fields)
- The sustainability of import of hay/roughage (economic, foreign currency requirements).

Options for improvement

- Allocation of land for dairy farming and development of dairy zones
- Contracting of crop farmers to grow forage for dairy farmers

References


Hung, T.B. (2010) Data from DDP farmers Vietnam

Tran Q. and VigiL, Alex M. (2011) GAIN Report, USDA
Development, testing, & introduction of innovations - Improving farmers management

Mr. Bram Wouters, Dr. Ngo Van Man, Mr. Jan van der Lee

Background

Production and utilization of good quality roughage requires that:
- Farmers and advisors have good knowledge of forage cultivation, management practices, technologies like irrigation, forage conservation and good feeding practices
- On large scale farms skilled and well trained farm staff is available to produce and utilize good quality roughage
- New innovations are being developed, tested and introduced on farms.

Present situation

Farmers obtain knowledge about forage production and feeding from government extension staff, advisors from companies (dairy companies, feed companies), and from knowledge institutes (research and universities). Neighbours and other farmers also are an important source for knowledge and information.

The following farm management practices need attention in relation to production of improved grasses and forage crops:
- Cultivation and management practices like choice of species, planting and fertilization
- Irrigation during dry season
- Utilization: cutting management, chopping, frequency of feeding etc.

The observation is that farmers cut at a too old stage, that fertilization is not well balanced, and that irrigation can increase yields significantly.

Development, testing, and introduction of new innovations and practices takes place through government institutions (universities, National Institute for Animal Science / Sa Vi Cattle and Forage Research Centre, Maize Research Institute, and National Extension Centre), private sector companies (new products, private extension service) and farmers.

Several projects monitored adoption of improved forage species, practices and/or technologies, when introducing new forage species and technologies by CIAT and other organizations. Important factors for farmers to adopt new forage species were (Stur W. et. al, 2010):
- Ease of planting, cutting, collection, transport
- High forage yield, fast regrowth after cutting, good growth, no competition with adjacent crops, and good survival after cutting
- Not itchy when cutting
- Animals like it, eat it quickly and get satisfied.

Lack of adoption of new technologies, especially among smallholder farmers, can be attributed to (Nguyen Xuan Trach......):
- Lack of knowledge among farmers
- Poor linkages between research, extension, and farmers
- Risk aversion of farmers
- Technology is not fit for farmers’ conditions: not profitable, too complicated, or not technically sound.

Major issues

- Farmers knowledge regarding management and utilization of forage crops
- Linkages between research-extension-farmers-private sector are weak in relation to:
  - introduction and testing of new innovations
  - network for exchange of experience and knowledge
  - formulation of extension messages
- Need for a set of proven and agreed recommendations for formulation of extension messages
- Need for effective extension services to advise and train farmers
- Insufficient capacity to develop and test new innovations.

Options for improvement

- Pilot projects of extension-research-farmers-private sector to test and demonstrate new innovations (grass species, forage conservation) in practice
- Up-scaling, dissemination of knowledge, training of farmers by public and private extension services
- Development of grass and forage network of experts/specialists/farmers from public and private sectors to exchange knowledge and experiences, and to formulate recommendations.

References

Stur W. et. al, 2010. A survey of adoption of forages

Summary of comments of participants on poster 4 – “Land & capital requirements for growing forage”

Increase of land use for forage:
- The ratio cows: land needs more attention
- Rent land to grow forage;
- Risk of contract farming for forage production is side selling;
- Use of rice fields to grow forage needs arrangements for drainage.

Seed availability:
- Seed availability and quality need to improve;
- Import of forage seed needs to be facilitated.

Farmer’s knowledge:
- Instruction materials needed to guide farmers how to grow forage.

Summary of comments of participants on poster 5 – “Development, testing and introduction of innovations to improve farm management”

Extension/training:
- Extension team needs to be well trained;
- Instruction by foreign expert is of different level (training of trainers);
- Training of farmers needed for better use of crop residues.

Innovation:
- Develop a team consisting of agronomists/extension staff together with farmers, government departments (extension) and knowledge institutions;
- Need for updated technology concerning forage conservation;
- Farmers need/want a business model in which government supports them with capital and technology according to their farm size;
- Government should make import of grass seed easier.

For detailed list of remarks on the posters 4 and 5 see Appendix 2.
2.3 Field excursion - Learning from practice

In the afternoon of the first day a field excursion was organized to two pilot farms of the Dairy Development Program of FrieslandCampina Vietnam. These farms were medium size commercial dairy farms located in the Cu Chi area. The dairy farmers applied new technologies to increase forage production and quality namely: use of Mulatto II hybrid grass, sprinkler irrigation, good forage management (cutting, fertilization) and silage making.

On the dairy farm of Mrs Thang Phu, 77 dairy animals (30 lactating cows) were kept on an area of 3.5 ha used for grass production. New innovations regarding forage / roughage supply included sprinkler irrigation, the use of the *Brachiaria hybrid* Mulato II established in 2010 and silage making of king grass mixed with pine apple waste in a trench silo built in 2012. During the visit this silage was fed to the animals. The major constraint was the lack of land to expand grass production, which is partly solved by the purchase of roughage (maize silage in plastic drums). The grass/forage and cow management made a good impression on the participants.

On the dairy farm of Mr Vo Van Thang, 60 dairy animals (21 lactating cows) were kept on a grassland area of 1.3 ha. On this farm Mulato II grass was introduced with good results. With sprinkler irrigation and good fertilization of the grass plot, yields of more than 400 tons of fresh Mulato II grass are harvested. The farmer is expanding his dairy farm and as land is a limiting factor, he had bought 0.5 ha of land.

More information on the farms can be found in Appendix 3.

Visit to pilot dairy farms (organized by FrieslandCampina Vietnam).
Some remarks concerning the field excursion made on Day 2

The management of the two farms was judged as very good by the workshop participants, especially the management of the Mulato II hybrid grass. There is still not much information on the quality of this grass and its persistence under good management.

Seed to establish the grass is expensive and the availability of seed is a problem. If large areas are sown at once, there is a lack of feed during the establishment period. Slowly expanding the area by means of vegetative propagation is practiced by farmers.

Maize silage may produce better quality feed than silage from overgrown King grass. Use of plastic bags for ensiling is being tested and silage making in plastic drums can make good quality silage, however the volume that can be ensiled is small and the initial investment is rather high.
3 Workshop Day 2: Promising strategies

3.1 Presentations on Promising strategies

Day 2 started with 2 presentations on introduction of new forage species.

A presentation on “Introduction of improved grass in practice – the experience of DDP Vietnam” was given by Mrs Nguyen Thi Bich Hang, FrieslandCampina Vietnam (see also Appendix 1).

Mrs Hang explained shortly the activities and extension program of the Dairy Development Program of FrieslandCampina Vietnam. A demo farm run by DDP staff and practical commercial farms (pilot farms) are used for introduction and testing of new technologies. The experiences with the introduction of Mulato II hybrid grass on demo and pilot farms were presented. Production on the demo and pilot farms in the Ho Chi Minh area was high: 300 tons fresh grass per ha per year in 9-10 cuts under good management and irrigation. Compared to King grass (or elephant grass), the forage grass most commonly grown by dairy farmers, the quality of Mulato II was better (higher protein content), the intake higher (more leafy), and feed residues when fed un-chopped were less.

The grass hybrid Mulato II offers good perspectives to improve forage quality and intake. The challenges for up-scaling are: to convince farmers to change from King grass to Mulato (investment (seed etc.), labour requirements (for re-establishment), seed availability, the lower grass production during the establishment phase and the need for irrigation (dry season production without irrigation is low).

Dr Om Danghi from Minh Dang company gave a presentation on “Introduction of sweet sorghum hybrids in Vietnam”.

Dr Danghi explained the success of the breeding of sweet sorghum hybrids and application in Canada. Sweet sorghum hybrids have a number of advantages compared to maize, as they are more drought tolerant (lower water use) and have a higher protein content. These characteristics make sweet sorghum popular for silage making in Canada. Sweet sorghum varieties do not contain prussic acid like most Sorghum species do. Recently the company has introduced sweet sorghum varieties and the company is planning to produce seed locally. When testing the sorghum varieties, it became clear that soil fertility was poor. Soil fertility is an important issue to be addressed when growing improved forages.

3.2 Group work Day 2 – Group Discussion on promising strategies

A summary of the outcomes of the group work of the first morning and selection of promising strategies for further development for large scale and small scale farms served as a starting point for further group work. See the following table.
<table>
<thead>
<tr>
<th>Group 1</th>
<th>Group 2</th>
<th>Group 3</th>
</tr>
</thead>
<tbody>
<tr>
<td>Conducive policies &amp; strategies <em>(issues to be addressed by authorities)</em></td>
<td>Technical options <em>(the most promising innovations for improved forage supply and forage quality)</em></td>
<td>Extension, education &amp; research for improved farm management <em>(new forms of implementation and cooperation in the areas of farm advice, forage production <em>(like contract farming)</em>, knowledge exchange &amp; innovation development)</em></td>
</tr>
<tr>
<td>1. Allocation of land, capital and services</td>
<td>1. Identify suitability and management recommendations of grasses and forages as dairy cattle feed for North and South</td>
<td>1. Pilot projects of extension-research-farmers-private sector to test and demonstrate new innovations <em>(grass species, forage conservation)</em> in practice</td>
</tr>
<tr>
<td>2. Development of dairy zone</td>
<td>2. Develop silage making model for smallholders <em>(North / South)</em></td>
<td>2. Demonstration and training of farmers by public and private extension services</td>
</tr>
<tr>
<td>3. Improve access to capital</td>
<td>3. Inclusion of crop residues in rations for low or non-producing animals</td>
<td>3. Improve dissemination and exchange of knowledge between stakeholders</td>
</tr>
<tr>
<td>4. Improve seed availability and seed quality</td>
<td></td>
<td>4. Establish organization with laboratory to check the nutritive value of grass, crop residues, and make recommendations to farmers</td>
</tr>
<tr>
<td>5. Develop new business models for dairy farming</td>
<td></td>
<td>5. Develop contracting model for crop farmers to grow forage for dairy farmers</td>
</tr>
</tbody>
</table>

The issues/strategies discussed by Group 1 were related to issues mentioned in Poster 4 *(Land and Capital requirements)* but also policy issues mentioned during the discussions of the other posters.

