STRENGTHENING TIDAL LOWLAND DEVELOPMENT (STLD)
Agronomic requirements in Flooding Type A/B
(Tidal Flooding most of the year possible)

This information has been collected by the Community Organizers (CO's) of STLD in SumSel who were joined by a Dutch student in August 2007. It appeared that the STLD project needed very much this information when they started to work in KalBar with the farmers in the pilot areas of STLD. Farmers in Tidal Lowlands outside SumSel have usually still low yields of not more than 2 ton/ha. It appeared that proper water management and need for hand tractors and lack of knowledge are the main limitations for improving the yields. The lack of knowledge is the main limitation addressed in this paper together with information on proper water management during the growth of rice and palawija.

First Rotation In Type A/B: Land Preparation (When no corn is planted as a third rotation)

Removal of weeds. From end of August the fields are sprayed with herbicides of a quantity of 3-5 liter herbicides per hectare. The more weeds, the more herbicides are used. Sometimes there is up to two times spraying with an interval of 15-20 days. The herbicides are sprayed with a hand sprayer. Sun Up, Best Up, Bionasa, Basmilang,are the usual Trade Marks of the herbicides.

Hand tractor plowing. Often the dead weeds are burned by the farmers, but that requires also dry conditions in August. In other cases the farmers plow the dead weeds into the soil. The plowing will be done in middle to end of September. The soil will be quite deeply plowed and turned upside down.

Hand tractor harrowing. In the last week of October, early November the plowed fields are harrowed (garu) after the first rains. That means there are about 40 days between plowing in September and harrowing in October. This quite long period of rest to the plowed fields is essential for fermentation of the dead plowed weeds. The water management system should be operated on drainage as much as possible during this rest period. This also will promote leaching of toxic components. During harrowing the fields should have received the first rains. That might include already also flooding by tidal irrigation.
For the flooding types A/B the soil will be during harrowing much wetter than in the C/D area and the harrowing will be in quite wet conditions. See pictures
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Water Management

The water management requires the compact planting of all the farmers in one tertiary section. This will promote that farmers will do the land preparation and broadcasting with the proper water levels in the tertiary canals.
In Type A/B area the wetting of the field is mainly by tidal tidal flooding in combination with the rains. The tertiary structures are operated on supply when using the rotator and harrowing the land, but after the wet conditions during harrowing the farmers need more dry fields when starting the broadcasting of the seeds. On fields with water on the surface, the seeds will not grow. In that case the farmers have to transplant here young seedlings. When the young seedlings start to grow higher also higher water levels on the

field will be needed. In this period often the tertiary structures are on one side operated on permanent supply with movable flapgates. On the other side of the tertiary canal, the flapgate of the tertiary structure should be opened, allowing both supply and drainage depending on the tides. After flowering of the rice plants the flapgate structures should be operated on drainage only. The water management system should include an on-farm water management system (TAM) with field ditches and quaternary drains. The tertiary canals should never be dead-ended and connected to secondary canals on both ends of the tertiary canal.

Seeding (broadcasting=Tabela)

The planting/seeding is by way of broadcasting (Tabela) with about 60-70 kg seeds per hectare. The most used variety is Ciherang, but also IR 42 is used in places. The best option is to buy new fresh seeds each year and not use the old ones from the previous harvest. For the Type A/B areas the seed are pre-germinated for 1-2 days before broadcasting. An insecticide is added against orong2 and other pests during the pre-germination. About 80 ml pesticides for 60-70 kg of pre-germinated seeds is used. Trade Mark *Regent* is used for this method. The broadcasting of the pre-germinated seeds happens 2 - 7 days after the land has been harrowed. About 1-2 days after the broadcasting it is recommended that the farmer will make small field ditches with the hand shovel (cangkul) about 10m apart and about 15-20 cm deep

The seeds are carefully broadcasted over the field, so they are equally distributed. Also the first fertilizer application is done carefully.

Fertilizer applications

First Application

Farmers will apply 100 kg of Urea and 50kg of SP36 about 15-20 days after the broadcasting. In some cases also 50 kg of KCl will be applied with success on better yields. Especially when also the corn is planted as a third rotation crop.

Second Application

The second fertilizer application is 35-45 days after broadcasting. Also in this case 100 kg Urea will be applied per hectare and mixed with 50 Kg of SP36 and 50 Kg of KCl.

