

Report on Visit to Vietnam from 22 – 30 April, 2007.

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PermVeg and Year Round Supply projects.



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1 Introduction

From April 23 till April 30 a visit was brought to Vietnam to assist with the PermVeg project and with the Year Round Round supply of vegetables project.

The PermVeg project is a cooperative project between Wageningen University and Research Centre (WUR) and Hanoi Agriculture University (HAU) carried out by Pham Thi Thu Huong in order to obtain a PhD.

The second goal of the visit was to find a suitable location to implement an experiment for the Year Round Supply project. This project is sponsored by the Dutch Ministry of Agriculture, Nature and Food Quality. The project Year Round Supply is carried out together with Cao Hong Luyen from Fresh Studios Hanoi.

2 Report on activities

23 April Hanoi Year Round Supply

Discussion with Luyen for planning the visit to Moc chau from 27/04 till 28/04.

Moc Chau is located approximately 200 km west of Hanoi and halfway in between Hoa Binh and Son La. The drive from Hanoi to Moc Chau takes about 4 hours. The altitude of the area is about 900 to 1100 meter above sea level. The area is mountainous but there are quite a few locations where the fields are quite leveled. However, the combination of flat fields of some substantial acreage with a reliable water supply is quite rare.

The area around the city of Moc chau is expected to have higher potential for temperate vegetable cultivation demonstration trials than Hoa Binh. This because the climate is more in favour for the cultivation but also the potential for transfer of knowledge on cultivation and techniques to other farmers is higher. The proposed farmers seem to be keener as well on cooperation. By Hoi and Luyen a fieldtrip was made to the Moc Chau area prior to the visit of Luyen and Herman and a detailed report of this fieldtrip is given in annex 1.



Map of the area around Moc Chau in North Vietnam

Vegetable cultivation just started there to improve so farmers are keen on receiving information. Proposed is to invest money in equipment needed for the experiment which can be handed over to the farmers instead of giving money to the farmers from which they have to buy equipment.

Difference between summer and winter cultivation of vegetables is present. Vegetable cultivation in summer is more profitable. What do farmers cultivate in wintertime? Grow vegetables that are then suitable for the market in that period? What are the vegetables with market potential in summer and which ones are having potential in wintertime? Luyen's information was that in wintertime the same vegetables are cultivated but to a lesser volume. Winter season is only October till January. However, it is important to demonstrate vegetable cultivation in that period as well since opportunities are present to gain some market in this period as well. Quality of highland products are much better compared to lowland products and by a marketing strategy there are possibilities to overcome this problem.

In order to manage the experiment a person is needed there on the spot for organizational aspects, managing the experiment and for doing the observations. Luyen has to travel twice a month to the field.

Driptide or dripline choice: streamline driptide is probably too thin for practical use by the farmers. The purpose is to show the farmers the effect of drip irrigation. Based on that expected must be that for a better effect driplines or laterals will be advised to use. In that case we also should demonstrate the effect of these types instead of using the cheaper type which has a shorter lifespan. Better is to choose right away the thicker type dripline with a wall thickness of 0.9 mm which would be suitable to the local condition.

For this quotations have been asked from Netafim and from Asia Irrigation. It seems that Asia irrigation is more detailed in the quotation and offers more service and information (Annex 4 and 5).

What equipment needed for the experiment is still missing?

- Raising material for seedlings (trays and potting soil)
- Drip irrigation (choice for drip line with thicker lines is recommended: last longer and it also serves as an example to local farmers)
- Cultivation materials
- Pesticides and fertilizers

24 April Hanoi and Son Du (Dong Anh district)

PermVeg

Visit Dr. Vien at Hanoi Agriculture University.

Visit of the experimental field at Son Du commune in the Dong Anh district (approx 1 hr. drive from Hanoi to the North West). Field looks fine. Beds are made and look quite nice with a same surface etc. Also Bamboo sticks are placed in the right position. Only thing that is missing are permanent poles. Decided was to put 8 poles in total on the corners of the net fields on the outside borders of the experimental field. (in this way also the sticks can be sighted into the right position). The top layer of the experimental field shows different textures and also different growth in weed vegetation is visible. It looks like this is linked with the cultivation of previous crops (bare, sweet corn, sweet potato, French bean). Recorded will be where previous crops have been cultivated.

Next to the field soy bean is cultivated. Beans will be harvested and stem residues will be used for composting and later on mixed with chicken manure.

Canals (ditches) for irrigation are dug and look fine.

Amaranth seeds did not germinate properly, the green variety should be present but only red amaranth is present but to a low extend, only a few plants can be seen. In the seed batch some contamination with seeds of the red amaranth was present.

Seedlings are raised for welsh onion and Chinese kale. Seedlings of welsh onion seems very small still. On May 1 probably the plants will not be tall enough, therefore Huong proposes to buy other seedlings and sell the ones she raised. The bought seedlings will be split up into 4 equal lots to be used for planting per block. Chinese kale is raised on 2 beds and the plants of 2 beds will be divided into 4 lots, each lot consisting of a half bed, which will be used per block.

Rain gauge and thermometer will not be placed directly on the field but on a place nearby. This because the risk is present that the equipment will be stolen and the measurements will also not recorded accurately. Most probably the gauge and thermometer will be installed at the farm behind the field (100 – 200 m distance).

