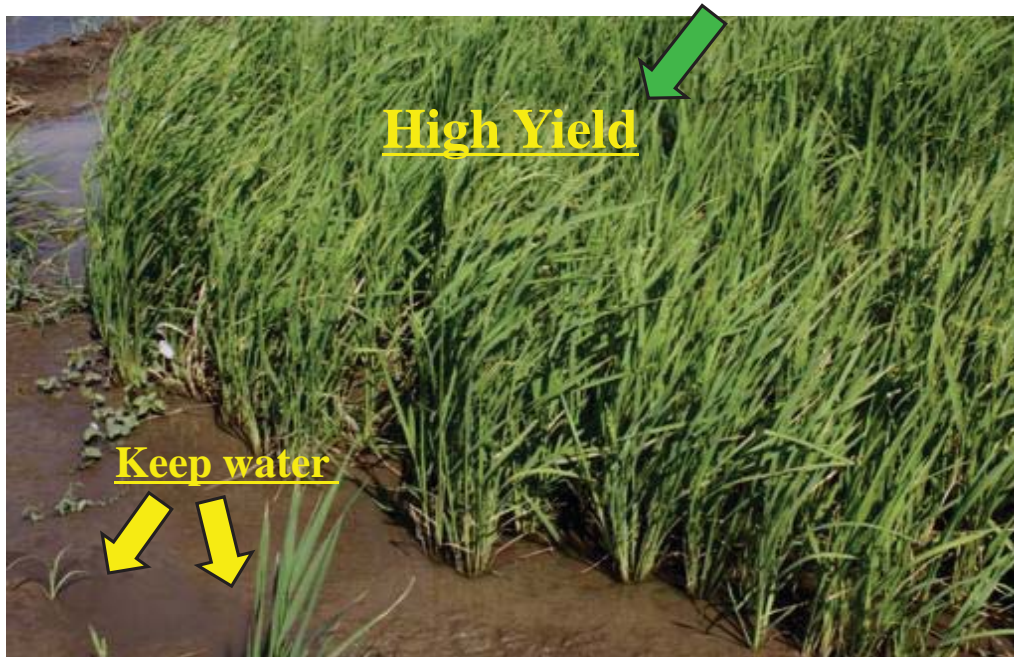


## ⑥ Appropriate Irrigation



**From panicle initiation stage (50 days after sowing) to heading (flowering) stage, rice requires much water compared with other stage. Irrigate enough water and keep it in the field !**

**Appropriate Irrigation → Enough water**



## Water management (Heading stage)



**No water !**



**Enough water !**

**Field must be irrigated uniformly, especially at this stage !**



### **Please keep in your mind on water management;**

- **Insufficient water causes poor growth of rice.**
- **Submerged water after sowing impedes germination and emergence of seedling of rice due to lack of oxygen.**
- **Excessive irrigation water at early stage before panicle initiation possibly retards root development of rice.**
- **After rice starts to form panicle, it requires more water to have steady panicle growth compared with early stage. In particular, sufficient water is indispensable for rice at heading and flowering stage. In case irrigation water is not provided sufficiently at these stages, shortage of water causes empty or immature grains.**
- **In Sudan being high temperature, deficiency of water at/after panicle initiation stage, especially heading and flowering stage, causes empty grains at higher rate that results in low yield.**