The technical options addressed by Group 2 were very much related to the Posters 1, 2 and 3 *(Improved grasses and forages, Forage Conservation and Crop Residues)*

The discussion issues in group 3 *(Extension, education and research)* had as starting point the poster 5 *(Development, testing and introduction of innovations)*.

The assignments/discussion questions for Day 2 group sessions were the following:

1. Review selected strategies that support improved availability and quality of forage. How feasible are they in terms of expected adoption, expected impact, cost/benefit and requirements in terms of labour, land, capital.
2. Draft an action plan for implementation of most promising strategies, including role of stakeholders:
   - What should be done?
   - How should it be done?
   - Who should be involved? *(and do you expect commitment?)*
   - Who will take the lead?
   - What is needed to start?
   - When could it start?
Results from the group discussions:

In most groups the time appeared too short to finish the complete assignment by developing detailed action plans as discussion on the strategies took more time in some groups.

Group 1. Conducive policies & strategies:

The discussion in the group focused first on the following issue/question:

*We need to define first what we want in the future: what is our target group – what size of dairy farm do we focus on?*

Impressions from the discussions:

- Focus on smallholder farms, but what is a suitable size and how to get there?
- Large scale farms will also continue to develop;
- Government thinks about allocating clusters of land for groups of dairy farmers (dairy zones); for development of large scale farms. The implementation is delegated to the provinces;
- Opportunities for dairy farmers in current lowland farming systems are very limited (availability of land and competition with other crops);
- What is sustainability of dairy farming?
  - Profit/income & continuity (handover to next generation), people-community, planet-environmental impact;
  - Larger size is not easy to make profitable due to high cost; smaller farms find it hard to improve quality of milk;
  - Target size for next 10 years should be farm with 50 milking cows (herds of 80), with milk yield increasing from 12-15 litres to 20-25 litres/day; need to prove profitability of these farms – how much land do they need?
  - Rule of thumb used now is 10 cows/hectare – this may be acceptable when productivity is low but this may not be the case with higher milk productions; other rule: 0.3 ha/cow for non-irrigated land/crops (like maize);
  - How intensive should land use be? Crop rotation should be taken into account.
- What is the role of the government?
  - They should have temporary measures, no long-term involvement in contracting. Role of enabler!
  - Policies can encourage rice farmers to turn to forage production – policies, subsidies, guarantees;
  - Land issue is key – policy should be comprehensive, covering land, seed, disease control, etc.
- Different models for service provision can be distinguished:
  - Nucleus farm
  - Business hub
  - Cooperative
  - Producer company
- For urban farmers there are few opportunities to cooperate with crop farmers;
- Take future of farm into account, and willingness to move to another area;
- What approach should we take? Advocate the land issue, develop a comprehensive master plan, or do both?

As key issues to be addressed, group 1 selected:

- Poor access to land
- Low profitability of dairy farming
Group 2: Technical issues for improving quality and quantity of forage

Three solutions were selected for further discussion:

1. **Improvement of pasture/ grass/forage production**
   - Options for small scale farm:
     - Should grow King grass because of the high yield while silage can be made to conserve surplus grass?
     - Mulato hybrid grass and other grasses for fresh feeding
   - Options for medium and large farm:
     - should grow maize for silage and Mulato hybrid grass or other forage to provide fresh forage feeding;
     - Timely harvesting, after 30-35 days, is better for regeneration of the crop and for forage quality;
     - Seed supply is not sufficient for farmers, especially Mulato hybrid grass seed
   - Control the quality of forage seed;

2. **Forage conservation**
   - Small scale farmers can use plastic/nylon bag or preferably plastic drum for silage making;
   - Remarks regarding King grass silage:
     - Should focus on how to press the silage to remove air
     - Control the cutting stage King grass for silage
     - Need to dry for 1 day before making silage,
     - Add molasses to improve the taste and fermentation;

3. **Crop residues**
   - Farmer can select crop residues depending on the availability of by-products in each region;
   - Options include rice straw, groundnuts and sweet potatoes (leaves).

Group 3: Extension, Education & Research for improved farm management

Points of departure:

- The introduction of advanced technologies from developed countries or from local institutions for forage production is slow, so that once the government approves and the farmers start to apply, the technologies are already outdated.
- Most dairy farmers do not have enough land to grow forage for their cows.
- The communication (information and advice given) or training from National Agriculture Extension to dairy farmers is still limited.

See for other issues the action plan.
3.3 Concluding plenary session

3.3.1 Presentations and discussion of action plans

Each group presented the outcome of the group discussions. At the end of the plenary presentation, all participants were asked to prioritize the actions by giving them a positive or negative mark. This resulted in a score which is included in the action plans of each group presented below.

**Action Plan Group 1. Conducive policies & strategy**

<table>
<thead>
<tr>
<th>Steps</th>
<th>Score</th>
<th>Responsibility</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Action: Contribute to discussion about land allocation for dairy</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1. Build up a policy for sustainable development of dairy farming. Make recommendations about sustainable dairy farm (size, services etc.);</td>
<td>+1</td>
<td>VCCI Sector org?</td>
</tr>
<tr>
<td>2. Need an official &amp; long-term master plan from government about the allocation of land, dairy areas to support the dairy sector in Vietnam;</td>
<td>+4</td>
<td>MARD, MPI</td>
</tr>
<tr>
<td>3. Support provincial governments in supporting the dairy sector</td>
<td>+4, -1</td>
<td>MARD</td>
</tr>
<tr>
<td>4. Develop specific plans for key issues, i.e. 1) land; 2) forage production; 3) collection &amp; processing; 4) technical services</td>
<td>+7, -2</td>
<td>MARD</td>
</tr>
<tr>
<td>5. Set up a sector organization for dairy farming (Dairy Board or Dairy Association) to represent the sector (dairy farmers, companies, policy makers) to support farmers and all involved parties</td>
<td>+8, -2</td>
<td></td>
</tr>
</tbody>
</table>

**Action: Develop an import quota system**

1. Develop regulations for import of dairy ingredients/ products based on demand and self-sufficiency target | +3, -7 | MTI, MARD |

**Action: Develop new models for dairy farming, like:**

- Dairy zones
- Nucleus farms
- Business hubs with Feed Centre, AI & farm advise services, collection & chilling;
- Cooperatives
- Private large-scale dairy farms

1. Policy development, e.g. on land exchange, environmental impact regulations, farm model development | +3 | MNRE |
2. Create pilots for different models | +2 | Public-private cooperation |
3. Improve seed importation regulations | +4 | |

Comments & discussion after presentation:

In one group there was a discussion on setting up an import quota system of milk powder for protection of Vietnamese dairy farmers, as the farm gate milk price was sometimes lower than the cost price. One participant argued that “A quota system is not good for the future. Some other countries removed the quota for importation of milk powder. Instead of setting up a quota, we should focus on how to support and improve dairy farmers. If the farmer will manage his farm well (growing forage + feeding his dairy cows), he can make enough profit and he will continue dairy farming; more farmers will be attracted to start”. Another participant strongly disagreed with this opinion. He argued that “Currently, the dairy sector in Vietnam is still young, just developing; the farmers need the support from the government, such as quota, to limit the import of milk powder. Once the dairy sector in Vietnam is well developed, we can consider the removal of the quota”. See for the opinions of the participants also the score of the action: “Develop Import Quota System” in table above.
**Action Plan Group 2. Technical issues for improving quality and quantity of forage**

The group discussion on the strategies as listed in paragraph 3.2 were presented. No detailed action plans were developed by the group.

**Comments & discussion after presentation:**

Sharing experiences about forage silage:

- Dry matter content of material to be ensiled should meet 30 – 35%;
- Good compaction is very important: have a good press to remove air;
- TH milk company is using large amounts of rice straw to make silage (following the urea treatment method recommended by Dr Trach) to supply their cows. How to arrange for better and more use of crop residues? Processing is not difficult, what matters is how you organize the process of forage production, collection, conservation and feeding;
- Getting land will take time; in the meantime let's make the best out of what we have.
### Action Plan Group 3. Extension, Education & Research for improved farm management

<table>
<thead>
<tr>
<th>Action</th>
<th>Score</th>
<th>Steps</th>
<th>Score</th>
<th>Responsibilities</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Issue: Agricultural extension activities</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>- Improve the process for approval of advanced technologies (testing, evaluation, and certification).</td>
<td>+2</td>
<td>1. Recheck and improve the procedures based on the experiences from previous years.</td>
<td>+1</td>
<td>MARD</td>
</tr>
<tr>
<td>- Shorten the transfer time to apply technologies in practice as soon as possible.</td>
<td>+2</td>
<td>2. Invite and encourage some other parties (private sector companies) to join the extension system.</td>
<td>-1</td>
<td>Multiple stakeholders, like private companies, foreign companies</td>
</tr>
<tr>
<td>- Regularly update and get more technology from overseas to Vietnam.</td>
<td>+3</td>
<td>3. Government or related department should issue some regulations or documents to guide all parties in the value chain to ensure the effectiveness of chain.</td>
<td>+1</td>
<td></td>
</tr>
<tr>
<td>- Improve the effectiveness of the public extension system – from central down to local – there are 35,000 staff in extension system.</td>
<td></td>
<td>4. National Extension Team should organize more training courses for dairy farmers; create more demo farms and evidence to persuade farmers to follow.</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Issue: Specialize into forage production for dairy farming</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>- Determine the demand and think about forage as a product.</td>
<td>+4</td>
<td>- Survey &amp; interview</td>
<td>-1</td>
<td>MARD</td>
</tr>
<tr>
<td>- Illustrate the advantages of fodder compared to other crops and show to farmers and other parties to encourage the production.</td>
<td>+6</td>
<td>- Model pilots</td>
<td>+2</td>
<td>Universities</td>
</tr>
<tr>
<td>- Develop groups or cooperatives of crop &amp; forage farmers that specialize in growing forage for dairy cows.</td>
<td>+5</td>
<td>- Training</td>
<td>+1</td>
<td>Research organizations</td>
</tr>
<tr>
<td>- Develop demonstration farm</td>
<td></td>
<td>- Develop demonstration farm</td>
<td></td>
<td>Agricultural companies</td>
</tr>
<tr>
<td></td>
<td></td>
<td>- Feedback to MARD</td>
<td></td>
<td>Private sector</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Comments & discussion after presentation:**

- Forage farming can be improved for developing dairy farming in Vietnam. But it needs the support from government and other departments in the beginning (training on best practices for growing forage, updating & transferring advanced technologies from international, testing the quality of grass, recommending farmers to buy seed, etc.).
Dairy farmers need to be updated about the nutritional facts of each kind of grass or forage. The government can support forage farmers by providing testing equipment to test the quality of forages in each region.