Seeds of all other crops are available.

Soil sampling will take place on April 30 and sowing planting takes place on May 1

With some crops alluvial soil will be amended and with other crops not. With amaranth the soil will be applied by broadcasting, with sweet corn soil will only be applied at the sowing holes for the seeds, just as farmers practice.

25 April Hanoi

PermVeg

Discussion on forms that will be used for recording data:

Forms for recording labour requirement almost finished.

Forms for harvest recording

Forms for pesticide/insecticide input

Forms for recording climate per month

Forms for crop observations (flowering, pests, diseases)

With labour difference has to be made between labour per plot and can be pointed directly to a crop and general activities (making manure/compost, buying manure/transport material, digging canals, maintenance main canals which can not be allocated directly to a crop. Perhaps based on given rates of manure or compost labour also has to be proportional allocated to a crop. For instance if 10 hours is needed for organizing the manure and compost and 20 % of the manure and compost is used for a certain crop then perhaps 2 hours can be allocated to that crop.

Soil sampling:

A decision must be taken about timing of soil sampling on chemical analyses. The timing before starting the experiment gives no problems. But after 6 months it is more difficult since then one crop would just have received fertilization while another plot has received fertilization 4 weeks ago already. Perhaps it is an idea to consider sampling approximately after six months per plot but only then in the period between harvest of the old crop and the amending of the manure for the next crop.

The same goes for bulk density sampling. Seeing that it is almost impossible to sample while a crop is cultivated it is best to sample also immediately after harvest.

On April 30 ring samples will be taken from the whole field (in a way the field should be equal) – Procedure of sampling is as follows: Level the field a bit first, take out a ring sample of 0 - 5 cm depth and remove this sample, with a shovel or drill remove excess soil from the drilled hole until the level of 5 cm depth is reached with a diameter of 50 cm approx. Take another sample with the ring from the depth of 5 till 10 cm and keep this sample. Be sure that the ring is completely filled with soil. Cut off excess soil with a sharp knife alongside the edges of the ring (bottom and top) from outside the ring. Place the end caps on the top and bottom of the ring. Write with a pen on the ring where the sample was taken and from which layer. After this dig with a shovel until a depth of 15 cm is reached and take the sample for 15-20 cm the same way as it was taken for 5-10 cm.

Cultivation period:

When a crop cultivation period is shorter or longer than the expected period then just let the crop grow as practice and start with the next crop as practice. In theory it could be possible that a different cultivation period than the calculated period for this crop has to take place. However, some crops can only be cultivated in certain season of the year. If the prolonged or shortened cultivation results in a distortion of the expected period of cultivation a new sequence (omitting a crop or implementing a new crop is maybe an option?) should be made.

Box with rings and drill is present at Noi Bai airport at the customs.

Taxes must probably be paid. (Information received later from Huong: 5% of the indicated value has been paid)

26 April Son Du (Dong Anh district)

PermVeg

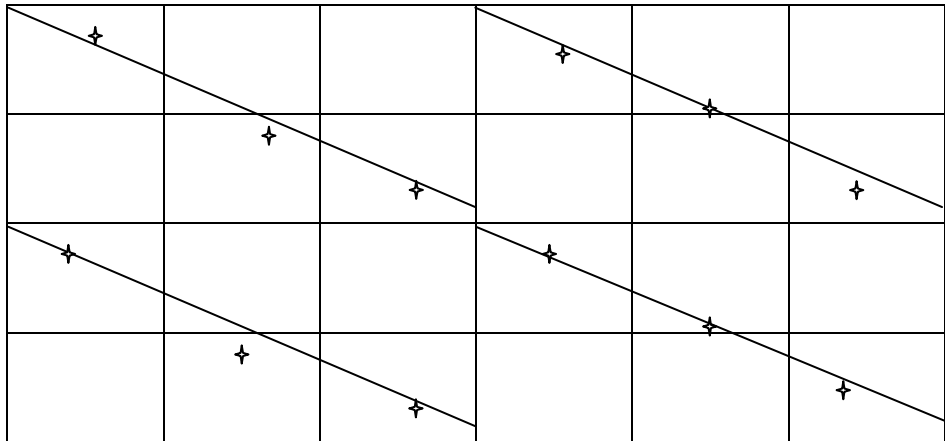
Visit experimental field.

Chinese kale is attacked by flea beetles. Decided is to spray the same afternoon still to control the flea beetles.

Thermometer and rain gauge will be installed at Mr. Gioi's place. Mr. Gioi is the chairman of the local commune where the experimental field is.

Huong has recorded the locations of the previous crops on the field together with Mr. Gioi.

Positions where samples for physical property will be taken are marked. Every fourth bed from the right per plot bordering the diagonal was marked (see figure)



27 April Moc Chau Year Round Supply

A detailed report on this visit is given in Annex 2 included recommendations for site selection suitable for the experiment.

Visit Mr. Mai Duc Thinh, director cooperative (company 2 in mentioned in the report of Annex 1) and visit to proposed locations for the experimental field.

28 April Moc Chau Year Round Supply

Visit to mr Loi farm and visit to the proposed sites for the experiment.

