

IMPROVED MARKET ENGAGEMENT FOR
SUSTAINABLE UPLAND PRODUCTION SYSTEMS
IN THE NORTH WEST HIGHLANDS OF VIETNAM
AGB/2008/002

PHOTO STORIES



Australian Government

**Australian Centre for
International Agricultural Research**



The Centre for
**COMMUNICATION
& SOCIAL CHANGE**

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PHOTO STORIES BY FARMER RESEARCHERS

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Foreword

Since 2009, researchers from NOMAFSI¹, PPRI², CASRAD³ and The University of Queensland⁴ have been working with some thirty farmers in seven villages in Lai Chau and Son La provinces in the northwest of Vietnam to find suitable methods to improve their agricultural systems while reducing erosion and preserving the natural resource base. This collaboration took place under the ACIAR funded project 'Improved Market Engagement for Sustainable Upland Production Systems in the North West Highlands of Vietnam' (AGB/2008/002). Over the three years a wide variety of field experiments were conducted in farmers' field, and with farmers' active involvement in planning, implementation, analysis and evaluation. While we more or less knew from previous research what would work scientifically to prevent erosion, increase crop production and improve value chains, this time we wanted to make sure that farmers would tell us what they think works, and what doesn't, for them.

One way of having farmers share their opinions about the research with us was through pictures. We left a compact camera with one of the farmer researchers in each village and asked them just to document whatever they thought was interesting and illustrated some sort of change, for the good or bad. Every two months we sat with them to sort their photographs and compose them into stories. A hard copy of each story was left with the farmers and often put up in their houses or a nearby kiosk, serving as a focus for discussion about the research activities within the community. The stories also taught the research team a lot about how farmers perceive the innovations and what they think are likely practices to continue beyond the project.

A selection of 33 stories out of the hundreds of stories collected over the years is presented in this booklet. We hope that they become a useful resource for farmers, extension officers, researchers and policy makers alike, and an inspiration for future research for development projects.

We would like to thank all our farmer researchers for their commitment to our collaboration, the whole research team for their enthusiasm in undertaking these extra activities, ACIAR for funding this quite unconventional project, and Rhian Deutrom of the UQ Centre for Communication and Social Change for designing the covers.

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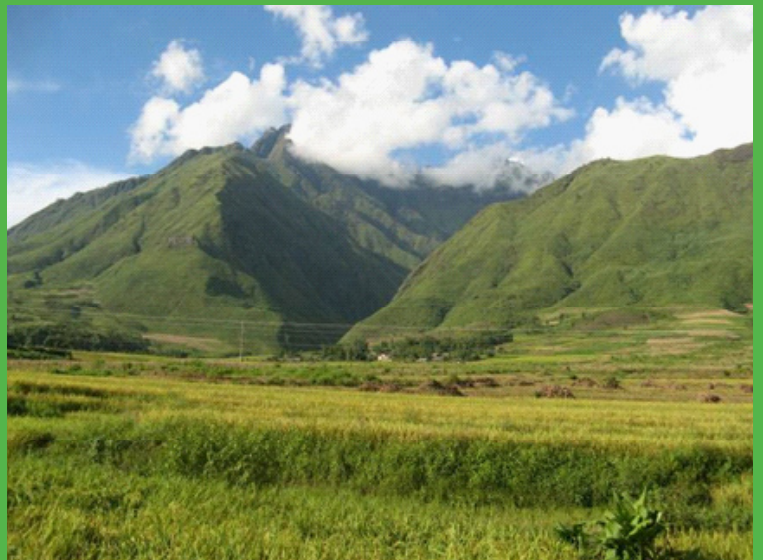
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HUNG PHONG VILLAGE



BAN BO COMMUNE



TAM DUONG DISTRICT



LAI CHAU PROVINCE

FIRST SUCCESS IN HARVESTING TWO CROPS WITHIN ONE RAINY SEASON

Location: Hung Phong, Ban Bo, Tam Ðuong

Period: March – November 2010



The first crop was sown earlier, as soon as it rained, in the beginning of the third month of the lunar calendar.

Maize variety CP999 was used because of its short growth duration to match the two crop cycles.



We happily harvested a good first crop at the end of July with a high yield of 7 ton/ha.

Soil moisture was preserved thanks to the mulch left over from the first crop.



Maize stalks were slightly burned and sprayed with pesticide before mulching. The second crop was sown before the 10th of August.

We harvested the second crop at the end of November and were extremely happy with the initial success of the second crop yielding 6.7 tons/ha.