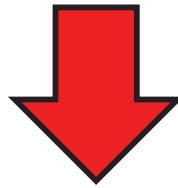




**Just after sowing**

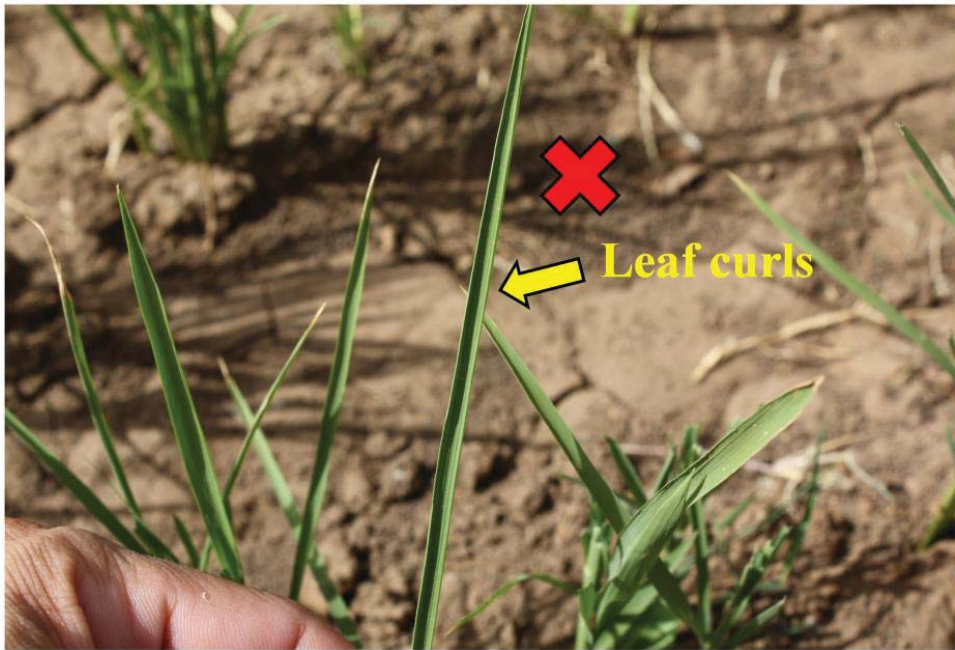


**Please reduce the amount of water !  
Just after sowing, no need to keep a lot of water.  
Excess stagnant water impedes germination  
and seedling emergence due to lack of oxygen !**