Main conclusions from this visit were:

At this moment none of the proposed sites seems immediately suitable for the experiment. At all locations some field work needs to be done to level some plots before the experimental field can be constructed.

At all proposed sites crops are being currently cultivated. These need to be removed before commencing construction of the experimental field. In all cases compensation needs to be paid. Nevertheless, probably option 1 proposed by the cooperative can be made suitable for the experiment.

Also cooperation with a cooperative will be more fruitful with the cooperative then with a private farmer.

30 April Son Du (Dong Anh district) Permveg

On April 30 Soil samples were taken for physical properties and for chemical properties. For chemical properties per bed 7 samples were taken and collected separately in a plastic bag. Per field 6 bags were present in this way with soil collected per bed. Only in the laboratory samples of all six beds will be mixed and homogenized before a representative sample will be taken for the analysis on chemical properties.

A powerpoint presentation in Dutch which was presented to Paul Struik, Jacques Neeteson and Arij Everaarts on May 8 at a meeting in Wageningen on the findings of PermVeg is given in Annex 3.

3 Photos of the Permveg project



Beds for seedling raising of Chinese Kale and Welsh Onion.



Seedlings of Welsh onion



Chinese kale seedlings ready for transplanting



The experimental field before soil tillage on April 24



The experimental field before soil tillage on April 24.



The field on April 30 after soil tillage



Irrigation canal in the middle of the field



In the field a lot of empty packages of insecticides can be found.



Soil sampling for chemical properties

4 Photos of possible locations for the YRS project in Moc Chau



Land owned by farmers of the Cooperative currently cultivated with beans



Land of farmers of the cooperative looks like this. Small plots with some differences in level



In the background terraces are visible and can be a possible location for the experiment



Land owned by the Loi family and is available for the experiment



Moc Chau

Annex 1. Field trip report for Moc Chau by Hoi and Luyen

FIELDTRIP REPORT FOR MOC CHAU

From 17 to 19 of April

Team: Luyen and Hoi

General information

Climate condition:

- The climate condition is characterized by hot and dry wind in Mar and April (may last to beginning of May) that does not favour for some vegetables. Heavy rains are observed in June and July.
- Cultivated soil layer is about 40 cm (that makes rose production, in a certain extent, impossible).
- Total agricultural land is 40137 ha and there is 427.2 ha for vegetable production. Vegetables grow in Moc Chau are cabbages, tomatoes, French bean, quashes, chayote and mustard
- Total labor in agriculture is 95438 people in total 139405 population (data in 2004)
- The average temperature in the year is 18.5°C and rainfall is 1569mm, humidity is 85%
- There are some training courses for farmers. These courses are organized by PPD and Agricultural service Dep. about agronomy
- There is not seedling supplier, cooling store for vegetables yet in Moc Chau., the farmers buy the inputs from shops
- There are some greenhouses and plastic houses which belong to companies here
- Bamboo is available in Moc Chau but other materials as plastic mulch, insect cover, ect... need to buy from lowland
- The water for irrigation comes from the streams (mountains). According to the people here they can not get underground water but the quality of water is good.

Vegetable production:

- Vegetables can be grown year-round in Mocchau. However, it is mostly grown in summer season (as off-season in the lowlands). Winter vegetables are mainly produced for markets in Mocchau and adjacent provinces (Hoabinh, Thanhhoa...), thus area for winter vegetables is much smaller than that in summer season.
- Pesticides are much used. It may account for 20-30% of total production cost. Forbidden Chinese pesticides are found in the vegetable field.
- Irrigation is relied on natural water, either from small streams or bamboo water pipes established by people that bring water from upstream to the field.
- Groundwater is not yet exploited for agriculture because drilling a well is costly and just few wells can successfully have water.
- Since natural water is a single source of irrigation water, part of agricultural land is only cultivated in summer season (rice, from June to Oct.) and kept fallow in the rest of time.

Marketing condition:

- Moc chau vegetables have not yet had their own stable market share in Hanoi and other provinces such as Namdinh, Thaibinh, Ninhbinh, Quangninh etc., Thus, even in summer, Mocchau vegetables are difficultly marketed if vegetables from Dalat and China are available in the markets. One of the two largest vegetable traders in Mocchau said that he does quite sometimes throw away vegetables or fruits (tomato, French bean ...) because they can not be marketed. Specifically, he had to throw away 30 ton of tomato one time. It is estimated that vegetables exported from Mocchau to Hanoi is about several thousand tons/summer season (from Mar to Nov.)
- Taste of Mocchau vegetables are good, better than those grown in the lowlands.
- Transportation cost for vegetables from Mocchau to Hanoi (by normal truck) is 300,000 VND/ton.

Social aspects of vegetable production:

- Most of vegetable producers are Kinh people who migrate to Mocchau from the lowlands. Most of them are temporarily settled. The rest is long-term settled there.
- Temporarily settled farmers have to rent land from local people (minority ethnic) for vegetable production. The rent price is 15 million VND/ha/yr.

List of persons interviewed:

- 3 potential partners for the project had visited and interviewed. They are (1) Mr. Nguyen Van Loi who come from Melinh (Vinhphuc); (2) Mr. Mai Duc Thinh, head of Service Cooperative for Agricultural Development 19-5; and (3) Mr. Pham Ngoc Tuan, director of Tropical Flower Company. Besides, 3 traders and one farmers were interviewed.