The extension system is very bureaucratic and inefficient system – could there be alternatives? Turn it private?

3.3.2 Conclusions and follow up agreements

Following the presentation of the action plans, as final exercise participants expressed their opinions about the proposed plans by selecting up to three actions that they agreed to most, up to three actions that they did not favour.

Although the results of this exercise are rather indicative, they do give an idea about what issues are seen as important, what solutions are seen as useful, and also what directions are not favoured. Hence we present the results of this exercise for the actions that were prioritized by the groups, as a rough indicator:

<table>
<thead>
<tr>
<th>Main actions defined in action plans</th>
<th>Votes in favour</th>
<th>Votes in disfavour</th>
</tr>
</thead>
<tbody>
<tr>
<td>Contribute to discussion about land allocation for dairy farming</td>
<td>+24</td>
<td>-5</td>
</tr>
<tr>
<td>Develop new models for input &amp; service supply for dairy production</td>
<td>+24</td>
<td>-3</td>
</tr>
<tr>
<td>Specialize into forage production for dairy farming</td>
<td>+19</td>
<td>-3</td>
</tr>
<tr>
<td>Agricultural extension</td>
<td>+10</td>
<td>-1</td>
</tr>
<tr>
<td>Use of forage conservation</td>
<td>+8</td>
<td>-3</td>
</tr>
<tr>
<td>Improved pasture</td>
<td>+6</td>
<td>-6</td>
</tr>
<tr>
<td>Use of Crop residues</td>
<td>+4</td>
<td>-2</td>
</tr>
<tr>
<td>Develop import quota system</td>
<td>+3</td>
<td>-7</td>
</tr>
</tbody>
</table>
3.3.3 Planned individual actions by participants (based on evaluation)

Intensions for individual follow up activities by participants as a result of this workshop (mentioned during the evaluation):

- Plan some activities to assist farmers to improve forage production;
- Consider importation of grass seed to sell in Vietnam;
- Improve the soil quality of my land to improve the productivity of forage;
- Study more about the technology of forage production;
- Start to grow sorghum;
- I will report to my director to set up the new policies for dairy sector and forage production;
- I will write a plan for developing the forage for dairy cows;
- Improve the skill of making silage for my farm;
- Start to grow maize and make maize silage.
4 Conclusions and recommendations of the workshop

The following conclusions and recommendations could be drawn from the poster and oral presentations, field visit and (group) discussions:

1. Institutional aspects
   - The limited availability of land for forage production is the main hindrance for improving the quantity and quality of roughage for dairy cattle. Options to improve the availability are development and implementation of government policies to allocate land to dairy farmers (for example in dairy zones) and development of business models for the production of forage by non-dairy farmers (for example maize for silage). Import of roughage from abroad is an option, but it is expensive and the sustainability on the long term is questionable.
   - Innovation of input & service supply models for dairy production is seen as very crucial, also for improvement of the fodder situation. New models for input & service supply for dairy production need to be experimented with, especially those of dairy zones and business hubs.
   - Farmers’ have limited knowledge on the importance of roughage and on roughage quality aspects in the cow’s ration. Farmers do not have a tradition of forage growing. More training, demonstration, extension and on-farm research is needed, also on how to up-scale promising innovations more successfully.
   - In the South, the potential of small scale dairy farms to obtain high yields of good quality roughage has been shown, when improved technologies (good quality forage grasses) in combination with good management practices are applied. This is for example shown by the pilot farmers of the Dairy Development Program of FrieslandCampina Vietnam. However, up-scaling of these practices requires an effective extension strategy and service, training of farmers and better understanding of farmers’ motives and possibilities.
   - The government extension service is not considered to be very effective when it comes to timely up scaling of promising options, organizing effective demonstrations and staff capacity. Experimentation with other methods of extension and knowledge transfer is needed. Extension and training organized by the private sector (dairy, feed companies, farmers’ organizations) could be a good alternative.
   - The size of the optimal dairy farm was discussed. It was mentioned during the discussions that the target should be to focus on medium scale dairy farms (50 cows, 80 heads). The sustainability of increasing local milk production by establishing large/mega farms was considered questionable.
   - The possibility of protecting the Vietnamese dairy sector by use of import quota for dairy ingredients was a matter of fierce debate during the workshop.
   - The need for more coordination in the dairy sector by means of setting up a dairy board/association was considered important by the participants.
2. **Improvement of quantity and quality of forage/roughage**

- Better use of locally available feed resources is needed to increase the quantity of roughage.
- Good quality roughage is important to meet the Vietnamese ambition to increase milk production and the cow's productivity. To reach a target milk production of 20 litres of milk per cow per day, a basic ration with good quality roughage is needed. A basic ration based on road side grass and crop residues will not be sufficient for these production levels.
- Improved forages like Mulatto II hybrid grass, maize/corn (fresh or conserved), sweet sorghum varieties and winter crops like *Avena spp* and annual rye grass in the North could contribute considerably to improve the quantity and quality of the roughage ration. Further testing by means of on-farm research and demonstration is needed.
- Forage conservation is not much practised on small scale farms, but can be a solution for dry season and winter feeding. More attention for forage conservation (silage) was considered important by the participants. Maize (corn) silage can improve the amount of roughage available, and when well-conserved it will also improve the quality of the ration. For small scale farmers, ensiling in plastic bags seems a feasible option (care should be taken of damage by rodents). For minimum losses, ensiling in plastic drums is better, but the initial investment is relatively high.
- Techniques like irrigation can considerably increase forage production in the South and, when growing winter crops, in the North as well.

3. **General conclusion:**

There are proven and promising technologies available to increase the roughage situation in Vietnam. The workshop clearly illustrated however that more than technology is required: conducive policies and support services (especially well functioning extension services), public as well as private and new ways of public private cooperation are essential for successful improvement of the forage situation.
Appendices

1. Presentations
2. Comments of participants on posters
3. Data on field visit
4. Workshop evaluation by participants
5. Program of workshop
6. Particulars of workshop participants
Appendix 1 - Presentations

1. Current policies regarding dairy and forage development in Vietnam
   Presentation by Mrs Hoang Thi Thien Huong, Dep. of Livestock Production, MARD

2. Recent innovations in grass and forage production for dairy production
   Presentation by Mr Bram Wouters (Wageningen UR Livestock Research) and Dr Ngo Van Man (University of Agriculture & Forestry HCMC)

3. Introduction of improved grass in practice – the experience of DDP Vietnam
   Presentation by Mrs Nguyen Thi Bich Hang, FrieslandCampina Vietnam

4. Group Assignments, Presentation by Jan van der Lee, Wageningen UR Livestock Research
Appendix 1.1

Improving forage strategies for high yielding dairy cows in Vietnam

Workshop Ho Chi Minh City
January 2013, Bram Wouters and Ngo Van Man

Content of presentation

1. Importance of roughage in dairy cattle’s ration
2. Major limitations in roughage supply and quality
3. Options for improvement of roughage supply
4. Discussion statements and conclusions

Importance of roughage in the cow’s ration

- For a good functioning of the rumen and good animal health cows need at least 35-40% roughage (fibrous feedstuffs) in their ration;
- Intake and quality of roughage determines total feed intake and as a result the total potential milk production;
- Roughage is in general a cheaper feed stuff than concentrate feeds or by-products (low quality fibrous feedstuffs).
Appendix 1.1

Relation between quality of roughage and intake

- Feed intake as % of body weight of cow
  - Low quality roughage: 1.0 - 1.5%
  - Medium quality roughage: 1.5 - 2.0%
  - High quality roughage: 2.0 - 2.5%
- Example: cow 500 kg body weight
  - Max Intake(DM/day)
    - Low quality roughage: 5 - 7.5 kg
    - Medium quality roughage: 7.5 - 10.0 kg
    - High quality roughage: 10.0 - 12.5 kg

Effect of quality of roughage on feed consumption and milk production
(cow 500 kg fed with roughage and concentrate feeds)

<table>
<thead>
<tr>
<th>Ration</th>
<th>Poor quality (rice straw)</th>
<th>Low quality (old grass)</th>
<th>Medium Quality (young grass)</th>
<th>Good Quality (corn silage)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Kg concentrate per cow per day</td>
<td>8</td>
<td>8</td>
<td>8</td>
<td>8</td>
</tr>
<tr>
<td>Intake kg dry matter/day</td>
<td>11.9</td>
<td>13.3</td>
<td>13.8</td>
<td>14.3</td>
</tr>
<tr>
<td>Roughage in ration (%)</td>
<td>39%</td>
<td>45%</td>
<td>48%</td>
<td>47%</td>
</tr>
<tr>
<td>Potential max. milk production Kg/cow/day</td>
<td>13.0</td>
<td>15.5</td>
<td>17.5</td>
<td>19.5</td>
</tr>
</tbody>
</table>

Characteristics Dairy Farming in Vietnam

- Government policy: 38% self-sufficiency in milk by 2020;
- 95% small holders (less than 10 dairy cows)
- Most of small holder dairy farms in south of Vietnam around HCMC and in north around Hanoi;
Appendix 1.1

Characteristics Dairy Farming in Vietnam

- Small holders:
  - Have very limited land for growing forage (survey in south: about 4000 m² per farm for growing forage);
  - Most cows kept in confinement (cut and carry systems)
- Growing number of large scale/ mega farms with more than 1000 cows per farm

Content of presentation

1. Importance of roughage in dairy cattle’s ration
2. Major limitations in roughage supply and quality
3. Options for improvement of roughage supply
4. Discussion statements and conclusions

Major limitations related to roughage supply and feeding on small-scale farms

- **Quantity** of roughage is too low:
  - Lack of land for pasture and/or growing forage crops; land is also used for export of forage
  - Use of local feed resources not optimal

Major limitations related to roughage supply and feeding on small-scale farms

- **Quantity** of roughage is too low:
  - Dry/winter season and lack of suitable technologies (high yielding forage crops, irrigation, forage conservation, winter crops)
  - Lack of knowledge (farmers, farm advisors) and farmers management practices (forage production, feeding)
Appendix 1.1