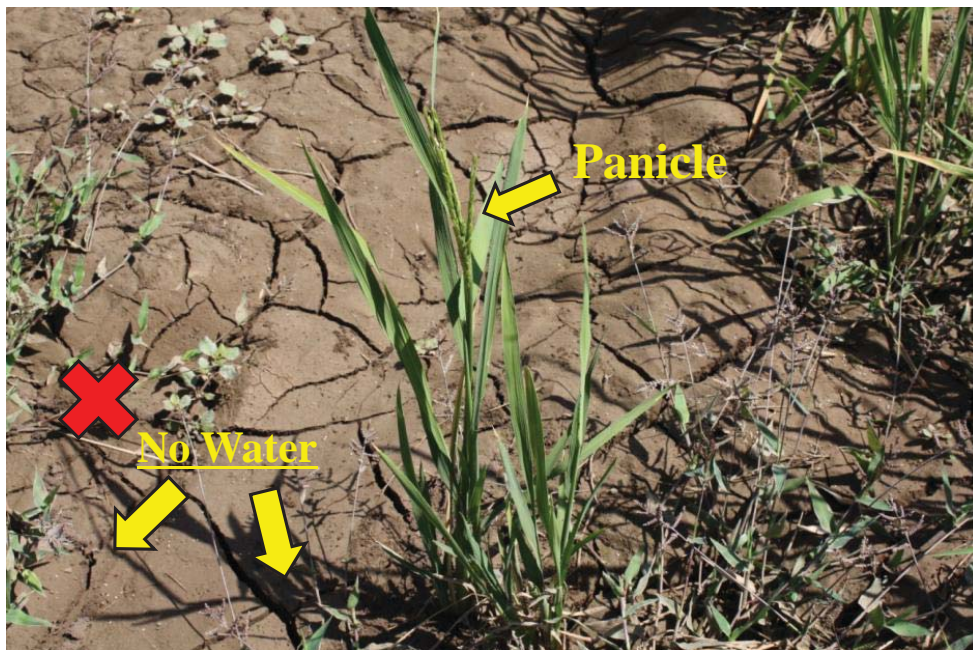


**Good seed emergence !**

## Rice requires water (1)



## Rice requires water (2)







**White Head**

**Why ?**



**Sterile panicle (grains)**

**Why ?**



**1) White head caused by**

**① Lack of water**

**② Damage by insects such as stem borers**



**(By Mr.Tsuboi)**

**2) Sterile panicle (grains) caused by**

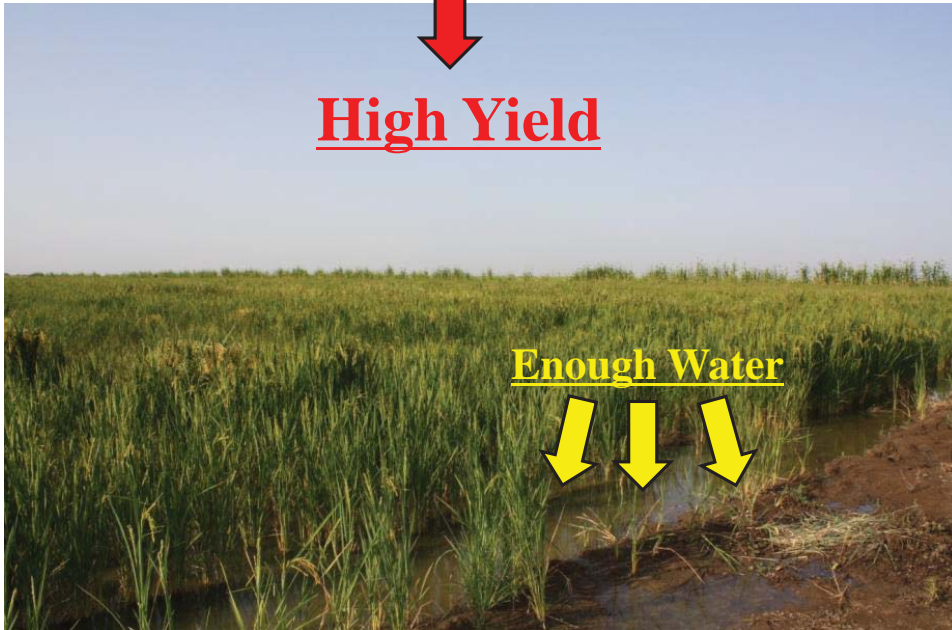
**Lack of water under high temperature condition  
from panicle initiation to heading( flowering)**