Information of potential partners

1. Mr. Nguyen Van Loi (born in 1972; graduated from University of National Economy; Innovative and research-oriented man)

Phone No. 0912017193

<i>Location:</i>	Phienluong commune, about 20 km far from Mocchau town center.
<i>Transportation system:</i>	Good (easy access to the town and Hanoi)
<i>Start of vegetable production in Mocchau:</i>	from 2000
<i>Landholdings:</i>	5.2 ha (shared with other 3 relatives come from Melinh) (he is also having 6.4 ha for rose production in Sapa)
<i>Land ownership:</i>	Rent (contract is renewable for every 5 years)
<i>Land rent price:</i>	15 mil. VND/ha/year.
<i>Irrigation condition:</i>	Part of the field is available for gravity irrigation. The rest is irrigated by electric pump. Water source is available year-round.
<i>Extendable area for rent for vegetable production:</i>	About 10 ha (adjacent to Mr. Loi field)
<i>Agricultural production:</i>	Vegetables (kohlrabi, cabbage, wrapped heart mustard, French bean, tomato...) + flowers (gladiolus, daisy, lily...). 80% of area is grown with flowers in winter season, and the rest is for vegetables. The reverse trend is observed in summer season.
<i>Vegetable marketing:</i>	Sell vegetables to traders in Melinh (Vinhphuc) in accordance to the traders' orders or at the farmgate.
<i>Willingness to join the project:</i>	Highly. Land for the experiment is available. Willing to contribute land and some labours to the project experiment

Some pictures of Mr. Loi Farm:



The whole production area view



Mr. Loi besides his cabbage field



Mr. Loi nethouse for flower production




Gravity irrigation

2. Mr. Mai Duc Thinh (born in 1967; Head of Service Cooperative for Agricultural Development 19-5; innovative and research oriented man)

Phone No. (0912100843 – Mr. Thi, vice-head of the cooperative)

<i>Location:</i>	Nongtruong town, about 8 km far from Mocchau town center.
<i>Transportation system:</i>	Good (easy access to the town and Hanoi)
<i>Start of the cooperative:</i>	in 2000
<i>The cooperative management board:</i>	7 persons -
<i>Permanent workers:</i>	30 persons
<i>Landholdings:</i>	2 locations for agricultural production: <ul style="list-style-type: none"> • Chiengdi: 2 ha • Suoilin: 5 ha • Besides these areas, contracts with farmers for vegetable production make up 10 more ha.
<i>Land ownership:</i>	Owned by cooperative members
<i>Irrigation condition:</i>	Irrigation by electric pump. Water source is available year-round.
<i>Extendable area for rent for vegetable production:</i>	Extendable to 30 ha in Chiengdi and 20 ha in Suoilin.
<i>Agricultural production:</i>	Vegetables (cabbage, spinach, French bean, chayot...); fruits (peach, persimmon) + flowers (lily, under trial). Most of the area is for vegetables.
<i>Vegetable marketing:</i>	Sell vegetables to traders in Vannoi (as safe vegetables with normal price, some restaurants in Hanoi).
<i>Other production and marketing facilities:</i>	2 trucks (2.5 tons/truck); some nethouses; sprinkler irrigation system is available for an area.
<i>Willingness to join the project:</i>	<i>Highly. Land for the experiment is not yet available The cooperative has an area used to be for experiment, but the area maybe less than 3,000 sq.m. Willing to rent land from local farmers for the projects and become partner of the project (and contribute some labours).</i>

	
<p>Area owned by the cooperative, available for the experiment, but not large enough</p>	<p>Area that can be rented from farmers for project experiment. (upper part is cooperative field quipped with sprinkler irrigation system.</p>
	
<p>Another location that can be rented for the project experiment</p>	<p>Warehouse for vegetables and fruits</p>

3. Mr. Pham Ngoc Tuan (born in 1970; director of Tropical Flower Company; innovative and business-oriented man; can speak Russia well, read English)

Phone No. 0903444319

Email: tfc_info@fpt.vn
hoanhietdoi@gmail.com

<i>Location:</i>	About 1.5 km far from Mocchau town center.
<i>Transportation system:</i>	Under construction
<i>Start of the company:</i>	in 2005
<i>Permanent workers:</i>	15 persons
<i>Landholdings:</i>	Total land area: 9.5 ha of which 3 ha is under production, the rest is still in fallow and will be cultivated within one year as planned.
<i>Land ownership:</i>	Owned Permanent workers: 15 persons
<i>Irrigation condition:</i>	Gravity irrigation and by pump. Water source is available year-round.
<i>Agricultural production:</i>	Major crops: Lily, Tulip in winter, tomato (on-shelf production) in summer (tomato is just grown in this summer).
<i>Vegetable marketing:</i>	Sell vegetables to traders in Hanoi.
<i>Willingness to join the project:</i>	<i>Not yet. Willing to become a partner of the project with more information inputs especially those related to future marketing strategies (contribute land, even water irrigation system and some labours). Land and irrigation system for the experiment is available.</i>

Some pictures of Mr. Tuan farm:



Tomato grown in nethouse



Nethouse (for flowers)



Plastic baskets for tulip seedling production



For tulip seedling production

Annex 2. Experimental field location.