Major limitations related to roughage supply and feeding on small-scale farms

- **Quality of roughage is too low:**
  - Low use of improved forage grasses
  - Lack of knowledge (farmers, advisors)
  - Seed supply, costs and propagation
  - Yields lower than king grass etc.
  - Do not fit in farming/cropping system

Major limitations related to roughage supply and feeding on large-scale farms

- **Quantity of roughage**
  - Not enough land
  - Management of forage crops

- **Quality of roughage:**
  - Quality of silage making (corn)
  - Quality of mechanisation to make good silage
  - Lack of skilled labour

Major limitations related to roughage supply and feeding on small-scale farms

- **Quality of roughage is too low:**
  - Management practices:
    - Cutting of forage crops at too old stage
    - Feeding: compensating poor forage quality with concentrate feed;

Conclusion:

- **Low availability and poor quality** of locally produced roughage result in:
  - **Farm level**
    - Relative low milk production and milk quality;
    - Feed related health and cow fertility problems;
    - High cost price because of high use of concentrate feeds;
  - **Sector level**
    - Low sustainability of dairy farming system
    - No development (expansion) of small scale farms
  - **National level**
    - Local milk production not competitive with world market
    - More foreign exchange spent on imports of feeds and dairy products
Appendix 1.1

Content of presentation

1. Importance of roughage in dairy cattle’s ration
2. Major limitations in roughage supply and quality
3. Options for improvement of roughage supply
4. Discussion statements and conclusions

Options to improve availability and quality of roughage on dairy farms

- Better access and utilization of inputs (land, finance, seed) and services (among others extension) for forage production
- Development and introduction of technologies to improve the quantity and quality of roughage
- Improvement of farm management by increasing knowledge farmers through extension, training etc.

Options to increase access to inputs and services: land

- Land use policies: allocation of good land in special zones for forage production to stimulate dairy farming
  - Development of dairy zones
  - Large scale farm development
  - Assisting small scale farmer to expand?

- Outsourcing forage production:
  - To other local farmers
    - Contract farming for forage production
  - To foreign farmers:
    - Import of alfalfa and/or grass hay

Options to increase access to inputs and services

- Finance:
  - More credit facilities for inputs and investment

- Farm inputs
  - Seed supply and/or planting material
  - Import and local production
  - Supply of fertilizer (type), equipment and machinery for harvesting, silage making

- Contractor services for silage making

- Laboratory services for soil, feed analyses

- Extension services (public and private systems)
Technologies to improve roughage supply and quality

- Introduction of improved grasses/forage crops:
  - Tropical grasses/forages:
    - Guinea grass (Panicum), Mulato II (Brachiaria), Para grass (Brachiaria), Paspalum
    - Improved varieties of elephant/king grass (Pennisetum): VAD6, Taiwan???
    - Hybrid Sorghum (Jumbo)
  - Tropical legumes:
    - Leucaena, Stylo
  - Forage crops:
    - Maize for whole crop silage, oats in winter season

Technologies to improve roughage supply and quality

- Forage conservation
  - Ensiling of whole crop maize
    - Small scale: mini and jumbo bags/ small silos
    - Large scale: bunker silos
    - Option: addition of urea to chopped maize
  - Ensiling of other crops: grass/crop residues

- Improved utilization of crop residues
  - Urea(+lime) treatment of rice straw
    - Improvement of feeding value
  - Ensiling
    - Maize stover
    - Cassava chips and leaves
Appendix 1.1

Improvement of farmers’ knowledge and management

- Development, introduction and testing of new innovations/technologies by research, extension, private sector companies in cooperation with farmers (pilots, on-farm research)
- Training of farm advisors and farmers on:
  - Better grass and forage management practices (choice of species, fertilization, cultivation, irrigation, cutting etc.)
  - Better feeding practices (quantity and quality, supplementation, feeding frequency.
- Development of knowledge base and extension programs (government, private sector)

Content of presentation

1. Importance of roughage in dairy cattle’s ration
2. Major limitations in roughage supply and quality
3. Options for improvement of roughage supply
4. Discussion statements and conclusions

Concluding remarks

- To reach a higher level of milk production and to remain competitive, the quantity and quality of roughage for dairy cattle needs to improve considerably;
- Improvements need to be made by:
  - Making more land available for forage production
  - Innovations and technology development
  - Improving knowledge of farmers and advisors and farmers management by training, extension, development of extension messages, pilots and demonstrations
  - An integrated approach with cooperation of different public and private stakeholders is needed to realise these improvements

Promising options for improvement of roughage supply on dairy farms

- Increase inputs and services/policies
  - Land:
    - Development of dairy zones
    - Outsourcing of forage production to other farmers
  - Other inputs and services
    - Seed supply: import/local production
    - Private extension services
- Technologies:
  - Ensiling of whole crop corn/maize
  - Grass: Mulato II, temperate crops for winter season
Some statements for discussion

- Government policies should include allocation of areas of good quality land for small and medium size farms;
- Outsourcing of forage production like growing of maize to small scale farmers is a better option than importation of hay;
- Intensification of forage production (better and more fertilization, irrigation, cutting at young stage etc.) should be stimulated by means of farmers training, extension and better input supply;
- Promising technologies should be developed, introduced tested and up-scaled by combined efforts of research, private sector companies, extension and farmers;
- Import of forage seeds and local seed production should be stimulated and better organized

Requirements for adoption of technologies

**Small scale farmers**
- Simple, cheap (low investment), easy (labour requirement) to apply and not too risky (risk of failure);
- Should be tested under local conditions with farmers involvement and show clear benefits
- Should fit in the farming system: not competitive with other activities
- Inputs required (seed, fertilizer etc.) should be available and not too expensive;
- Farmer should have knowledge on right application of technology (urea treatment, forage conservation);

**Medium and large scale farms**
- Economic: clear benefits in terms of milk production and in relation to costs and investments;
- Should fit in overall feeding strategy developed for the farm;
- Should give stable results in terms of yield, quality and/or effects;
- Not complicated to apply and/or manage;
- Easy to apply in combination with mechanisation; not labour intensive

Some statements for discussion

- Adoption of technologies requires well proven technologies, knowledge of farmers conditions & wishes etc. and a good enabling environment (inputs, services);
- Promising technologies should be developed, tested and up-scaled by combined efforts of research, private companies, extension and farmers;
Thank you for your attention
PART I: OVERVIEW OF DAIRY SECTOR AND FORAGE PRODUCTION IN Vietnam

SITUATION AND STRATEGY OF DAIRY SECTOR
1. Population and growth
2. Distribution
3. Farm size
4. Raw milk production and milk consumption
5. Strategy

I. SITUATION AND STRATEGY OF DAIRY SECTOR

1. Dairy population and growth
   - Dairy sector is 50 years of history but it has really developed since 2001.
   - 1.10.2012: dairy population of Vietnam is approximate 167 thousands head, increases 17% comparing with 2011.
   - Average growth of dairy cattle in 2001-2010 is 13.47%/year.
2. Dairy distribution in ecological areas

- Dairy production has developed in agro-ecological areas
- Main distribution focus on South East 89.73 thousands head, about over 53% total, in which dairy cattle of Ho Chi Minh city is biggest about 50% in total.
2. Dairy distribution in ecological areas

- In 2012: 10 provinces are leading in dairy population
  1. Ho Chi Minh city  83,369 heads
  2. Nghe An      25,910 heads
  3. Hanoi        11,084 heads
  4. Son La       10,211 heads
  5. Long An      7,848 heads
  6. Lam Dong     5,346 heads
  7. Soc Trang    3,663 heads
  8. Tuyen Quang  2,761 heads
  9. Vinh Phuc    2,541 heads
  10. Tay Ninh    2,475 heads

3. Farm size

Farm size in Vietnam is mainly small scale, low productivity. DLP investigation shows:
- Approximate 20,000 dairy farms, average farm size: 5.3 head, in which: in the South: 12,626 farms with 6.3 head/farm, in the North: 7,013 with 3.7 head/farm, 384 farms with 20+ head/farm (about 1.95%)
- Number of farms with under 5 heads is decreasing, number of farms with 5-10 head/farm is increasing.
- In addition, there are medium and large scale farms with hundreds and thousands of head as: VN Future milk, Vinamilk, TH milk

4. Raw milk production and milk consumption

- Raw milk production has increased gradually since 2001 (about 64.7 thousand tons) to 381.74 thousand tons in 2012; average growth/year 18.87%
- In 2009 growth of raw milk was lowest in 10 years.
- From 2010 to now, raw milk has increased remarkably, with over 10%. In 2012, raw milk production reached 381,7 thousands tons, an increase of 10.5% compared to 2011
Table 3. Raw milk production 2001-2012

<table>
<thead>
<tr>
<th>No</th>
<th>Year</th>
<th>Dairy cattle (1000 heads)</th>
<th>Growth (%)</th>
<th>Raw milk (1000 tons)</th>
<th>Growth (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>2001</td>
<td>41,241</td>
<td>17.09</td>
<td>64,705</td>
<td>25.73</td>
</tr>
<tr>
<td>2</td>
<td>2002</td>
<td>55,648</td>
<td>15.41</td>
<td>68,455</td>
<td>21.25</td>
</tr>
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<td>3</td>
<td>2003</td>
<td>70,225</td>
<td>15.84</td>
<td>72,097</td>
<td>61.49</td>
</tr>
<tr>
<td>4</td>
<td>2004</td>
<td>90,706</td>
<td>20.02</td>
<td>151,314</td>
<td>19.43</td>
</tr>
<tr>
<td>5</td>
<td>2005</td>
<td>101,120</td>
<td>8.70</td>
<td>197,079</td>
<td>30.65</td>
</tr>
<tr>
<td>6</td>
<td>2006</td>
<td>113,215</td>
<td>8.73</td>
<td>213,953</td>
<td>9.21</td>
</tr>
<tr>
<td>7</td>
<td>2007</td>
<td>96,699</td>
<td>-12.86</td>
<td>234,438</td>
<td>8.56</td>
</tr>
<tr>
<td>8</td>
<td>2008</td>
<td>107,965</td>
<td>9.45</td>
<td>262,160</td>
<td>11.82</td>
</tr>
<tr>
<td>9</td>
<td>2009</td>
<td>114,611</td>
<td>6.00</td>
<td>278,193</td>
<td>6.11</td>
</tr>
<tr>
<td>10</td>
<td>2010</td>
<td>128,385</td>
<td>11.31</td>
<td>306,962</td>
<td>10.23</td>
</tr>
<tr>
<td>11</td>
<td>2011</td>
<td>142,702</td>
<td>10.98</td>
<td>348,444</td>
<td>12.65</td>
</tr>
<tr>
<td>12</td>
<td>2012</td>
<td>169,989</td>
<td>17.02</td>
<td>381,740</td>
<td>10.51</td>
</tr>
</tbody>
</table>

Milk consumption

- Consumption of milk and dairy products has increased remarkably. In 2000 milk consumption per capita was 8kg of fluid milk, it increased to 16 kg in 2012.
- Average raw milk per capita in 2012 was 3.93kg (about 25% of milk consumption).