Pesticides

Pests may change from year to year. Normal are rats, walang sangit, kepik, ulat gerayak, wereng, ulat pengulung batang padi. Brands to be used are: Chix, Matador, Decis, Spontan, Zinc Pospit, The type is also influenced by the kind of pests. Normally about 2 cc/liter water is used. For 1 ha about 100 to 400 cc pesticides are used. That depends very much on the farmer and the severity of the problem.

Mildew problems are quite normal in the Tidal Lowlands. A common one's are neck blast and Pirycularia oryzae. Also here about 2 cc per liter water is used.

Weeds

In broadcasted fields it is quite normal that after a few years there are quite a lot of weeds that have to be removed by hand. In some cases herbicides can be used but especially with wild rice weeds it is impossible to use the herbicides. In that case farmers for one rotation will not broadcast the seeds but will use the transplanting system that will solve the problem again for a number of years.

Spraying to remove weeds and hand weeding of wild rice species

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Problem of bad growth of broadcasted seeds because of flooding

Within 21 days after broadcasted the bad growth problem should be solved by transplanting new young seedlings.

Spraying pesticides and re-planting at places with bad growing rice plants within 21 days after the broadcasting (tabela).

Harvest

The harvest of Ciherang variety is about 110-115 days after broadcasting the seeds. For IR-42 the harvest will be 120-125 days after broadcasting the seeds. Harvest should be done as much as possible mechanically when farmers own more than 1 ha. The harvest in Flooding type A/B is between 5-6 tons/ha field dry husked rice in Telang I. P8 12S. A minimum of proper water management is essential.

Manual harvesting and using a combiner that cut the ears and combines that with threshing. The more land the farmers own the more need there is for this small combiner in Tidal Lowlands

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After harvesting and threshing the ears, the husked rice must be dried. Most of the time this will happen in the sun, but it is strongly recommended to use box-driers. Previously these box-driers were using kerosene to heat the blowing air, but because of its high price and low supply policy of the government of kerosene now the use of box-driers based on the burning of rice husks is recommended.


The use of the power thresher and drying the field dry husked rice during rain-free periods. (Lot of work and use of box-drier is highly recommended instead of sun-drying.

Box-drier based on husks used as fuel.


Capacity 4 tons/day

The box-drier using husks is as efficient as the box-drier using kerosene. (No costs and there are not more husks needed than will be dried by the burning.)


A storage room in the village and a small milling unit for making milled rice (beras)

Successful farmers in flooding Type A/B Telang I , P8 12S
Information has been collected from these farmers directly by discussion.

Farmers name: Cipto#2

P 8 telang, 3 ha, 2 rice crops and on half of his land also a corn crop

August	Spray herbicide on the half he doesn't use for corn Brand = Sun Up Doses = 5 L/ha
1 October	Bajak the herbicided half he doesn't use for corn
October	Harvest the (not yet ripe) corn, after that he bajaks that field
1 November, or when rain falls	Garu
1 day later	Make little canals (20 cm deep)
1 day later	Tabela Seed = Ciherang Doses = 50 kg/ha
14 days after tabela	First fertilizers: Urea: 100 kg/ha Sp36: 50 kg/ha (mix)
45 days after tabela	Second fertilizers: Urea: 50 kg/ha Sp36: 50 kg/ha KCl: 50 kg/ha (mix)
100-110 days after tabela	Harvest: 5-6 ton/ha
1 day after harvest	Spray herbicides Brand = Gramaxone Doses = 2 L/ha
1 week after harvest	Rotary the land Add EM4 Make little canals (20 cm deep)

1 week later (after fermentation)	Tabela (same brand/doses) Brand = Ciherang Doses = 50 kg/ha
14 days after tabela	First fertilizers Urea: 100 kg/ha Sp36: 100 kg/ha (mix)
45 days after tabela	Second fertilizers Urea: 50 kg/ha Sp36: 50 kg/ha KCl: 50 kg/ha (mix)
100-110 days after tabela (somewhere in juli)	Harvest: 3-4 ton/ha
1 day after harvest	Spray herbicides Brand = Gramaxone Doses = 2 L/ha
1 week later	Cut the organic materials (3 farmers need to help him on this job, to collect the organic remnants. It will take 3-4 farmers half a day of work)
After cutting	Make canals (20 cm deep) Plant dry seed in rows: (on half of his land) Brand: Pioner Doses: 20 kg/ha
20 days after seeding	First fertilizers
45 days after seeding	Second fertilizers
90-100 days after seeding	Harvest the corn (it’s not yet ripe; babycorn)