Version 3: May 11, 2007.

This short report describes the visit to Moc chau by Luyen and Herman in order to find out if suitable locations for implementing the year round supply experiment are present in the area of Moc chau.

Beforehand three locations were already visited by Luyen and a detailed report of the location owners and of their farms is already made.

On April 27 and 28 two locations were visited again to see if the proposed sites are suitable for the experiment and if the owners are cooperative. One location of the original three is no longer available since the farmer said that at this moment he is not very interested in cooperation for the experiment. He is willing to be the partner and invest together but he is more interested in marketing cooperation and not so interested in the experiment (see also the report of Hoi and Luyen)

Brief description of the possible locations

Service Cooperative for Agricultural Development 19-5

Meeting with Mr. Mai Duc Thinh

Available locations:

Option 1 is owned by farmers and need to be rented for 15 mill. VND per ha per year. The owners are Thai people (ethnic minority) and they are members of cooperative. The soil is a clay soil and easy to cultivate. It has been used for vegetable cultivation. The area is now cultivated with beans and this crop need to be removed before the experiment can start. For this compensation is asked for but at the moment unclear how much this would be. Luyen will try to find out how much this will be.

Also water is nearby and can be used for irrigation.

Figure 1 gives a schematic overview of the location. In reality the plots are not as squared as in the figure but it is possible to make two equal plots of 25 x 60 meter. The orientation of the experiment can be the same then. However there will be less space leftover for walking paths between blocks. Another issue is that perhaps the lay out of the experimental field will have another orientation than originally drawn.

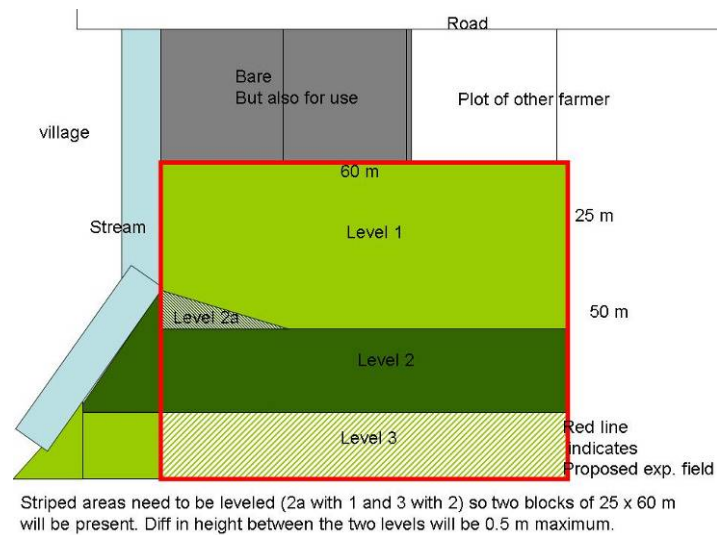


Figure 1. Schematic view of location 1.

The photos below give an impression of the land level (Figure 2 and 3). On the proposed location beans are cultivated there therefore it is hard to see the actual situation there (Figure 4).



Figure 2. Overview of land next to possible location.



Figure 3. Overview of land next to possible location, water supply is nearby.



Figure 4. Bean cultivation on the proposed location.

Option 2 is land owned by a farmer but the cooperative is looking into the possibility of buying this land and is already using it for vegetable cultivation. The plot is located at the back of the warehouse facilities. Water is quite a distance away, about 1km. At the moment zucchini and corn is grown on this location.

The plot consists of subplots of 80 m long and 10 m wide on different levels which are about 0.5 m apart. In this case the experiment can not fit in but perhaps the plots can be leveled a bit to plots of 13 m wide, so per level one replication can be present. The advantage is that the location is quite protected and that in the nearby plastic structures seedlings can be raised.

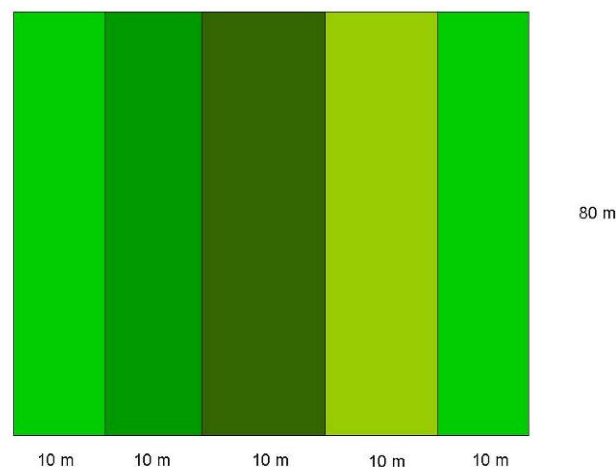


Figure 5. Schematic view of the second possible location



Figure 6. Possible location for the experiment behind the warehouse of the cooperative

Private farm owned by five family members

Mr. Nguyen Van Loi

At this farm there are two possible locations available.

The first location is across the road where the farm is. At the moment they grow corn and beans at the proposed site and some is bare soil. Soil type is good. A stream is bordering the field so water is nearby. The field is now split up in different plots, but these can be leveled to a block of 52 x 52 m. A negative aspect is that a big hole is present in the plot, which can be filled up with dirt, but still probably will give a distortion in experiment. Also before starting here the crop needs to be removed for which compensation needs to be paid. Figure 7 gives a schematic view of the proposed site where the experimental field can fit.