Milk consumption per capita

<table>
<thead>
<tr>
<th>Year</th>
<th>Population (million people)</th>
<th>Milk consumption per capita</th>
</tr>
</thead>
<tbody>
<tr>
<td>2001</td>
<td>78,50</td>
<td>0.82</td>
</tr>
<tr>
<td>2002</td>
<td>80,00</td>
<td>0.98</td>
</tr>
<tr>
<td>2003</td>
<td>81,20</td>
<td>1.56</td>
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<tr>
<td>2004</td>
<td>82,50</td>
<td>1.83</td>
</tr>
<tr>
<td>2005</td>
<td>83,12</td>
<td>2.37</td>
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<tr>
<td>2006</td>
<td>84,00</td>
<td>2.57</td>
</tr>
<tr>
<td>2007</td>
<td>84,60</td>
<td>2.77</td>
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<tr>
<td>2008</td>
<td>85,30</td>
<td>3.07</td>
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<tr>
<td>2009</td>
<td>86,00</td>
<td>3.23</td>
</tr>
<tr>
<td>2010</td>
<td>86,40</td>
<td>3.53</td>
</tr>
<tr>
<td>2011</td>
<td>87,40</td>
<td>3.93</td>
</tr>
<tr>
<td>2012</td>
<td>88,00</td>
<td>4.34</td>
</tr>
</tbody>
</table>
Overview of dairy production

- Dairy production are really economic profit.
- No. of farms with under 5 heads/farm has decreased, 5-10 head/farm has increased.
- Limited land for dairy development, dairy farmers are difficult in broadening farm size.
- Dairy production in Vietnam are potential and opportunity from 2013 to 2020.

5. Strategy of dairy production to 2020

Development viewpoint

- Restructure dairy sector and combine to guarantee epidemic diseases, environment protection.
- Encourage organizations and individuals to invest in dairy sector.

5. Strategy of dairy production to 2020

Development objectives

- Dairy population will have reached 350,000 heads by 2015 and 500,000 heads by 2020.
- Raw milk production will have reached 701 thousand tons by 2015 and 1012 thousand tons by 2020.

II. FORAGE PRODUCTION IN Vietnam

1. Forage production

1.1. Forage cultivation

- From 4,68 thousand hectares of roughage cultivated up to 200 thousand hectares in 2010, in which: Northeastern, South East and North Central are biggest.
- Average growth rate in 2006-2010 was 47.99 %/year.
- Dense maize cultivation area are not much, about 3,071 ha, mainly in the South East (1.318 ha), Northwest (1.123 ha), lowest is Red River Delta (30 ha)
1.1. Forage cultivation

Some grass breeds have been imported to Vietnam in recent years, including:

- Grass: King grass (Pennisetum Purpureum), cỏ sá (Panicum maximum), Ruvi grass (Brachiaria ruziziensis), Paspalum grass (Paspalum atratum), Para grass (Brachiaria mutica), sorghum (Sorghum Sudanum), cỏ Pát (Paspalum sudanum), signal grass (Brachiaria decumbens), Sweet Jumbo và Superdan, cỏ VÀ 200, cỏ Getter.

- Legumes: Stylo (Stylosanthes guayacensis), legume mixed Aves, legume (Centrosema và Centro cavaclada).

2005 – 2010: Imported grass seed is 40 tons equal 45,000 ha grass cultivation, meets 7.8% forage requirement.

1.2. Agricultural by-products

Processing of by-products is about 60 million tons/year, in which:

- Rice straw: 40 million tons
- Sweet potato residue 0.45 million tons
- Peanut residue 0.55 million tons
- Maize stem 0.7 million tons
- Cassava leaves 0.3 million tons
- Sugar cane residue 4.0 million tons
- Molasses 0.5 million tons
- Pine apple residue 1.0 million tons
- Residue from agricultural products and vegetable processing 6-7 million tons.

Agriculture by – products are used about 30-40 % in total.
1.2. Agricultural by-products


The rest are not used due to:
- Farmers lack knowledge and techniques of processing, preservation and suitable usage of by-products as feed for ruminants
- Lack of policies on processing and preservation agricultural by-products as feed in dry season.

2. Problems

The causes of forage deficiency for ruminant production in Vietnam include:
- Land for forage cultivation is limited.
- Farmers do not have a habit to set up feedstuff areas for ruminant production
- Lack of policies on changing structure in agriculture production from plant cultivation into forage for ruminant.

2. Problems

- Intensive roughage cultivation and machinery application in cultivation, processing and preservation of forage are limited
- Service system does not develop in forage production and processing. Roughage market is not managed systematically
- Advanced techniques in breeding, cultivation, processing and preservation do not applied in practise
- Selection of good breed suitable to weather conditions in different ecological regions is limited
- Structure of forage breed is not suitable to each ecological region

STRATEGY OF FORAGE PRODUCTION TO 2015 & 2020

1. Goals
- Intensive forage cultivation with high yield breeds develop ruminant production
- Take advantages of ecological regions to develop grass and forage

2. Objectives
- Cultivated forage area will have increased from 396.67 thousand ha by 2015 and 509.37 thousands ha by 2020.
- Percentage of land for forage cultivation is 0.8% of agricultural land, it will have reached 4% by 2015 and 5% by 2020.
PART II: POLICIES

1. POLICIES ON DAIRY PRODUCTION

1. Policies on dairy breeding
   - Dairy nuclear breeding program:
     - Bulls for semen
     - Cows for heifers
   - Local dairy nuclear breeding program
     - Cows for heifers

2. Policies on dairy production
   - Decision 01/2012/QĐ-TTg dated 09/1/2012 issued policies on subsidizing application VietGAPH in agriculture, forestry and aquaculture
   - Dairy farms certified application of VietGAPH will be subsidized:
     - 100% cost of basic investigation, terrain survey, analysis of soil, water, air samples.
     - 50% cost of construction of transportation, irrigation system, pump station, low voltage station, waste treatment system, plumbing and drainage system of centralization livestock production areas met VietGAPH requirements.
     - Cost of rent for organizations realize assessment to certify safe products.

1. Policies on dairy breeding
   - National breeding program
   - Central budget subsidizes 1 times for breeding production, including:
     - Maximum 50% of cost production of nuclear cows.
     - Maximum 50% of infrastructure establishment (transportation, irrigation, waste management...) at breeding centers applying high techniques.

3. Dairy extension policies
   - Dairy production: breed, concentrates.
   - Intensive forage cultivation: forage seeds, fertilizers
   - Technical training:
     - Animal husbandry, preventive health care
     - Technique of feed processing, silage, waste treatment...
II. OTHER POLICIES

1. Importation
   - Breeding dairy cattle, forage breeds
   - No limitation.

2. Policies on investment encouragement

   Decree 61/2010/ND-CP dated 4/6/2010 issued policies on encouragement of firms investment in agriculture production, rural areas

   - Special advantage investment agriculture projects carry out breed production, centralization livestock production, application of biological technique in areas with special difficult social economic conditions.
   - Support of Government:
     - Exempt land use taxes (if land provided by Government).
     - Exempt rent fee for land since the date projects start operation (if rent land from Government).
     - If land rent from individuals, households: Government subsidizes 20% of land rent fee (according to regulated price) in 5 years since finish basic constructions.
     - In planning areas: exempt from land use fee if land is changed usage purposes.

   - Encouraged investment agriculture projects carry out breed production, centralization livestock production, biotechnology application at rural areas

   - Support of Government:
     - Exempt 50% land use taxes (if land provided by Government).
     - Exempt rent fee for land in 11 years since the date projects start operation (if rent land from Government). After that, fee for land rent are applied lowest price according to regulation of local government.
     - Exempt the projects from land use taxes for accommodation for workers, public areas.
2. Policies on investment encouragement

Training human resources
- Agriculture projects at supper small businesses: subsidized 100% domestic vocational training fee by Government.
- Agriculture projects at small businesses: subsidized 70% domestic vocational training fee by Government.
- Agriculture projects at medium businesses: subsidized 50% domestic vocational training fee by Government.
  - Training 1 times/year/labor in maximum under 6 months.

2. Policies on investment encouragement

Subsidize consultative services
- Agriculture projects at supper small businesses: subsidized 50% cost of consultative services including: investment, management, marketing investigation, legal, intellectual property, scientific research, technical transfer, quality management system in production.
- Agriculture projects at medium businesses: subsidized 30% cost of consultative services including: investment, management, marketing investigation, scientific research, technical transfer, quality management system in production.

2. Policies on investment encouragement

Support for market development
- Agriculture projects at supper small businesses: subsidized 70% advertisement cost by Government in the province where projects realized.
  - 70% cost of exhibition inland; free for market information, prices, services from government trade promotion organizations.
- Agriculture projects at medium businesses: subsidized 50% advertisement cost by Government in the province where projects realized.
  - 70% cost of exhibition inland; 50% free for market information, prices, services from government trade promotion organizations.

