Crop Research in Lao PDR

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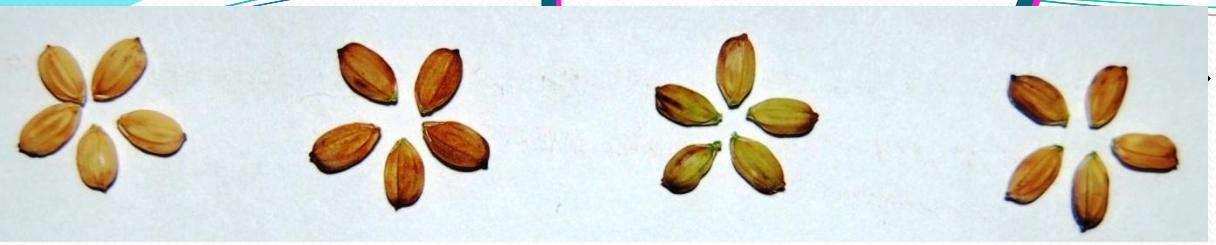
ARC Responsibility



Crops Research

- Rice
- Maize
- Legume Grain
- Tuber Crop

❖ Training

- Provincial staff
- Students

❖ Cooperation

- IRRI
- RIHN, JICAS- Japan
- -ACIAR
- Lao -Thailand
- Lao-Vietnam
- Lao-Chine(YAAS)
- Lao-Singapore
- Lao-Korea (AFACI)

❖Seed multiplication

- ➢Breeder seed
- ➢Foundation seed
- ➢Registered seed (R2)

Introduction

- **Rice is the staple for about half of the world's population**
- **Increasing of population, but planting areas are decreased**
- **Government policy:**
  - **In 2015: 4.2 mill. tons**
  - **In 2020: not less 6 mill. Tons (MAF, 2012)**
- **Market needed (quality and quantity)**

Introduction (cont.)

- **Production problem**
  - **Soil not fertile**
  - **Climate change**
    - **Drought and flood**
    - **Disease and pests**

Research components

- **Short term**
  - **observation and evaluate local varieties and introduce direct to farmers use**
  - **Introduce varieties/fixed lines from other research centre in country and abroad**
- **Long term: develop new varieties**
  - **Crossing**
  - **Select segregated and fixed from research centre in country and abroad**

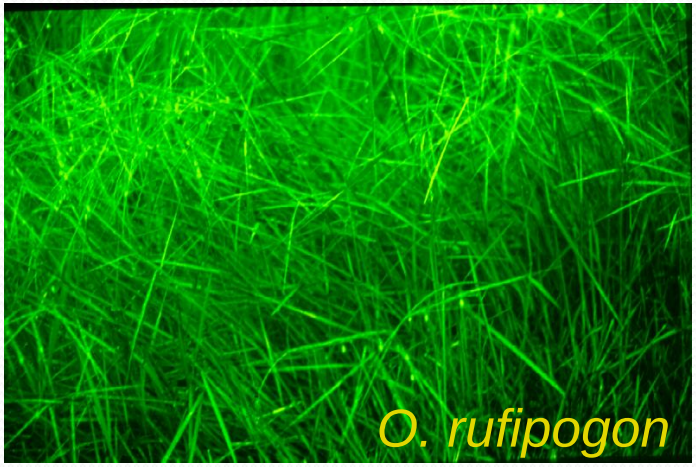
Rice Research Objective

- **High yielding**
- **Resistance to diseases and pests**
- **Wide adaption**
- **Good quality**

Conservation of Lao Rice collection at Lao National Gene bank, 2005

Endosperm	Lowland	Upland	Total	%
Glutinous	5,157	6,250	11,407	85
Non-glutinous	782	1,162	1,944	15
Total	5,938	7,412	13,351	
%	44.5	55.5		

5 Wild Rice Species of *Oryza* in The Lao PDR



Characterization

Evaluation for Utilization

	Direct use in Rice Production
Non-Glutinous	**Chao Deng1, Chao Deng 2, Chao Dok Dou, Chao Kam hom LG 5448, Chao Kam hom LG 3302, Chao kam LG 8140…**
Glutinous	**Phea Khao, Phea Deng ,Kai Noy Leuang, Hom Nang Nouan, Hom sa Ngiem, Kam Niew hom LG13259, Kam niew hom LG 175,…..** **Khao Nok, Lep meu&Mak hin soung, Khao Vieng..**

“Kam Niew Hom”