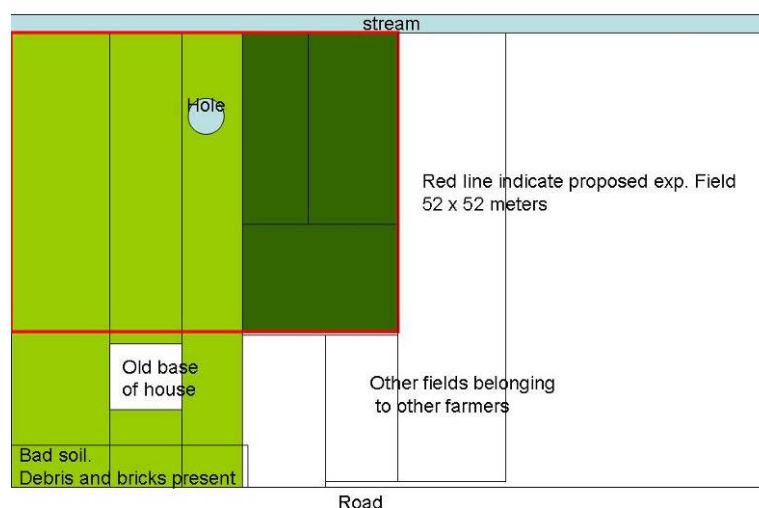


Figure 7. Schematic view of the first proposed site by the Loi farm



Figure 8. Fields that can be used for the experiment and can be leveled to one plot of 52 x 52 m.



Figure 9. The hole present in the proposed location

The second location is a bit away from the farm. Within 500 m of the site is water available for irrigation and at the moment also corn is grown there. The soil type is also good. Positive is that the experiment can fit completely here although the ground level is not really leveled but a little sloping. Less positive is the fact that people of an ethnic minority group are living nearby. This might result in loss of equipment and the water needed for irrigation might be polluted which can cause bacterial wilt in the crop.



Figure 10. Proposed second location by the Loi farm.

Recommendation:

At this moment none of the proposed sites seems immediately suitable for the experiment. At all locations some field work needs to be done to level some plots before the experimental field can be constructed.

At all proposed sites crops are being currently cultivated. These need to be removed before commencing construction of the experimental field. In all cases compensation needs to be paid. Nevertheless, probably option 1 proposed by the cooperative can be made suitable for the experiment.

Also cooperation with a cooperative will be more fruitful with the cooperative than with a private farmer.

From the interviews with the proposed partners it seems that having the cooperative as a partner will lead into a more fruitful relation and results than having Loi farm as a partner. Both have experience with vegetable cultivation.

Strong points of the cooperative compared to the Loi farm:

- 30 farmers involved
- Knowledge of vegetable cultivation
- More resources available and more reliable (labour/knowledge/funds)
- Already some experience with marketing of products to Hanoi
- Dissemination of information will be more effective
- Own advisory system
- Long term relation guarantee
- Professional

The members of cooperative are all Kinh people, ethnic minorities as Thai, Dao, Muong. The cooperative has local managers who are ethnic minorities too. So that will be very helpful to upscale the results to local farmers.

Still to find out is on what kind of base they want to cooperate. Is labour freely available to do the work necessary for the cultivation and maintenance of the field. What about inputs like fertilizer and pesticides? These aspects are not known yet but Luyen has to ask the selected partner when we decide with whom we like to cooperate.

Cooperative location option 1:

The first option proposed by the cooperative needs to be leveled to more or less two equal plots which perhaps differ in level of about 0.5 meter maximum.

Water supply and soil type are alright. Another aspect is that at the moment beans are

cultivated and they have to be removed before the work can start there. For this some kind of compensation is needed. Also the land needs to be rented.

Cooperative location option 2:

The second option by the cooperative is situated on a slope and will result in 4 different levels.

Water supply is not near nearby and some piping of 500 to 1000 meter is needed in order to lead the water from the water source to the field. Positive is that the field is quite protected, since it is situated at the back of the cooperative warehouse facilities. Also in the vicinity of the field plastic houses are present where seedlings can be raised for the experiment.

The land will soon become property of the cooperative and rent has not to be paid then in the case the experiment will be situated there.

Loi farm location 1:

The first option by Loi can be leveled and also the hole can be filled up but one can expect that the crops grown at the place where the hole was before will give different results and is therefore not recommended. Soil type and water supply at the other hand are alright. Also the location is near the farm and at the farm plastic houses are available where seedlings can be raised.

Loi farm location 2:

The location itself is very good, the experiment can fit in quite well although the ground level is a bit sloped. However, there are serious doubts about the water supply. Water is streaming nearby but it can be contaminated. Also the location is quite remote and one can not easily safeguard the equipment which will be installed on the field.