3. Policies on credit

Decree 41/2010/ND-CP dated 12/4/2010 on policies on credit for development agriculture, rural areas
- Organizations, individuals realized livestock production, services at the rural get loan with free pledge at maximum such as:
  - Individuals, households: not over 50 million VND.
  - Household provided livestock services: not over 200 million VND.
- Agricultural Cooperatives, farm ownerships: not over 500 million VND.
- Loan pay back period depends on rotation time, reimbursability, production planning, agreement between credit agencies and customers.
  - Rate: maximum at the rate of deposit at 1 month plus 3%/year.
XIN CẢM ƠN!
THANK YOU!
Appendix 1.3

Introduction of improved grasses on dairy farms: the case of Mulato II

1. General information
   Activities of Dairy Development Program

   MILK COLLECTION
   Milk Price – Milk Quality

   CONTROL → ENSURE
   MILK QUALITY (FOOD SAFETY)

   EXTENSION
   Training – Pilot farm
   Extension Service

   SPECIAL PROJECTS
   PPP
   Quality Risk Management System
   Pilot farm

   Extension activities
   Technical farm services:
   - Artificial insemination / Veterinary health care
   - Practical training on dairy husbandry and farm economics
   - Dairy advisory
   - Support farm organization

1. General information
   Contents of Presentation
   1. General information
   2. Planting Mulato grass
   3. Results
   4. Challenges
1. General information

Demo farm

- It is used as a farm model for small-scale dairy farmers in Binh Duong and neighboring provinces.
- Total 12 heads: 6 milking cows, 2 dry cows, 4 young stocks.
- 1,000 m² Mulato grass.

Pilot farms

- In the region of the dairy community.
- Where farmers can learn from each other and share experience.
- FCV organizes training sessions, and farmers share their own experience on dairy husbandry knowledge.

Mulato grass

- Brachiaria spp hybrids: B. ruziensis x B. decumbens x B. brizantha.
- Was planted at the Demo farm in 2009 and a Pilot farm in 2010.

2. Planting Mulato grass

Land preparation

- Plough deep from 20-25 cm.
- Rake carefully 2 times, take off wild grass. Land for planting should be soft, humid, and no wild grass.
- Make a row or hole/spot.
Appendix 1.3

2. Planting Mulato grass

Fertilizer & fertilization

Before planting:
- Manure: 2 tons/1,000m²
- Fertilizer (per 1000m²):
  - Phosphorus: 40 kg
  - Potassium: 30 kg

After planting:
- 20 days after planting, urea 50kgs/1000m²
- Manure (liquid) after each cutting

Seeding grass

- Preparing seeds before planting:
  - To dip seeds with warm water 42-45°C for 24hrs
  - Gets out/ makes seeds dried in shadow for 3hrs
  - Put in nursing bag from 3 – 5 days
- Clump (or stem): 150-180 days age, healthy.

Planting

- By seeds: 8 - 10 kg/ha
- Put seeds in row or hole or sowing
- Width between rows: 30-35 cm
- Cover land and press gently
  Notes: plant with mini-kills by pesticides

By stump: 4-5 tons /ha
- 4-5 limbs per hole
- Leaves of limb should be trimmed before planting

Care and Management

- Checks germination and growth rate
- Waters regularly
- Replanting the holes no germination
- Removing wild grass
- Avoids flooding
- Replants after 4-5 years
Appendix 1.3

2. Planting Mulato grass

Harvesting

- First cutting is 50-60 day after planting, the next cutting after 35-40 days.
- Cuts at 0.8 – 1.0 m height
- Leaves stump 10 cm above ground.
- 9-10 harvest times per year.
- Production: 20 – 25 tons/ha/ha.
  - Production of the first two cut in first year is 90% of average.

3. Results

Production of Mulato grass

<table>
<thead>
<tr>
<th>Farmer</th>
<th>Area for grass (ha)</th>
<th>Time</th>
<th># of cut per year</th>
<th>Production (ton/ha/year)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mr. Dat, Farmcode 3732</td>
<td>900 m²</td>
<td>2011</td>
<td>9</td>
<td>300</td>
</tr>
<tr>
<td>Mr. Thang, Farmcode 1445</td>
<td>1,268 m²</td>
<td>2011</td>
<td>9</td>
<td>300</td>
</tr>
<tr>
<td>Mr. Tran, Farmcode 1283</td>
<td>1,200 m²</td>
<td>2011</td>
<td>10</td>
<td>200</td>
</tr>
<tr>
<td>Mrs. Le, Farmcode 2736</td>
<td>3,088 m²</td>
<td>2010</td>
<td>9</td>
<td>280</td>
</tr>
<tr>
<td>Dame Tam, TDM, Binh Chinh</td>
<td>760 m²</td>
<td>2009</td>
<td>9</td>
<td>300</td>
</tr>
<tr>
<td><strong>Average</strong></td>
<td></td>
<td></td>
<td></td>
<td><strong>275</strong></td>
</tr>
</tbody>
</table>

- This production is achieved in top conditions:
  - Small size grassland, well-managed by farm owner.
  - Water dressing whole year round. Refills moisture after each cutting.
- At bigger land, it is expected the production is 30% lower.

Comparison with Elephant grass

- Planting: needs special care
- Production: as 90% production of Elephant grass
- Quality: high crude protein (10.6%)
- Palatable, soft and a lot of leaves
- Appetite: cattle prefers Mulato than Elephant grass

3. Results

Farmers opinions

- Planting: not easy to plant by seed
- Growth is slow after seeding
- Production: acceptable
- Palatable, soft and a lot of leaves
- Must be harvested on time
3. Results

Conclusions from demo and pilot farms

- Mulato: well adapted with climate and environment in Binh Duong, Long an, Tay ninh and Ho Chi Minh City.
- Needs special care. Good productivity.
- High percentage of crude protein -> it is good forage for high milk yield.
- Mulato is palatable, soft. Dairy cattle like it.
- To have further research on Mulato productivity in Vietnam.

4. Challenges

- Farmer gets used to Elephant grass. To convince them to change, it needs much time.
- During the change process, it is shortage of forage supply at farm.
- Seed is not available.
- To have optimum production, it needs investment for spraying (sprinkle) system.
Appendix 1.4

"Improved Forage Strategies for High Yielding Dairy Cows in Vietnam"

Workshop January 17th and 18th, 2013, Liberty 4 Hotel, Ho Chi Minh City

Organised by:

Group Assignments

Discussion questions (record contributions on flip charts)

a. Is the content of poster complete in terms of strategies used? Are there any strategies that you would like to add?

b. Looking at the different strategies, what issues are encountered in implementing those strategies?

c. Rate issues in order of importance (1 = most important)

d. Rate strategies in order of importance (1 = most promising)

Examples:

<table>
<thead>
<tr>
<th>Additional experiences &amp; strategies</th>
<th>Promising strategies</th>
<th>Rating</th>
<th>Key issues</th>
<th>Rating</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pearl millet – works in dry season in South</td>
<td>Import from other countries</td>
<td>3</td>
<td>Not dependable</td>
<td>2</td>
</tr>
<tr>
<td>Sorghum – works well in Central Highlands</td>
<td>Drought tolerance</td>
<td>3</td>
<td>Disease resistance</td>
<td>2</td>
</tr>
<tr>
<td></td>
<td>Outsourcing to crop farmers</td>
<td>3</td>
<td>Competition with export</td>
<td>1</td>
</tr>
</tbody>
</table>

Group session Day 1

- 5 groups, each group will look at 5 posters:
  1. Improved grasses & forages
  2. Forage conservation
  3. Crop residues
  4. Land & capital requirements for growing forage
  5. Improving farmer’s management – Development, testing & introduction of innovations

- Read the poster
- Discussion & input on sheets (see next slide)
- Switch to another poster for next round; add to work of previous group

Field excursion

Questions for reflection

1. What’s your general impression of the farms?
2. What limitations does each farmer meet for the improvement of forage/roughage supply?
3. Which strategies does each farmer apply to increase the quantity and quality of the roughage? What’s your opinion on these strategies?
4. What recommendations would you like to give each farmer?
5. What possibilities do you see to promote these strategies to other farmers? What needs to happen to achieve this?
Appendix 1.4

Group Session Day 2

Choose 1 group:

1. Conducive Policies & Strategies
   - On issues that need to be addressed by authorities, private sector, knowledge institutes etc.

2. Promising technical options
   - How to further develop the most promising innovations for improved forage supply and forage quality on small scale and large scale farms

3. Extension, education & research for improved management
   - How to advance implementation and cooperation in areas of farm advice, knowledge exchange & innovation development that are needed to address the bottlenecks in forage production; attention for small and large scale farms

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Group work - Day 2

<table>
<thead>
<tr>
<th>Nhóm 1</th>
<th>Nhóm 2</th>
<th>Nhóm 3</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cục chức năng &amp; chức năng khác</td>
<td>Cục chức năng &amp; chức năng khác</td>
<td>Cục chức năng &amp; chức năng khác</td>
</tr>
<tr>
<td>1. Thực hiện các dự án hỗ trợ chuyển đổi</td>
<td>1. Thực hiện các dự án hỗ trợ chuyển đổi</td>
<td>1. Thực hiện các dự án hỗ trợ chuyển đổi</td>
</tr>
<tr>
<td>3. Phát triển các báo cáo chuyển đổi</td>
<td>3. Phát triển các báo cáo chuyển đổi</td>
<td>3. Phát triển các báo cáo chuyển đổi</td>
</tr>
</tbody>
</table>

Discussion questions:

1. Review selected strategies that support improved availability and quality of forage - How feasible are they in terms of expected adoption, expected impact, cost/benefit, requirements in terms of labour, land, capital.

2. Draft an action plan for implementation of most promising strategies, including role of stakeholders
   - What should be done?
   - How should it be done?
   - Who should be involved? (and do you expect commitment?)
   - Who will take the lead?
   - What is needed to start?
   - When could it start?

3. Prepare presentation by powerpoint or flip chart
Appendix 2 - Comments of participants on posters

Comments of participants on the poster 1: Improved grasses and forages to increase quantity and quality of roughage:
- Government policies need to support the turning of land used for other purposes into land for forage;
- We need a comparison between profitability for forage and for other land uses; if forage is more profitable farmers will switch to forage production;
- Farmers need to know how and when to harvest the forage and about the nutritious value for dairy cow;
- Need a forage variety that is suitable for the dry season in the South;
- Need a good laboratory to analyse the quality of forages;
- Hard criteria like “kg dry matter/hectare” should be used as more concrete parameter for yield;
- Less land: how to get optimum production/ha;
- Mixed grass mixtures;
- Cay aha dao (cherry tree), do mai, stylo, sorghum, sugarcane or sugarcane leaf can be used;
- Suitable feed for dairy cows depends on the ecological conditions
- Guatemala grass is suitable for the North;
- Vegetables like ‘cay cai dau’ are also suitable for dairy feed in the winter in the North.