LESSONS LEARNED FROM INTERCROPPING EXPERIMENT

Location: Hung Phong, Ban Bo, Tam Duong

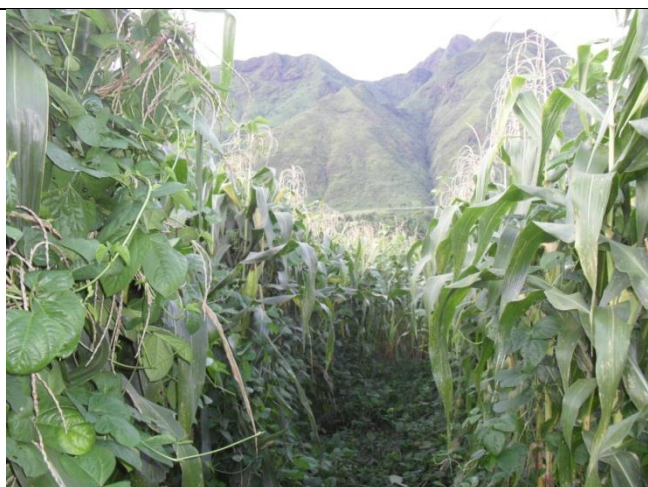
Period: March –November, 2010



Black bean was selected as the intercrop in the maize. It was sown in two strips in between the maize rows.



Due to the high moisture levels, many diseases occurred.



The black bean plants developed too fast and due to a lack of sunlight caused by high density it didn't produce any seeds.



Peanut was chosen as the intercrop for the second maize season.



We assessed that we would have a high peanut yield in our fields.



The maize yield of the second crop was high; however, we could not harvest the peanuts because they were stolen before harvest time.

INNOVATION IN CULTIVATING MAIZE

Location: Hung Phong, Ban Bo, Tam Duong

Period: March- July, 2011



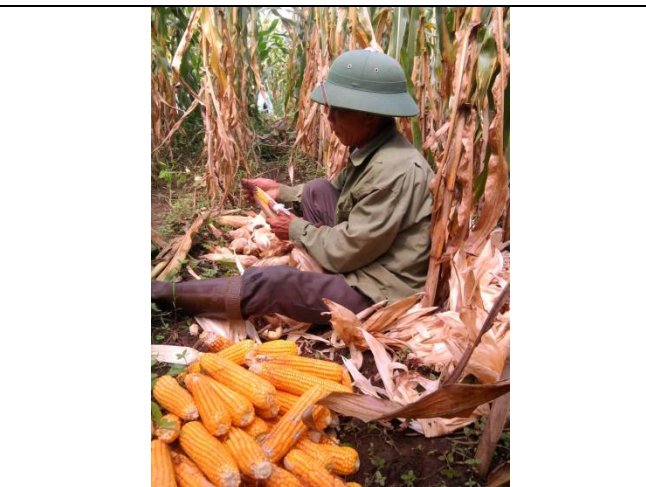
Normally, we only apply one fertilizer dressing, which does not help to optimize fertilizer efficiency.

We started to apply a new method of two fertilizer dressings.



The fertilizer was applied 5-7 cm from the plant base and covered by a thin layer of soil.

We reduced the amount of fertilizer from 500 kg/ha to 300 kg urea/ha.



The maize crop developed very well with the new method of fertilizer application.

The maize yield was very high at 7.6 tons/ha, compared to the usual yield of 5 tons/ha.

MAIZE VARIETY NK4300 AND MINIMUM TILLAGE FOR A SECOND CROP SEASON

Location: Hung Phong, Ban Bo, Tam Duong

Period: August – November, 2011



Maize variety NK4300 has short growth duration (110 days), provides 2 cobs/plant and is drought resistant.

Maize variety NK4300 developed very well in our village.








Minimum tillage was applied for soil preparation of the second crop.

We did not plough before sowing. We cultivated small trenches and applied mulch.



Maize stalks from the previous crop were used as mulch and placed in between the maize trenches.

The maize crop developed well and we harvested 6.3 ton/ha.

REPLICATE SUCCESSFUL METHODS IN FARMERS' FIELDS	
Location: Hung Phong, Ban Bo, Tam Duong	Period:: March- November, 2012
	
The local authorities and other farmers in our commune have become interested in replicating our successful method of two crops per year to 50 ha.	Thirty fellow farmers applied the new method in their own fields.
	
The free-grazing of buffaloes was banned by the local authorities to prevent damage to the second crop.	Soya bean D8 developed very well in the second crop on sloping fields.
	
We were very pleased with our yield.	Other farmers were also very impressed with the results.