**Enough water from PI to Heading stage**



**High Yield**



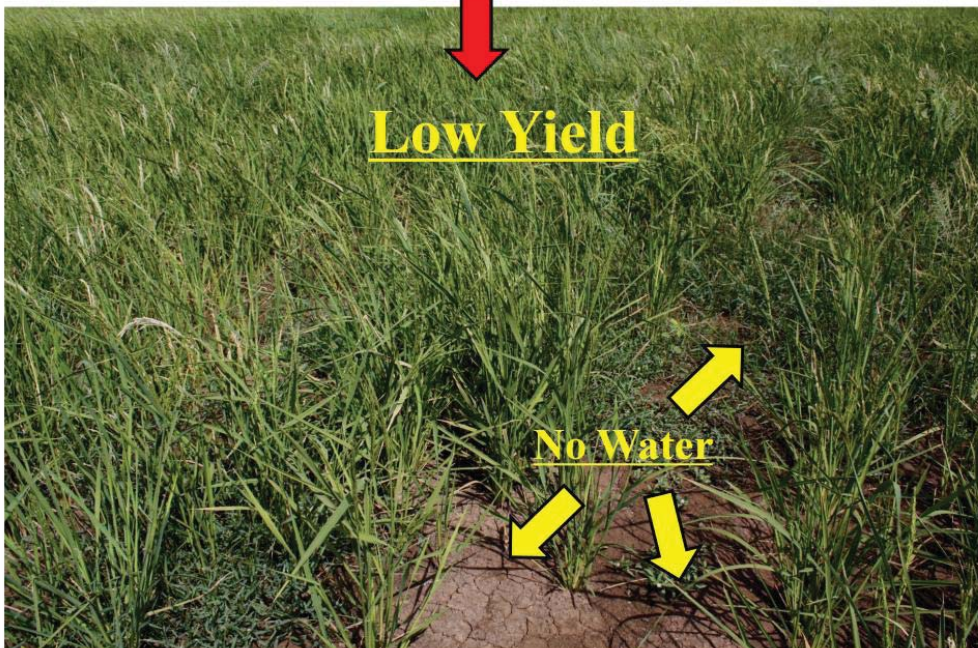
**Enough Water**



**Not enough water from PI to Heading stage**



**Low Yield**



**No Water**





**Only daily practical effort can produce good yield !**



**Re-sowing**



**Weeding**



**Weeding**



**Weeding**



**Weeding**



**Water management**



**Water management**



**Cleaning the field**

**You can realize high yield**  
**by implementing each operation properly.**

- ① Using Pure Seed
- ② Good Land Leveling
- ③ Proper Sowing Operation
- ④ Sowing at Optimum Time
- ⑤ Effective Weed Control
- ⑥ Appropriate Irrigation
- ⑦ Harvesting at Proper Time



**Daily practical management**



**Yield : 4.0t/ha (1.7t/fed) !**





## ⑦ Harvesting at Proper Time



**Harvesting at proper time is important to obtain head rice, not broken rice. Harvest must be started before moisture content of rice becomes less than 17% to prevent over drying.**



## Harvesting time



**Too late !**

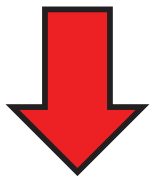


**Optimum time !**



## Rice Milling Machine

**After milling rice,  
how about rice ?**



**If you do not harvest at optimum time**



**A lot of broken rice  
due to late harvest  
(= over drying)**



**A lot of head rice  
because of good  
timing harvest**





# **Additional information**

## Rice in the world and the classification (1)

Rice planted area in the world: 157,500,000 ha (2012, Prof. ITO, Kyushu Univ.)

Rice production in the world: 720,000,000 t (2012, FAOSTAT)

Rice is eaten by half of the world population as staple food like Japan.

— *Oryza sativa* L. Indica → IR-64, Tox, WITA, etc.  
 (Asia Rice) Japonica → Koshihikari, Nihonbare, etc.  
 Javanica → Moroberekan, Lac etc.  
 (= tropical japonica)

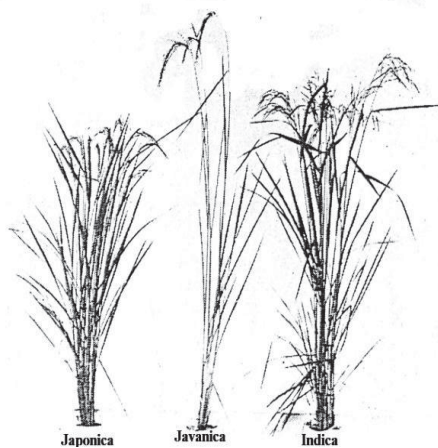
— *Oryza glaberrima* Steud.  
 (Africa Rice)  
 — *Oryza rufipogon* Griff.  
 — *Oryza nivara* Sharma et Shastry  
 — *Oryza longistaminata* A. Chev et Roehr.

↓  
 about 20 wild rice in the world.

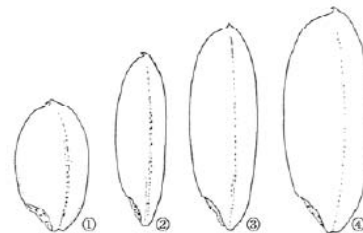
Progenitor of *Oryza sativa* L. is *O. rufipogon*

Progenitor of *Oryza glaberrima* Steud is *O. barthii*

## Rice in the world and the classification (2)



Japonica Javanica Indica



① : Japonica  
 ②③ : Indica  
 ④ : Javanica

### Classification of rice by amylose content

Non-glutinous rice: 10 to 25 % amylose + 90 to 75 % amylopectin

Glutinous rice: 100% amylopectin



## What is NERICA ?

NERICA = New Rice for Africa

NERICA is the product of interspecific hybridization between the cultivated rice species of Africa and Asia.  
( *O. Sativa* L. × *O. glaberrima* Steud.)

## Development of NERICA

♀ Asian rice



*O. sativa* L.  
WAB 56-104

×

♂ African rice



*O. glaberrima* Steud.  
CG 14

→



NERICA