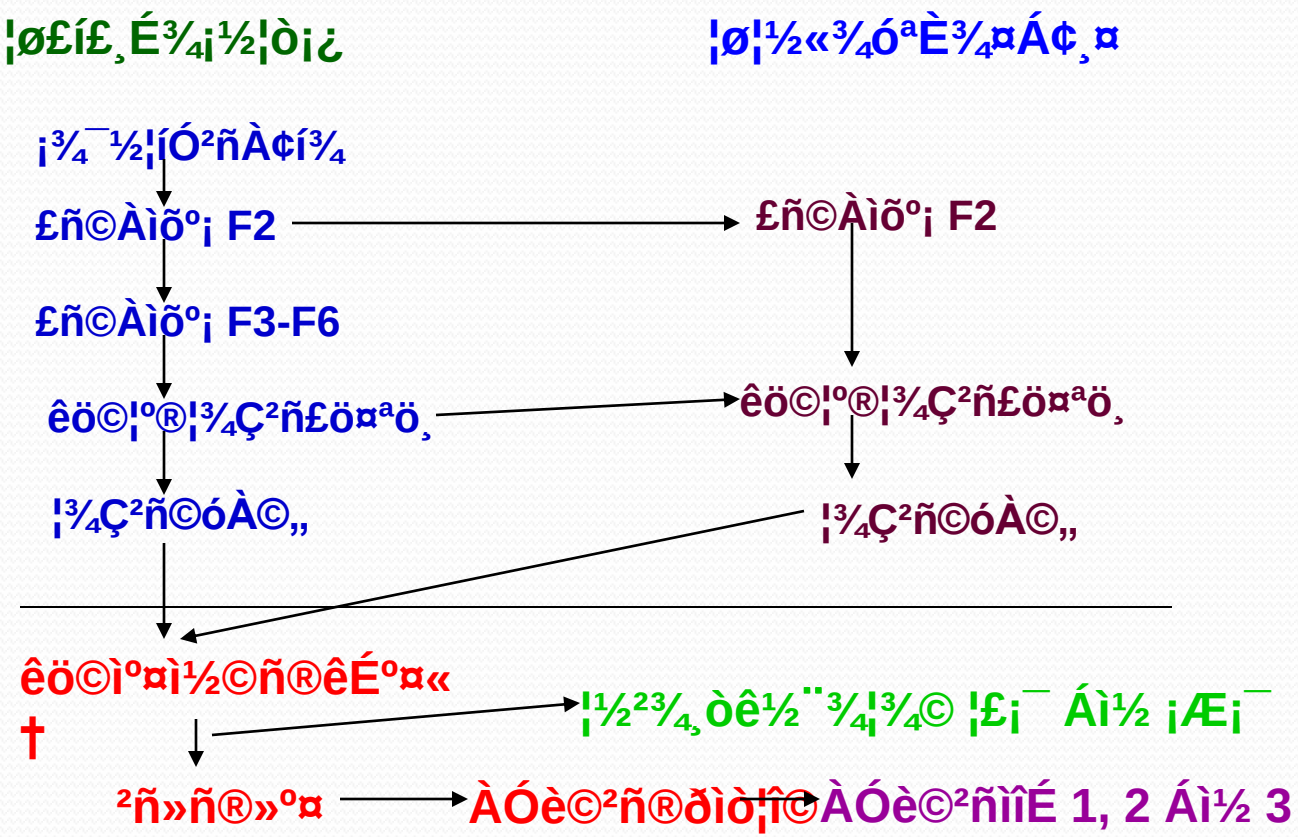
Black Rice Variety

Foundation Seed

Kainoi Leuang, Scentered Rice, Origin from Huaphanh Province

Rice Breeding Activities

1. Crossed & F2, F3-F6 Selection
2. Evaluation of Fixed Lines Developed By RCCR C and from IRRI
3. Develop Aromatic Rice in Collaboration with Kaset sat Kampheng sene, Thailand and IRRI
4. Farmer Participatory in Varietal Selection
5. Seed Multiplication of Promising Lines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Year	use in Breeding program(>60 crosses)	Special trait
1997	Meung Nga, Mak Hing, I Khao, Mak Yom	Good eating quality, Good for sandy soil (TDK 12 &TDK 36-)
1999	Do Youan,	Quality
2000	Kam LG7712, kam LG7697,Kam LG9912	Quality
2001	Hom Thong	Quality
2004	Hom lai, meuang nga, chao deng, chao america, Ang Do, Kam 14, chao, hom thong,hom 1, hom keo, I Khao,	Resistant to call mitge, blast ,Acide soil, Good for sandy soil, Drought tolerant,
2005	Chao Deng1,Chao Deng 2, Homsangiem,Hom Ken Chan, Khao Pong,	Drought tolerant, eating quality
2006	Hang Yi, Meuang Nga,Phea Khao,Phea Deng,Kai Noy Leuang, Hom Nang Nouan,	Good eating quality and resistance to god might
2007	Hom sa Ngiem, Hom Phea, Hom Khaw, Hom Vieng, Hom Deng & Hom Lai	Quality
2008	Hom Peuak Dam, Hom Han Chan,	Quality
2009	Kam: LG6740,LG6828,LG5649,LG 5925, LG13259, LG8140, Mak Hing,Ta Kied, I Kao, Chao Deng2	Aroma and good eating quality, drought tolerant,
2010	Kam BR11,Kam LG5548 & Kam LG2940	Drought tolerant, eating quality

