

**STRENGTHENING TIDAL LOWLAND DEVELOPMENT (STLD)**  
**Agronomic requirements in Flooding Type C/D**  
Tidal Flooding never 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 C/D: Land Preparation**

*Removal of weeds.* From the second week of July to early 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, Posat and Basmilang are the usual Trade Marks of the herbicides.



These pictures show the hand spraying and the dead weeds before plowing the field in September

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*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 between end of August and early September. The soil will be quite deeply plowed and turned upside down.



Hand tractor plowing (bajak) in September of weed often after burning weeds and a field on the right with plowed weeds into the soil.

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*Hand tractor harrowing.* In the last week of October the plowed fields are harrowed 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. But in Type C/D the soil will be still quite dry. In acid areas dolomite will be added just before using the harrow. (between 500 –1000 kg per hectare).



The use of the hand tractor with the harrow (garu) end of October and followed by broadcasting dry seeds in P10 2S Saleh.(right picture). Note the still quite dry field conditions. The seeds will not be harrowed under the soil surface.

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### *Water Management*

In Type C/D area the wetting of the field is caused mainly by rains, but canal structures (including for the secondary canals should be closed, or put on supply for about 2 months after the harrowing.). Often the farmers will make dams in the tertiary canals themselves and use bags filled with soil to keep water levels high for 2 months. The water on the field should not be kept on the field for more than 2 months, otherwise toxic elements will damage the rice. 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**

The planting/seeding is by way of broadcasting (Tabela called in Indonesia) with about 50-70 kg seeds per hectare. For the Type C/D areas the seed is still dry and has not be pre-wetted and germinated. This broadcasting happens 1-2 days after the land has been harrowed. About 1-2 days after the broadcasting the farmer will make small field ditches with the hand shovel (cangkul) about 10m apart and about 15-20 cm deep. Most farmers use now the Ciherang variety, but also Ciliwung and IR42 are used in places. Fresh new seeds are required each year for best effects on good yields.



Fields in Flooding Type C/D at 6 days after broadcasting and 15 days after broadcasting.

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### **Fertilizer applications**

The first application of fertilizers is 15 days after the broadcasting. With 100 kg Urea per hectare and 50 –100 kg of SP36 (The farmers that use SP36 have up to 1 ton/ha more yield).

The second fertilizer application is 40-days after broadcasting. Also in this case 100 kg Urea will be applied per hectare. When 50 kg SP36 is used 15 days after broadcasting than after 40 days again 50 kg SP36 should be applied. The last fertilizer application is after 55 days and there will be applied 50 kg Urea only. But some farmers with higher yields use for the last application instead organic hormones application with brands as Folicure with an application of 200 ml/ha. (with success). Other brands are Sprint, Gandasil or NS Saputra.

### **Pesticides**

Pests may change from year to year. Normal are rats, walang sangit, kepik, ulat gerayak, wereng, ulat penggulung 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 *Piricularia 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 pesticides and removing weeds from the growing paddy



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 combiner in Tidal Lowlands

### **Harvest**

The harvest of Ciherang variety is about 110-115 days after broadcasting the seeds. Harvest should be done as much as possible mechanically when farmers own more than 1 ha.

After harvesting and threshing the ears, the husked rice must be dried. Most of the time this will happen in the sun, but strongly recommended is the use of box-driers. Previously they were using kerosene for drying, but because of its

high price and low supply policy of the government 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 C/D Saleh P10 2S**

Information has been collected from these farmers directly by discussion.

**Farmers name: Sakim**

P 10 saleh, 1.5 ha, 1 crop

|                       |   |
|-----------------------|---|
| Juli                  | Spray herbicides<br>Brand = sunup<br>Doses = 4 L/ha   |
| August                | His field burns down, he doesn't want to, but because the other farmers do it, his field catches flames too |
| Few weeks later       | Bajak   |
| First rains (October) | Garu  |
| 1-2 days after garu   | Tabela<br>Ciherang, 60 kg/ha<br>The land is still dry, the seed is dry: abor kering                         |
| 1-2 days after tabela | Make little canals: 15-20 cm deep   |
| 15 days after tabela  | First fertilizers<br>Urea: 100 kg/ha  |
| 40 days after tabela  | Second fertilizers<br>Urea: 100 kg/ha   |
| 55 days after tabela  | Third fertilizers<br>Urea: 100 kg/ha  |
| 110 days after tabela | Harvest = 4 ton/ha  |

**Farmers name: Murodin**

P 10 saleh, 4ha, 1 crop

|                              |  |
|------------------------------|--|
| Juli                         | Spray herbicides<br>Brand = basmilang<br>Doses = 4 L/ha                      |
| Late August                  | Bajak (no burning)   |
| First rain, early<br>October | Garu   |
| Next day                     | Tabela<br>Ciherang, 50 kg/ha, Tabur kering<br>Make little canals             |
| 15 days after tabela         | First fertilizers:<br>Urea: 100 kg/ha<br>Sp36: 100 kg/ha<br>(no mix)         |
| 30-40 days after<br>tabela   | Second fertilizers:<br>Urea: 100 kg/ha                                       |
| 55 days after tabela         | Use of hormones<br>brand = folicur<br>doses = 200 mL/ha<br>with hand sprayer |
| 110 days after tabela        | Harvest = 5-6 ton/ha   |

**Farmers name: Kasmuri**

P 10 saleh, 1 ha, 1 crop

|  |   |
|--|---|
| Second week of Juli                    | Spray herbicides<br>Brand = sunup<br>Doses = 4 L/ha             |
| Second week of August                  | Burns land  |
| First week of September                | Bajak   |
| When rain falls, first week of October | Garu  |
| Next day                               | Tabela<br>Ciherang, 60 kg/ha, tabur kering                      |
| 30 days after tabela                   | First fertilizers<br>Urea: 100 kg/ha<br>Sp36: 50 kg/ha<br>(mix) |
| 55 days after tabela                   | Second fertilizers<br>Urea: 100 kg/ha<br>Sp36: 50 kg/ha         |
| 65 days after tabela                   | Third fertilizers<br>Urea: 50 kg/ha                             |
| 110-115 days after tabela              | Harvest: 5 ton/ha   |

## Second Rotation in Flooding Type C/D

In principle should the second rotation be a palawija crop (maize or soybean etc.) because the conditions are most of the time too dry for a rice crop. Trials concluded that however the yields of the maize remain too low for the second crop. The main reason is that farmers make insufficient ditches too drain the land when there is rain. An on-farm water management system is required with at least 50 cm deep ditches every 8-10 m. That requires too much work after harvesting the rice.

### *Solution problem*

The only place where farmers grow successful maize in Flooding Type C/D is in Karang Agung Tengah. They have made the ditches each 8 m and 50 cm deep and grow three times a palawija crop per year. Some farmers include in rice crop during the wet season and grow maize as a second crop. Rotation of the crops is essential to avoid excessive pests. Another possibility is to include soybean in the rotation. They keep the 50 cm deep ditches 8 m apart also for the wet season rice crop but close them with a small soil dam in this period. Plowing with hand tractor is still possible on these fields with ditches 8m apart.



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