Name of farmer: Adenan

P 8 telang, 4 ha:
2 ha close to the farm: 3 crops
2 ha far away: 1 crop

End September, early October	Harvest corn
2 days later	Spray herbicides: Brand = Sunup Doses = 1 L/ha
1 week after herbicides	First bajak
Second week of november	Second bajak
3 days later	First rotary, then garu, in one day
1 day after rotary&garu	Make little canals (10-15 cm deep)
2 days after rotary&garu	Tabela Brand = Ciherang Doses = 50 kg/ha
15-20 days after tabela	First fertilizers: Urea: 100 kg/ha Sp36: 50 kg/ha (mix)
45 days after tabela	Second fertilizers Urea: 100 kg/ha Sp36: 50 kg/ha (mix)
110 days after tabela	Harvest: 5.5 ton/ha
1 week after harvest	Spray herbicides Brand = Gramaxone Doses = 1 L/ha
4 days later	Rotary
Next 2 days	Make little canals

After canals	Tabela (same seed&doses)
15 days after tabela	Spray selective herbicides Brand = Clipper Doses = 400 mL/ha
16 days after tabela	First fertilizers
45 days after tabela	Second fertilizers
110 days after tabela	Harvest = 2,5 ton/ha (but the Kepik ruined last crop)

Name of farmer: Haji Soepir

P 8 telang, 2ha, 3crops

Middle ofOctober	Harvest corn Cut the 'stro' and burn it (not on the land)
1 week later	Bajak
1 week after bajak	Rotary & garu (in one day)
1 day after rotary&garu	Make little canals (10 cm deep) Tabela Brand = Ciherang Doses = 60 kg/ha The seed is soaked in water for one night
15 days after tabela	First fertilizers: Urea: 100 kg/ha Sp36: 50 kg/ha Kcl: 50 kg/ha (mix)
40-50 days after tabela	Second fertilizers Urea: 100 kg/ha Sp36: 50 kg/ha Kcl: 50 kg/ha (mix)
110 days after tabela	Harvest = 6.25 ton/ha
2 days after harvest	Spray herbicides Brand = Gramaxone Doses = 1 L/ha
1 week after herbicides	Rotary&garu
1 day after Rotary&garu	EM4 (with handsprayer) Doses: 1 L/ha
Next day	Make little canals
Next day	Tabela (same seed&doses)
15 days after tabela	First fertilizers Urea: 75 kg/ha Sp36: 50 kg/ha

40-45 days after tabela	Second fertilizers Urea: 100 kg/ha Sp36: 50 kg/ha
60 days after tabela	Third fertilizers Urea: 25 kg/ha Sp36: 50 kg/ha
110 days after tabela	Harvest = 3 ton/ha (but this year crop was killed by kepik)

Second Rotation in Flooding Type A/B

There is a lot of experience for the second crop in flooding type A/B in Telang I P8 The best option is a second crop of rice. But usually the yield for the second crop is lower than for the first rotation crop. It is thought that the fermentation problem of the plowed organic remnants is the main problem.

Solution problem
A major problem is the fermentation problem of the organic remnants of the first rotation crop. Too little attention is given too this problem. It will be essential that herbicides will be used: 1-2 liter Gramaxone per hectare, just one day after harvesting.) Farmers will try to burn the dead organic remnants as much as possible. Than after at least 1 week the soil will be plowed with the rotator and then harrowed and 1 day after the rotator plowing the land will be sprayed with EM4 to promote the fermentation (1 liter/Ha EM4). Then 1 week after applying the EM4 the broadcasting is performed with pre-germinated seeds like for the first rotation crop.
Another possibility is that the rice plant remnants that are sprayed with herbicides will be cut by a flail mower after 1 week in small pieces of not more than 3 cm. Then plowing and adding the EM4 will be even more efficient.

The labour problem for the second crop might be solved by using a combiner that cut and thresh the paddy.

For examples of planting the second rotation crop see the tables for the different farmers and the way they handle the second crop. In principle not much difference then with the first crop.