Annex 3. PermVeg presentation at Wageningen

Present: J. Neeteson, P. Struik, A. Everaarts and H. de Putter

<p>PermVeg 23 – 30 April 2007</p> <p>Herman de Putter</p>  <p>APPLIED PLANT RESEARCH WAGENINGEN</p>	<p>Lay out van het veld</p>  <p>Field layout</p> <p>APPLIED PLANT RESEARCH WAGENINGEN</p>
<p>De realiteit</p>  <p>APPLIED PLANT RESEARCH WAGENINGEN</p>	<p>De nieuwe midden greppel</p>  <p>APPLIED PLANT RESEARCH WAGENINGEN</p>
<p>Verschillende voorvruchten</p> <ul style="list-style-type: none"> ■ Binnen een blok verschillen in vegetatie door toplaag structuur ■ Verschillen door voorvrucht <ul style="list-style-type: none"> • Braak • Zoete aardappel • Mais • Bonen ■ Amaranth mislukt  <p>APPLIED PLANT RESEARCH WAGENINGEN</p>	<p>Opkweek bedden voor Chinese kale (Brassica oleracea var. Albograbra)</p>  <p>APPLIED PLANT RESEARCH WAGENINGEN</p>
<p>Opkweek van Chinese kale</p> <ul style="list-style-type: none"> ■ Goede planten ■ Wat last van aardvlo  <p>APPLIED PLANT RESEARCH WAGENINGEN</p>	<p>Welsh onion (Allium fistulosum)</p>  <ul style="list-style-type: none"> ■ Welsh Onion seedlings ■ 1 April gezaaid maar nog erg klein. ■ Optimaal 20-25 cm Nu 10-15 cm ■ Nieuwe partij kopen <p>APPLIED PLANT RESEARCH WAGENINGEN</p>

Zaaien en planten

- Verschillende hoeveelheid org. mest per gewas
- Alluvial soil: hoge zaaidichtheid volledig veld; bij mais alleen bij zaad
- Arbeidsregistratie: zoveel mogelijk per gewas toeschrijven. Maar ook rekening houden met algemene posten zoals sloot onderhoud, transport mest, composteren sojaboon.

APPLIED PLANT RESEARCH
WAGENINGEN UR

Bodem bemonstering

- Meetlint diagonaal over bed
- Per 1,30 m monster genomen
- 7 in totaal per veld



APPLIED PLANT RESEARCH
WAGENINGEN UR



Monster diepte 30 cm

Bedhoogte = 20 cm

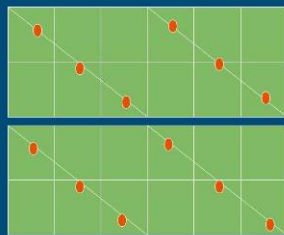
Nu: 20 cm diep bemonsterd

APPLIED PLANT RESEARCH
WAGENINGEN UR



APPLIED PLANT RESEARCH
WAGENINGEN UR

Bodem bemonstering Bulk density



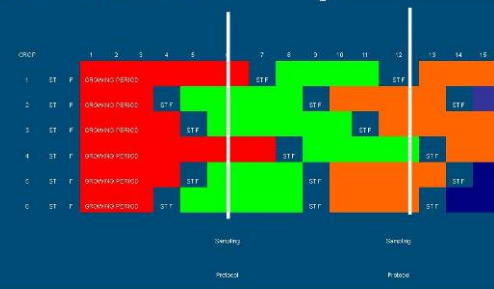
5 - 10 cm en 15 - 20 cm

APPLIED PLANT RESEARCH
WAGENINGEN UR



APPLIED PLANT RESEARCH
WAGENINGEN UR

Procedure bodembemonstering



APPLIED PLANT RESEARCH
WAGENINGEN UR

Hopelijk kan in Hanoi binnenkort goede kwaliteit groente verhandeld worden.