EXPERIMENTING WITH A SECOND CROP ON SLOPING LAND	
Location: Hung Phong, Ban Bo, Tam Duong	Period: March- November, 2012
	
Farmers continued experimenting with the second crop on sloping land.	In addition to maize, soya bean was chosen as a crop for the second season.
	
Minimum tillage and mulching were applied.	We had to collect mulching materials from outside.
	
The maize yield was lower in the second crop.	The soya bean crop developed very nicely.

GIANG MA VILLAGE



GIANG MA COMMUNE



TAM DUONG DISTRICT



LAI CHAU PROVINCE

EXPERIMENTING WITH SUITABLE MAIZE VARIETIES

Location: Giang Ma, Tam Duong

Period: May – October, 2010



The experimental plot to test different maize varieties in our village.

The yellow Ha Giang variety developed very well and yielded 5.5 tons/ha.



The white Ha Giang variety is suitable for human consumption and marketing.

We were working closely with our field researchers.



We can preserve the seed for the coming crop.

The yellow Ha Giang variety is very suitable to our local area because it is not affected by grain borers.

GUATEMALA GRASS - A POTENTIAL FORAGE FOR CATTLE	
Location: Giang Ma, Tam Duong	Period: May- October, 2011
	
Guatemala grass was planted as a contour crop on sloping land with 5 m distance between rows.	It was planted at a depth of 5-10 cm and at an angle of 30 degrees so that the stem would be able to have more contact with the soil.
	
Very nice contours of Guatemala grass, which prevents soil erosion and serves as feed for cattle.	Maize or other crops can be planted in between the contours.
	
We can harvest Guatemala grass from 3-4 months after planting and up to 8-10 times/year.	We can feed Guatemala grass to our buffaloes and then stop free grazing.

MAIZE INTERCROPPED WITH GUATEMALA GRASS TO PREVENT SOIL EROSION	
Location: Giang Ma, Tam Duong	Period: March, 2012
	
We were transplanting Guatemala grass on contour lines on sloping land to combat soil erosion.	It is easy to propagate Guatemala grass.
	
The steeper the slope, the shorter the distance between the contours should be. If the slope level is 300, the distance between rows should be 5 m.	The seedlings are transplanting at 25-30 cm distance from each other.
	
We are very happy with growing Guatemala grass.	Fertilizer was applied for good grass development.

SOME CHALLENGES WHEN APPLYING SOIL EROSION TECHNIQUES

Location: Giang Ma, Tam Duong

Period: May- October, 2011



Mini-terracing is a good technique but yet to be applied widely due to its high labor cost.



Most of the farmers in our villages are still burning the fields, which makes mulching materials unavailable.



The meetings in Vietnamese were hard and our women could not participate much in the discussion.



Due to the drought at the beginning of the cropping season, maize and rice bean did not develop well



Red-headed beetles were occurring on the Hmong bean crop.



Hoeing our field during the dry period.

NA HA VILLAGE



NA OT COMMUNE



MAI SON DISTRICT



SON LA PROVINCE

ESTABLISHING MINI-TERRACES ON SLOPING LAND

Location: Na Ha, Na Ot, Mai Son

Period: 2010-2012



Mini-terraces were established on slopes of more than 20 degrees to minimize soil erosion.

We created the mini-terraces from the bottom-up. The width of each terrace was 40 cm.



Maize was planted in rows on the edge of each terrace.

Mini-terraces and mulching helped to prevent soil erosion greatly.



The cost of labor to create mini-terraces was high in the first year but decreased in the second year.

The yield of the first crop could be lower than usual because the top soil was lost but it would increase during the following cropping seasons.

MINIMUM TILLAGE – A POTENTIAL METHOD	
Location: Na Ha, Na Ot, Mai Son	Period: 2010-2012
	
Burning and ploughing are the reasons for soil fertility loss and soil erosion.	Minimum tillage involves no burning, no ploughing and using mulch.
	
Weed slashing one month prior to sowing.	Maize stalks and weed residues were used to mulch to the amount of 8-10 tons/ha.
	
We need to spray herbicide in order to apply minimum tillage.	In the long run, this technique will improve our soil quality and prevent soil erosion sustainably.

NO TILLAGE – A SOLUTION FOR SUSTAINABLE MAIZE CULTIVATION

Location: Na Ha, Na Ot, Mai Son

Period: 2010-2012



We did not plough or cultivate the soil but only applied dibbling.



Residues from previous crop were utilized as mulch.