Comments of participants on poster 2 - Forage conservation
- Alfalfa < 12% preserved in 1 year;
- Silage: Corn, rice straw, fresh grass;
- Grass is difficult to dry in the rainy season;
- Machines are needed to make and pack hay;
- Difficult to make silage of corn – how to cut the corn seeds?
- Molasses can be used to decrease humidity of silage;
- What is the use of grass silage? It is double the cost of fresh grass;
- Farmer has insufficient knowledge about silage making;
- Making silage of maize stover is expected to increase in the future;
- Compression of silage bag is important.

Comments of participants on poster 3 - Crop Residues
- Urea: addition is 3-5% of dry weight not fresh produce (correction to poster);
- Use of rubber seed, banana tree stem, groundnut straw, jackfruit waste, jackfruit seed waste, market waste, sweet potato plants, lettuce waste, maize cobs (without seed), pineapple residue, maize, cassava (leave, tuber), groundnut, coffee husks, cocoa husks, passion fruit skin, cotton seeds (1 kg of cotton seed per day per cow);
- Technique to make rice straw silage in anaerobic conditions is difficult, as is packaging;
- Is the use of urea and lime poisonous?
- “maize is not good for dairy cows, better use it for calves and dry cows”
- Need an organization/institute to check the nutritious value of crop residues, and make recommendations for farmers.
Comments of participants on poster 4 - Land & capital requirements for growing forage

- Need to look at ratio cows: land;
- Seed availability and seed quality need to improve;
- Import seed;
- Contract farming is risky, e.g. side selling of forage, no full honouring of contract;
- Rent land to grow forage;
- Need instruction materials to guide the farmers how to grow forage;
- Want to develop the system to certify quality of forage;
- Want to have a place where grass seed is available;
- Want to switch rice fields into land to grow forage, for which drainage is important.

Comments of participants on poster 5 - Development, testing and introduction of innovations to improve farm management

- Develop a team of agronomists/extension staff between farmers and government departments/knowledge institutes;
- Extension team needs to be well-trained, have much knowledge;
- Issues: instruction from foreign expert has a different level than in Vietnam;
- Difficult to import grass seed – government should make import easier;
- Training on using crop residues for dairy cows;
- Technology to make corn silage or grass silage has been available for long time; need updated technology;
- Farmers want to have a business model in which government supports them with capital and technology depending on their farm size.
Appendix 3 - Data on farms visited during field excursion

During the field visit participants were given the following questions for reflection which were discussed shortly on day 2.

1. What’s your general impression of the farms?

2. What limitations does each farmer meet for the improvement of forage/roughage supply?

3. Which strategies does each farmer apply to increase the quantity and quality of the roughage? What’s your opinion on these strategies?

4. What recommendations would you like to give each farmer?

5. What possibilities do you see to promote these strategies to other farmers? What needs to happen to achieve this?
**THÁNH PHÚ DAIRY FARM**

Chủ trại: Bà Phạm Kim Lê
Owner

Địa chỉ: 194, K2, ấp Chợ, Xã Tân Phú Trung, Huyện Củ Chi, TP. HCM
Address

---

**Tổng đàn:** 77
Herd size

**Đjenis tách đang có:** 3.5 ha
Grassland area

**Bò sữa:** 30
Lactating cow

**Giống bò:** Sind x HF
Breed

**Số người làm tại trại:** 8
Labour

**Lượng sữa (kg/ngày):** 430
Production (kg/d)

**Khó khăn hiện tại:** Thiếu diện tích đất trồng cỏ
Current constraint: Lack of land for grass

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**LỊCH SỬ HÌNH THÀNH VÀ PHÁT TRIỂN**

**FARM HISTORY**

**1999:** Thành lập trại, vốn ban đầu 200 triệu đồng; 10 bò và 2ha có trang bị hệ thống tự động.
Starting farming with 200m/s VND, 10 heads and 2.0 ha grassland with irrigation sprinkler system

**2002:** Đầu tư máyắt sữa
Investment milking machine

**2010:** Xây dựng Biogas, hệ thống làm mát và trồng cỏ mulato
Building Biogas, ventilation system and planting mulato grass

**2011:** Trang bị bồn lưu tại trại
Installing the cooling tank

**2012:** Đầu tư hệ thống vật sữa tự động
Investment the milking parlour system

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**1999** | **2002** | **2010** | **2011** | **2012**
Tổng đàn: 60
Herd size
Bò vắt sữa: 21
Lactating cow
Giống bò: Sind x HF
Breed
Lượng sữa (kg/ngày): 320
Production (kg/d)

Diện tích đồng cỏ: 1.3 ha
Grassland area
Số người làm tại trại: 5
Labour

LỊCH SỬ HÌNH THÀNH VÀ PHÁT TRIỂN
FARM HISTORY

2001: Thành lập trại, vốn ban đầu: 80 triệu đồng; 5 bò; chăn trỏng cỏ, nuôi bò bằng cỏ tự nhiên.
Start farming with 80mls VND, 5 heads and using nature grass for cow.

2006: Đầu tư máy vắt sữa
Investment milking machine

2011: Xây dựng Biogas, hệ thống làm mát cho bò, trồng cỏ mulato và trang bị hệ thống tưới cho đồng cỏ
Building Biogas, ventilation system and planting mulato grass with irrigation sprinkler system

2012: Mua thêm đất và xây mới thêm chuồng trại
Buying 0.5 ha extra land and building a sustainable stable
Appendix 4 - Workshop evaluation by participants

**General impression of the workshop (n= 21)**

<table>
<thead>
<tr>
<th>Impressive</th>
<th>Neutral</th>
<th>Unimpressive</th>
</tr>
</thead>
<tbody>
<tr>
<td>- Can gather all involved parties in dairy chain to this workshop so that it created a chance for them to talk and exchange experiences;</td>
<td>- It’s so so;</td>
<td>- Not as effective as I expected;</td>
</tr>
<tr>
<td>- Good program, informative content and good logistics;</td>
<td></td>
<td>- The participants could not follow the presentation well because the meeting room had many pillars.</td>
</tr>
<tr>
<td>- Provided participants the information about new varieties of grass in Vietnam;</td>
<td></td>
<td></td>
</tr>
<tr>
<td>- The way of discussion in the workshop to find out the issues &amp; solutions;</td>
<td></td>
<td></td>
</tr>
<tr>
<td>- Provided useful information for dairy farmers;</td>
<td></td>
<td></td>
</tr>
<tr>
<td>- Excellent;</td>
<td></td>
<td></td>
</tr>
<tr>
<td>- Got opinions from all actors of dairy chain;</td>
<td></td>
<td></td>
</tr>
<tr>
<td>- Very impressive;</td>
<td></td>
<td></td>
</tr>
<tr>
<td>- Informative;</td>
<td></td>
<td></td>
</tr>
<tr>
<td>- Useful and practical;</td>
<td></td>
<td></td>
</tr>
<tr>
<td>- Logic program and good time management;</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Highest rated elements**

| Day 2 – Group work (action planning) | 11 times mentioned |
| Day 1 – Group work on posters        | 7                   |
| Day 1 – Field excursion               | 5                   |
| Day 1 – Oral Presentations           | 3                   |
| Day 2 – Lessons learned from field excursion | 3               |
| Day 2 – Oral Presentations           | 3                   |

In general the workshop was well appreciated by the participants. Suggestions for improvements were given concerning the organization, activities, facilitation, and logistics of the workshop.

**Suggestions for improvement**

**Workshop organization**

- The type of participants should be more balanced among stakeholders:
  - Invite more dairy farmers (small and medium size) from other provinces to know more about the facts of Vietnam;
  - Invite more people from MARD/DARD/government (more powerful) to participate in the workshop;
  - Invite more international participants to share ideas.
- Give more time for discussion, Q&A because they are so important.
Activities in workshop
- Provide more info about the effect of each kind of grass (e.g. the increase in milk production when using a certain kind of grass);
- Should provide more report of new researches or study from universities or government institute or international countries;
- Group work in second day did not show the specific solutions and action for each issue, just in general.

Facilitation
- The national facilitators seemed inexperienced and did not make the group discussion very effective.

Logistics
- The meeting room had many pillars which affected the view of participant. It was also noisy during meeting by drilling sound.

Intended individual follow up activities by participants as a result of this workshop (mentioned during the evaluation):

- Plan some activities to assist farmers to improve forage production;
- Consider importation of grass seed to sell in Vietnam
- Improve the soil quality of my land to improve the productivity of forage
- Study more about the technology of forage production
- Start to grow sorghum
- I will report to my director to set up the new policies for dairy sector and forage production
- I will write a plan for developing the forage for dairy cows
- Improve the skill of making silage for my farm
- Start to grow maize and make maize silage.
Appendix 5 - Workshop program

“Improved forage for high-yielding dairy cows in Vietnam”

Date: January 17 and 18, 2013
Venue: Liberty 4 Hotel in Ho Chi Minh City

Day 1: State of the Art – sharing of experiences

9.00 Opening: DG Livestock Production, MARD and Netherlands Agricultural Councillor

State of the art

9.15 Current policies regarding dairy and forage development in Vietnam

Presentation by Mrs Hoang Thi Thien Huong, Dep. of Livestock Production, MARD

9.30 Recent innovations in grass and forage production for dairy production
Presentation by dr. Ngo Van Man (university of Agriculture & Forestry HCMC) and ir Bram Wouters (Wageningen UR Livestock Research)

10.15 Introduction to group work (after break) and excursions (afternoon)

10.30 Coffee break

10.45 Group work day 1 - Review of the state of the art regarding use and innovations around forage production and conservation.

Learning from practice

12.15 Lunch & field excursion

14.00 Visit to dairy farms (organized by FC Vietnam)

17.30 Arrival back in Ho Chi Minh City

18.30 Dinner
Day 2: Setting the Agenda for the Future

Promising strategies
8.30 Lessons learned from field excursion

8.45 Introduction of improved grass in practice – the experience of DDP Vietnam
Presentation by Mrs Nguyen Thi Bich Hang, FrieslandCampina Vietnam

Implementation strategies for promising options
9.15 Presentations on group work of first morning and selection of promising strategies for further development for large scale and small scale farms

10.00 Group work Day 2 - discuss strategies and prepare action plans in three groups (group composition based in interest):
   1. Conducive Policies & Strategies – on the issues that need to be addressed by authorities
   2. Promising technical options - on the most promising innovations for improved forage supply and forage quality on small-scale and large scale farms.
   3. Enhanced ways for implementation and cooperation - on new forms of implementation and cooperation in the areas of farm advice, forage production (like contract farming), knowledge exchange & innovation development.