Achievement 1991-2011

Improved varieties were released :

1993: TDK1, TDK2
1994: PNG1
1995: PNG2
1997: TDK3
1998: TDK4, TSN1, NTN1
2000: TDK5
2002: TDK6, TDK7*, PNG3
2003: TDK8, TDK9*, TDK10, PNG5*
2009: TDK11*, TSN5*, TSN6*, TSN7* and Homesavan*

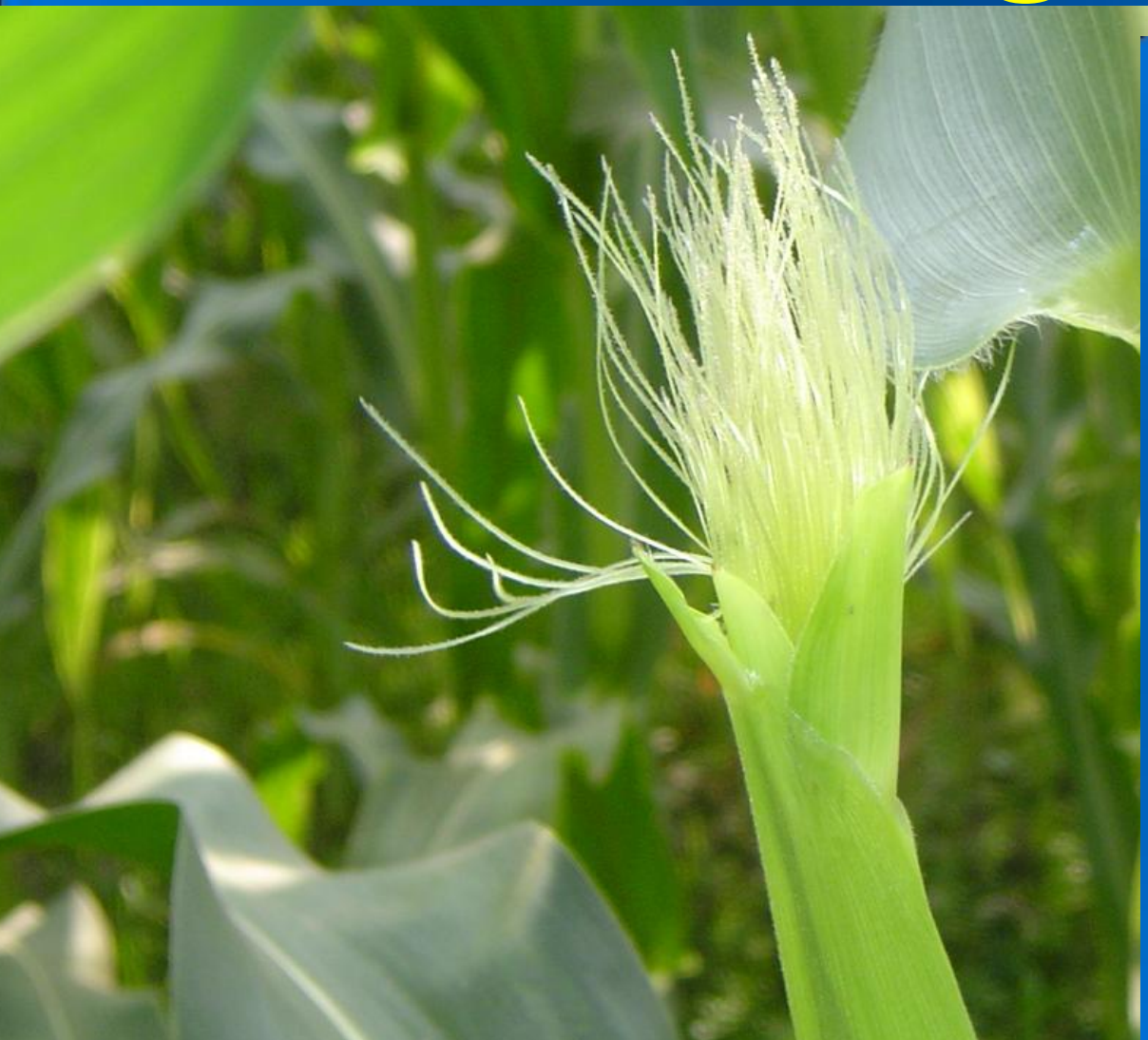
Breeder Seed Multiplication of Released Variety