A small hand hoe was used for dibbling. Holes were made at a distance of 15 cm with one hole for seed and one hole for fertilizer.



Mizin was sprayed after sowing.



We saved a lot of labor cost when applying these techniques. Researchers measured that soil loss was only 3 tons/ha compared to 38 tons/ha under normal farmer practice.



The maize crop had developed nicely.

DIFFICULTIES INVOLVED IN APPLYING THE NEW TECHNIQUES

Location: Na Ha, Na Ot, Mai Son

Period: 2010-2012



Crickets and mice caused damage to maize in mulched plots.



If we don't monitor pests and diseases in mulched plots, the crops will be destroyed.



Mini-terraces are recommended for steep slopes but farmers are hesitant because of the high labor cost.



The dibbling method will only show its effectiveness in the long term.



The majority of farmers still prefer to burn their fields because it is easy to implement.



Our fields are located far from our house and this prevents us from taking good care of our crops.

PIENG SANG VILLAGE



PHIENG LUONG COMMUNE



MOC CHAU DISTRICT



SON LA PROVINCE

INTERCROPPING LEGUMES WITH MAIZE AND APPLICATION OF MULCH	
Location: Pieng Sang, Phieng Luong, Moc Chau	Period: 2010
	
Legumes were intercropped between rows of maize that were spaced in an adjusted pattern.	Maize residues were utilized as mulch.
	
Soil run off was caught and measured.	The yield of the legumes, especially soya bean, was low due to pest and diseases damage.
	
We were harvesting the maize.	Yield for maize was high.

EVALUATION OF PEST AND DISEASE MANAGEMENT AND PUMPKIN DEVELOPMENT

Location: Pieng Sang, Phieng Luong, Moc Chau

Period: April to Maize, 2011



Aphids occurred on rapeseed plants.

Then it got on to the pumpkin crop.



We learned to use pesticide with researchers from Tay Bac University.

Farmers were doing a visual evaluation of the development of the pumpkin crop.



Pumpkin is suitable in our village and is the first crop with a very high yield.

SECOND CROP: MULCHING AND INTERCROPPING MAIZE WITH PEANUTS

Location: Pieng Sang, Phieng Luong, Moc Chau

Period: July- October, 2011



There was very little weed in the mulched plots.



Weeds occurred more in non-mulched plots.



Peanut intercropped with maize.



Assessing peanut development.



Soya bean intercropping with maize had a good yield.



Maize at dough and milking stages.

THE EFFECT OF MULCHING ON GERMINATION	
Location: Pieng Sang, Phieng Luong, Moc Chau	Period: April, 2012
	
The germination rate of pumpkin in non-mulched plots was high.	In mulched plots, the germination rate of maize was low because of mice and black cutworms damaging the seed.
	
Three seeds were sown and none of them germinated due to damage by black cutworm.	However, the pumpkin yield of the Chinese variety was still high.
	
The Japanese pumpkin yield was low due to unsuitable planting procedures.	Harvesting the pumpkin of the Chinese variety.

LA NGA VILLAGE



MUONG SANG COMMUNE





MOC CHAU DISTRICT



SON LA PROVINCE

INITIAL RESULTS FROM APPLYING INOVATIVE TECHNIQUES IN CULTIVATING MAIZE	
Location: La Nga, Muong Sang, Moc Chau	Period: 2010
	
Maize developed better in mulched plots.	Maize yield was higher when intercropped with peanut.
	
The application of mulch.	Rice bean developed very well.
	
Maize variety NK66 produced a good yield of 6.7 tons/ha.	Rice bean could improve the soil fertility and brought us extra income.







SOIL EROSION ACTIVITIES	
Location: La Nga, Muong Sang, Moc Chau	Period: from 25 th Feb to 25 th May, 2011
	
A maize field with a high degree of sloping was chosen to implement soil erosion activities.	Designing the plots for soil erosion treatments.
	
Measuring ground cover.	Measuring bulk density.
	
Carrying mulch materials to the field.	Measuring soil erosion using the pin method.






MAIZE INTERCROPPED WITH PUMPKIN AND RICE BEAN	
Location: La Nga, Muong Sang, Moc Chau	Period: from 25 th April – 25 th May, 2011
	
Experiments were conducted on a gentle slope.	Field researchers were dividing the plots.
	
Taking care of our crops .	Maize intercropped with pumpkin.
	
Rice bean continues to grow after harvesting the maize.	Maize developed very beautifully.

USING A SLASHING MACHINE TO PREPARE MULCH	
Location: La Nga, Muong Sang, Moc Chau	Period: March, 2012
	
Traditionally, farmers burn weeds and maize crop residues before sowing.	We should keep the residues and use them as mulch.
	