APPLIED PLANT RESEARCH
WAGENINGEN UR

Annex 4. Quotation for drip irrigation by Asia Irrigation

FIELD EXPERIMENTAL PROJECT - HANOI, VIETNAM

FRESH STUDIO

LIST OF MATERIAL	COUNT RY OF ORIGIN	QUANTITY	CODE	USD UNIT COST	USD TOTAL COST	EURO UNIT COST	EURO TOTAL COST
<i>PUMP</i>							
TOTAL POTENTIAL DISCHARGE: 25920 L/H (ALL STATIONS OPERATING SIMULTANEOUSLY) PUMP OPERATING PRESSURE: 2 BAR	VIETNAM	1	N/A	600.00	600.00	444.44	444.44
MISCELLANEOUS FITTINGS FOR PUMP CONNECTION INCLUDING PRESSURE GUAGES, AIR VALVE, CHECK VALVE	VIETNAM		N/A	INCLUDED	0.00		
<i>FILTER</i>							
NAANDAN 2" T SUPER FILTER, DISC ELEMENT 130 MICRON	ISRAEL	1	6200081420	115.40	104.90	85.48	77.70
<i>MAINLINE PIPE & FITTINGS UP TO CONTROL VALVES</i>							
63mm 4 ATM HDPE PIPE	ISRAEL	100 Metres (1 x 100M)	6826616100	260.00	260.00	192.59	192.59
63mm 4 ATM HDPE PIPE	ISRAEL	50 Metres (1 x 50M)	6826616050	130.00	130.00	96.30	96.30
63mm COUPLINGS	ISRAEL	5 (OPTIONAL)	TBA	7.08	35.40	5.24	26.22
63mm x 2" FEMALE ADAPTOR (FOR FILTER)	ISRAEL	2	TBA	5.28	10.56	3.91	7.82
63mm TEE	ISRAEL	1	TBA	10.70	10.70	7.93	7.93
63mm ELBOW	ISRAEL	2	TBA	7.78	15.56	5.76	11.53
63mm END CAP	ISRAEL	2	TBA	4.51	9.02	3.34	6.68
63mm x 1" SADDLE	ISRAEL	24	TBA	4.15	99.60	3.07	73.78
<i>SUB-MAIN PIPE</i>							
25mm 6 ATM LDPE PIPE	ISRAEL	200 Metres (2 x 100M)	6816612100	71.00	142.00	52.59	105.19
25mm 6 ATM LDPE PIPE	ISRAEL	50 Metres (1 x 50M)	6816612050	35.50	35.50	26.30	26.30
<i>CONTROL VALVES & FITTINGS AFTER SADDLE TAKE OFF AND UP TO END OF SUB-MAIN PIPES</i>							
50mm x 25mm REDUCING NIPPLES	ISRAEL	24	TBA	0.89	21.36	0.66	15.82
25mm FEMALE BALL VALVES	ISRAEL	24	TBA	9.17	220.08	6.79	163.02
25mm NIPPLES	ISRAEL	24	TBA	0.34	8.16	0.25	6.04
25mm TEES	ISRAEL	24	TBA	2.17	52.08	1.61	38.58
25mm END CAPS	ISRAEL	48	TBA	0.88	42.24	0.65	31.29
25mm COUPLINGS	ISRAEL	5 (OPTIONAL)	TBA	1.31	6.55	0.97	4.85

DRIPLINE & FITTINGS

17mm STAR 13 light dripline	ISRAEL	4000 m (2 x 2000m)	932290300	0.14	560.00	0.10	414.81
30cm spacing (0.35mm wall thickness) Discharge at 1 Bar pressure = 2 L/H							
16mm OD take off tube from sub-main to lateral (1 metre per lateral)	ISRAEL	300 m (3 x 100m)	6812610100	20.00	60.00	14.81	44.44
16mm Quick Start for PE pipe	ISRAEL	300 pcs	6431040400	0.13	39.00	0.10	28.89
Connector 17mm x 16mm	ISRAEL	300 pcs	6425300638	0.36	108.00	0.27	80.00
17mm in line shut off valve	ISRAEL	150 pcs	TBA	0.95	142.50	0.70	105.56
17mm End Line	ISRAEL	300 pcs	6425300655	0.37	111.00	0.27	82.22

SUMMARY

CFR HO CHI MINH CITY	3004.21	2092.01
DELIVERED ON SITE HANOI DUTY & VAT PAID AND ALSO INCLUDING ON SITE SUPERVISION AND COMMISSIONING)	5079.21	3762.38

Annex 5. Quotation for drip irrigation by Netafim

**QUOTATION**

Client	Mr. Herman de Putter		
Location	Hoa Binh		
Project No.			
System	MicroDrip 8		
Map No.	130307	UPDATE	02.05.07
Area (Ha.)	0.25		
Crop.	Vegetable		
Quotation valid until 30.May.2007			

Item	Description	quantity	Unit	Price		Total (VND)	Euro
HEAD CONTROL				VND	Euro		21,746.00
1	PUMP 1PHASE 6M3/H@25M	1	EA	1,500,000	68.98	1,500,000	68.98
2	DISC FILTER 120MESH 1.5"	1	EA	1,500,000	68.98	1,500,000	68.98
3	AIR RELEASE 1"	1	EA	250,000	11.50	250,000	11.50
4	CHECK VALVE 1.5"	1	EA	250,000	11.50	250,000	11.50
5	WATER METER 1.5"	1	EA	1,500,000	68.98	1,500,000	68.98
6	PHỤ KIỆN 15%	1				750,000	34.49
TOTAL PER GROUP						5,750,000	264.42
PIPE SYSTEM							
7	PVC PIPE 49MM	200	M	15,000	0.69	3,000,000	137.96
8	Ống PE 25MM	230	M	8,800	0.40	2,024,000	93.07
9	PHỤ KIỆN 15%	1				753,600	34.65
TOTAL PER GROUP						5,777,600	265.69
INFIELD HEADWORK							
10	P.R.V 1.5" 0.8BAR	12	EA	300,000	13.80	3,600,000	165.55
11	PVC VALVE 25MM	24	EA	35,000	1.61	840,000	38.63
12	PHỤ KIỆN 15%					666,000	30.63
TOTAL PER GROUP						5,106,000	234.80
INFIELD NETWORK							
13	MICRODRIP 8 0.3M, 1.9L/H, 250M/ROLL	3,500	M	3,500	0.16	12,250,000	563.32
14	CONNECTOR FOR MICRODRIP 8	290	EA	3,000	0.14	870,000	40.01
15	COUPLING CONN. DRIPLINE x DRIPLINE	50	EA	2,000	0.09	100,000	4.60
TOTAL PER GROUP						13,220,000	607.93
GRAND TOTAL AMOUNT				VND		29,853,600	1,372.83
VAT 5%				VND		1,492,680	68.64

FREIGHT HCMC - HANOI	VND	1,200,000	55.18
			1,496.66