Foundation Seed Multiplication

TDK1-Sub1, in collaboration with University of California and IRRI

Rice seed storage at ARC

Maize Breeding Activities



1. **Maize for Consumption:**
   - **Germplasm Collection (136 Acc.)**
   - **Develop OPV**
2. **Maize for Feeding:**
   - **Germplasm Collection**
   - **Develop OPV**
   - **Develop Inbreed Line**

Maize Research Step

1. Introduce Maize
2. Selection Activities
3. Develop Lao's Hybrid Maize :
   - Develop inbred lines
   - Select promising crosses
   - On Station and on farm testing
   - Demonstration of Promising crosses in the farmer field
4. Maintaining of Parent material
5. Seed production and Distribution

Achievement 1991-2011

1. Developed and conserving 362 lines
2. Selected 33 of inbred lines.(table 1)
3. Selected 12 Promising crosses(table 2)
4. Released one variety VTE 450

Table1: List of inbred lines

Ent.	Line name	Ent.	Line name
1	NKSV1-2(1-2)	18	VL5-2-1
2	NKSV3-3	19	LVN99-1-2
3	NKS5-4-2	20	HQ2000-3-1-1
4	VL5-3-3	21	YA748291-1-2-2
5	LVN99-1-2	22	NKSV3-3
6	LVN99-1-4	23	SK2-2-1
7	VN8960-4-3-4	24	NKSV-5-4-2
8	VT131	25	VN8960-5-1
9	VN8960-2-5-1	26	YA821922-1-1-4
10	SK2-1-3-1	27	VL10-1-2
11	. SK2-1-D_{10-11}	28	VT130-1-2-D10-11
13	VT094-1-2	29	KT3
14	LVN22-2-3	30	LVN24-1-2
15	VT130-1-2D_{10-11}	31	HQ2000-3-1-1 D10-11
16	LVN24-1-2	32	VT135-3-2
17	VT094-2-1-1	33	VT154-2-1(1)

Table 2: Selected 12 Promising crosses from 126 crosses WS 2012

Ent.No.	Crosses
1	NKSV1-2(1-2) x VL5-2-1
2	NKSV3-3 x LVN99-1-2
3	NKS5-4-2 x HQ2000-3-1-1
4	VL5-3-3 x YA748291-1-2-2
5	LVN99-1-4 x SK2-2-1
6	LVN99-1-2 x NKSV3-3
7	VN8960-4-3-4 x NKSV-5-4-2
8	VT131 x VN8960-5-1
9	VT094-1-2 x LVN24-1-2
10	VT130-1-2D_{10-11} x VT135-3-2
11	LVN24-1-2 x VT154-2-1(1)
12	♀VTE 450 x VT094-2-1-1

Demonstration plot at Vientiane province WS2010

1st Released Variety of hybrid maize “ VTE 450”

Legume Grain

- **Develop Lao germplasm by collecting from different sources (in country, Thailand, Vietnam, China, Taiwan, Indonesia..) (88 Acc.)**
- **Evaluation of introduced lines from Thailand, Vietnam, China, Indonesia , Japan and Taiwan**
- **Hybridization (Soybean)**

Selected varieties

- **Soybean : S Ch 5 and CM 60 from Thailand**

  DT 84 and DT 12 from Vietnam

Develop two new varieties of Soybean at ARC

(S-ARC 1)

S-ARC 2

Selected varieties

Red bean from Japan

Cassava

Cassava:

- **Collection (43 Acc)**
- **Evaluation of introduced variety from Thailand and Vietnam and in the 2005 were introduced 320 lines from Colombia and selected 6 promising lines**
- **Inter-crop study**


R 72


KU 50


NEP


NARC 61

Sweet Potatoes

- **Germplasm Collection 22 , Characterization and Evaluation for Use (16Varieties)**

Diversity on leaves and roots

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Thank you for attention