We should use a slashing machine to cut the maize stalks and the weeds one month prior to sowing.	Mulching material is cut into smaller pieces, which makes it easier to cultivate later.
	
Herbicide was used to spray the weeds later.	We should monitor for mice and disease occurrence when applying mulch.

MINIMUM TILLAGE	
Location: La Nga, Muong Sang, Moc Chau	Period: March, 2012
	
We did not burn nor plough before sowing. Crop residues were maintained in the fields.	Using suitable fertilizer application.
	
A small hand hoe to do dibbling.	Direct sowing into the mulch layer.
	
Two sowing holes are dug 15 cm apart with one hole for fertilizer and one hole for seeds.	Minimum tillage is a good method for improving soil quality.

CULTIVATING MAIZE ON SLOPING LAND AND MULCHING	
Location: La Nga, Muong Sang, Moc Chau	Period: April to May, 2012
	
Traditionally, farmers clear all the weeds on the fields and burn them.	However, we should keep the crop residues to mulch our field.
	
The usual distance between two rows of maize is 70 cm.	When re-spacing, the width of a big trench is 100 cm and of a small trench is 40 cm.
	
Rice bean was planted in on the big trench between two rows of maize.	Maize plant density was maintained.

INTERCROPPING RICE BEAN	
Location: La Nga, Muong Sang, Moc Chau	Period: May to June 2012
	
Maize field one week after sowing.	Black cutworms destroyed 50% of the crop when the maize had three leaves, so we had to re-sow.
	
Two weeks after sowing maize we sowed rice bean.	Rice bean seeds germinated very well.
	
In 2012, mice and other insects destroyed 30% of the maize and soya bean crops.	Maize at the flowering stage.

RAPESEED AS A SECOND CROP	
Location: La Nga, Muong Sang, Moc Chau	Period: May to June, 2012
	
Rapeseeds was sown in the autumn-winter season.	After harvesting the first crop, we grew the second crop from September to February.
	
Growing rapeseeds was very labor saving.	Rape seed price was high, ranging from VND 20,000-30,000/kg and its yield can reach up to 3.5 tons/ha.
	
Nice development of a rapeseed crop.	

TEMPERATE FRUIT MANAGEMENT



PRUNING ACTIVITIES	
Location: La Nga, Muong Sang, Moc Chau, Son La	Period: Jan- July, 2011
	
Peach tree before pruning.	Open- vase canopy shape after pruning.
	
Peach trees intercropped with peanuts.	We discussing pruning techniques with the researchers.
	
Nicely pruned peach trees.	We have high hopes for the development of our peach orchard.

TEMPERATE FRUIT ORCHARDS IN PHIENG LUONG

Location: Pieng Sang, Phieng Luong, Moc Chau,
Son La

Period: Jan – July, 2011



Plum tree development was very promising and showed we could get a high yield.

Bait traps were installed to monitor the fruit fly population.



We sprayed fruit flies together on a large scale.

Plum fruits at the ripening stage.



Our local collectors were grading the plums.

After harvesting, we started to prune and mulch our orchards.

HARVESTING PLUMS	
Location: Lung Su Phin, Ta Ngao, Sin Ho, Lai Chau	Period: Jan to May, 2012
	
Traditional harvesting methods.	Innovative harvesting methods.
	
Plums from the project's experiment.	Harvesting plums.
	
Plum size.	Fruit fly symptoms.

NEWLY ESTABLISHED ORCHARDS IN LUNG SU PHIN	
Location: Lung Su Phin, Ta Ngao, Sin Ho, Lai Chau	Period: Jan to May, 2011
	
Grafted peach tree died due to lack of care.	Researchers are working with farmers to improve the water-logging problem.
	
Peaches did not develop well because farmers sowed pumpkin too close to the young peach tree.	DCS1 peach variety developed well after two months.
	
Beetles damaged young peach trees.	Farmers are happy with the development of the orchard.

THE POTENTIAL OF TEMPERATE FRUIT CULTIVATION IN GIANG MA

Location: Giang Ma, Tam Duong, Lai Chau

Period: Jan to May, 2011



Peaches in Giang Ma after 2 years



Temperate fruit trees intercropped with pumpkins



Intercropping fruit trees with peanuts.



Intercropping fruit trees with maize.



Monitoring pests and diseases.



Leaders from the Tam Duong People's Committee committed to develop 5 ha of orchard with peach variety DCS1 in 2013.