12.00 Lunch break

13.00 Continuation of group work

Agenda and action plans
14.00 Plenary presentations and discussion of action plans
   Discussion on promising strategies, identification of possible projects, and further action planning.

15.00 Break

15.15 Conclusions and follow up agreements
   - ranking of importance of planned activities
   - indication of interest for participation in planned activities

16.00 End
Appendix 6 - Particulars of workshop participants

Mr Thomas Hooft  
AGRIVINA LTD  
45 Nguyen Tu Luc street, Da Lat city, Vietnam  
nhatly@dalathasfarm.com; thomashooft@dalathasfarm.com

Mr. TA QUOC TRUNG  
Cocono  
Proconco Co., Bien Hoa Industrial Zone 1, Dong Nai province  
tqtrung@conco.com.vn; 0919151441

Nguyen Quynh Nhat Ly  
AGRIVINA LTD  
450 Nguyen Tu Luc, Da Lat  
nhatly@dalathasfarm.com  
0982156923

Mr NGUYEN HUNG CUONG  
Cocono  
Proconco Co., Bien Hoa Industrial Zone 1, Dong Nai province  
hungcuong@conco.com.vn  
0982564454

Mr Gonen Harel  
AGSEM

Vu Thi Ngoc Hanh  
All Tech company  
Block 104 / 6-4 Street No 4, Amata Industrial Zone, Dong Nai province  
hvu@alltech.com  
0908694307

Ms Thuy Anh  
Da Lat Milk  
9K Hai Ba Trung street, Ward 6, Da Lat city, Lam Dong province  
thuyanhafc@gmail.com  
0974122760

Mr Mr Nguyen Ngoc Con  
Dairy farmer  
Hung Viet Farm, Hung Vuong street, Long tam Ward, Ba ria City, Ba ria Vung tau Province.  
via: hang.nguyenthibich@frieslandcampina.com  
0909337477

Mr Nguyen Ngoc Con  
Dairy farmer  
Hung Viet Farm, Hung Vuong street, Long tam Ward, Ba ria City, Ba ria Vung tau Province.  
via: hang.nguyenthibich@frieslandcampina.com  
0909337477

Dr Vo Lam  
An Giang University  
18 Ung van Khiem Street, Long Xuyen City, An Giang province  
volam.agu@gmail.com  
0918104161

Mr Vo Van Thang  
Dairy farmer, DDP  
277/6 - Block 15 – Phu Binh commune - An Phu ward – Cu Chi district – HCMC  
via: hang.nguyenthibich@frieslandcampina.com  
08 3794 8644

Mr Nguyen Thi Hong Nhan  
Can Tho University  
nthnhan@ctu.edu.vn  
0919434899

Mr Pham Kim Le  
Dairy farmer, DDP  
194 – Block 2 – Cho hamlet – Tan Phu Trung ward – Cu Chi district – HCMC  
tranvantre@gmail.com  
0126 4729577

Ms Tran Thi Bich Nguyen  
Breed Centre  
Centre of animal genetics and seed evaluation & management - 176 Hai Ba Trung street, Dist 1, HCMC  
bnguyen@gmail.com  
0909095714

Mr Tran Van Dat  
Dairy farmer, DDP  
77C - Chanh hamlet - Duc Lap Ha commune - Duc Hoa district - Long An province  
via: hang.nguyenthibich@frieslandcampina.com  
0166 9516778

Mr Guillaume Dutreutre  
CIRAD  
deteurtre@cirad.fr
Mr Le Dinh Kham  
DARD Ha Noi  
Cattle Breeding Development Centre of Ha Noi  
via: hang.nguyenthibich@frieslandcampina.com  
0912227234

Mr Tran Van Chat  
DARD Nge An  
via: hang.nguyenthibich@frieslandcampina.com

Bill Jovel  
DARD of HCMC

Mr W. Hofman  
De Heus  
whofman@deheus.com

Mr Dinh Van Tuyen (Theo)  
De Heus  
An Trang industrial Zone, Truong Son, Hai Phong city  
via: whofman@deheus.com

Mr Nguong Cong Chung (John)  
via: whofman@deheus.com

Nguyen Hoang Sang  
Block 2-2-CN, My Phuoc industrial Zone, Ben Cat district, Binh Duong province  
jack.sang@deheus.com.vn  
0939852695

Nguyen Thi Yen Nhi  
Block 2-2-CN, My Phuoc industrial Zone, Ben Cat district, Binh Duong province  
saint.nhi@deheus.com.vn  
0918672689

Nguyen Thi Xuan An  
Block 2-2-CN, My Phuoc industrial Zone, Ben Cat district, Binh Duong province  
anan.an@deheus.com.vn  
0902667444

Mr Hieu  
Dongnai Dairy cow company  
via: qthieu68@gmail.com

Mr Tran Hoang An  
Evergrowth Coop  
33 Hung Vuong road, ward 6, Soc Trang province  
evergrowth.coop@yahoo.com.vn  
0915650050

Huynh Giang Lam  
Evergrowth Coop  
Chac Tung-Tai Van- Tran De dist., Soc Trang  
evergrowth.coop@yahoo.com.vn

Mr Nguyen Mai Vinh Quang  
Fresh Studio  
86 Cao Trieu Phat, Hung Gia 4, Phu My Hung, Dist 7, HCMC, Vietnam  
quang.nguyen@freshstudio.vn  
0908260114

Mr Alex van Andel  
Fresh Studio  
86 Cao Trieu Phat, Hung Gia 4, Phu My Hung, Dist 7, HCMC, Vietnam  
alex.van.andel@freshstudio.vn

Mr Sybren Attema  
FrieslandCampina  
sybren.attema@frieslandcampina.com  
0650 375 44 22 / 0974 82 96 96

Nguyen Huu Thuoc  
FrieslandCampina  
thuoc.nguyenhuu@frieslandcampina.com  
0938645451

Mr Luu Van Tan  
FrieslandCampina Vietnam  
tan.luuvan@frieslandcampina.com  
0650 375 4422 / 0913 70 9125
Mrs Nguyen Thi Bich Hang
FrieslandCampina Vietnam
hang.nguyenthibich@frieslandcampina.com
0650 382 8183 / 0913 69 1336

Dr Su Thanh Long
Ha Noi Agric. University
Animal Health Dept., Agricultural University
Ha Noi
sulongjp@gmail.com
0904870888

Dr Nguyen Xuan Trach
Ha Noi Agricultural University
Agricultural University Ha Noi
nxtrach@hau1.edu.vn
0904148104

Duong Xuan Tuyen
Institute of Breeding of Southern VN
94/1056 Duong Quang Ham street, Ward 6,
Go Vap district, HCMC
dxtuyen@gmail.com
0913774977

Mr Nguyen Danh Tuyen
Kanematsu Corp
Floor 12th, DAEHA Trade Centre, 360 Kim Ma street, Ba Dinh district, Ha Noi
tuyen@kanematsuhan.com.vn
0982151815

Mrs Luu Thi Ma Lan
Kanematsu Corp

Mrs Hoang Thi Thien Huong
MARD
Breeding Office - Ministry of Agricultural & Rural Development
hoangthienhuongvn@gmail.com
04 3734 5442 / 0913 307019

Dr Tong Xuan Chinh
MARD DLP
Breeding Office - Ministry of Agricultural & Rural Development
chinhtx.cn@mardgov.vn;
hoangthienhuongvn@gmail.com

Ms Duong Thi Thanh Ha
Minh Dang Company
Ha Huy Tap, District 7
minhdangco@gmail.com
0854123691

Dr Om Dangi
Minh Dang Company
minhdangco@gmail.com

Huynh Nguyen Phu Quoc
Minh Dang Company
minhdangco@gmail.com

Mrs Tran Thi Le
National Extension Centre
tranlenafac@yahoo.com,
hoangthienhuongvn@gmail.com
0904321543

Nguyen Van Bac
National Extension Centre
135 Paster street, district 3, HCMC
backnqg@yahoo.com.vn
0918357683

Mrs Daphne Dernison
Netherlands Embassy
daphne.dernison@minbuza.nl

Mrs Truong Thi Dung
Netherlands Embassy
DEAHA office tower
366 Kim Ma street, Dong Da district, Ha Noi
truong-thi.dung@minbuza.nl
0904009293
Mr Stephan Cassidy
Provimi
stephen.cassidy@vn.provimi.com

Luong Thi My Linh
Provimi
Floor 4, CotecCon tower
linh.luongthimy@vn.provimi.com
0908025041

Tran Duc Hung
Provimi
236 / 6 Dien Bien Phu street, Ward 17, Binh Thanh district, HCMC
hung.tranduc@vn.provimi.com
0938300327

Rami Ofer
Sun Earth
r.ofer@sun-earth.jp
0972524457

Mr Le Khac Cuong
TH Milk
Dong Thanh, Dong Hieu, Nghia Dan, Nghe An
cuong.lekhac@thmilk.vn
0904040409

Mr Nguyen Le Thang
TH Milk
Dong Thanh, Dong Hieu, Nghia Dan, Nghe An
tuan.voanh@thmilk.vn
0984004075

Dr Ngo Van Man
Univ. Agriculture & Forestry, HCM City
ngoqman@yahoo.com.vn

Mr Nguyen Van Hiep
Univ. Agriculture & Forestry, HCM City
nguynvanhiep@yahoo.com
08 37245079 / 0909634071

Dr Nguyen Quang Thieu
Univ. Agriculture & Forestry, HCM City
qthieu68@yahoo.com
08 3896 3353 / 0913 850 960
Mr Nguyen Kim Cuong
Univ. Agriculture & Forestry, HCM City
via: qthieu68@gmail.com

Mr Nguyen Van Hao
Univ. Agriculture & Forestry, HCM City
via: qthieu68@gmail.com

Mr Chau Chau Hoang
Univ. Agriculture & Forestry, HCM City
chau.chauhoang@gmail.com
0903834265

Mr Bram Wouters
Wageningen UR Livestock Research
bram.wouters@wur.nl
+31 320 293374

Mr Jan van der Lee
Wageningen UR Livestock Research
jan.vanderlee@wur.nl
+31 317 48134