



Dissemination of Hybrid Rice Seed Production Technology

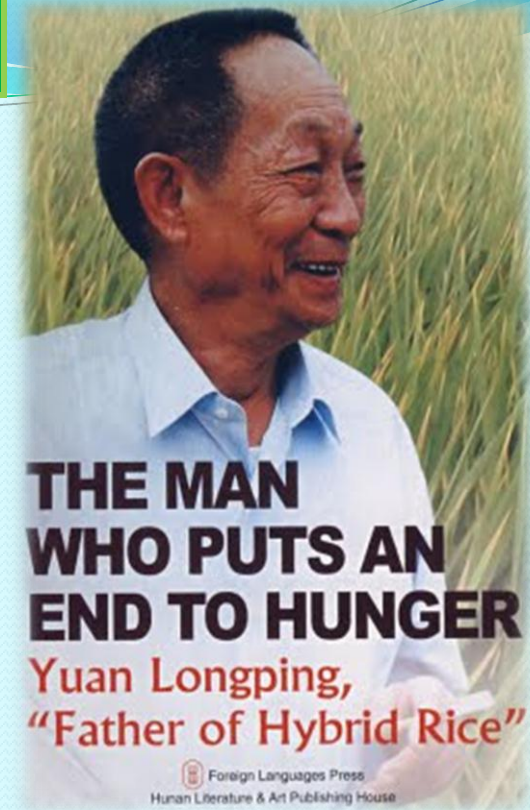
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Hybrid rice history & current activities in Myanmar

Hybrid rice production in China

- Hybrid rice production was conducted for domestic food security due to insufficient cultivated areas, high population
- Hybrid rice cultivation was started in 1974, from 1976 to 1999 total area of hybrid rice cultivation was (233) million hectares and produced more than (350) million tons
- The news of Hybrid rice scientist Professor Yuan Longping tested Super Hybrid rice DH2525 (Y two superior No.2) in Hunan province, China produced 13.9 tons/hectare (280 baskets/acre) published in 20-9-2011 China Daily Newspaper.



HYBRID RICE	
INDIA	CHINA
Acreage	Acreage
1.4 million ha (3%)	18.6 million ha (60%)
52%	90%
irrigated area	irrigated area
1994	1976
1st hybrid released	1st hybrid released

Refer: - <http://www.hybridriceindia.org.china.htm>
IRRI Annual Report (2009)



- It is aimed to breed super hybrid rice varieties that can yield 15 tons/ha (300 basket per acres) in year 2020
- China hybrid rice cultivated areas is 18 millions hacter whilst world hybrid rice cultivated area is 20 million hacters)
- **The main theme of successful story of hybrid rice in China is Political Will**

(Systematically research and development, Enhancing Private sectors role, demonstration, practicing and provide awards

Refer: - <http://www.hybridriceindia.org.china.htm>
IRRI Annual Report (2009)

Hybrid Rice Production in Asian countries

Vietnam- In 1991, hybrid rice cultivated areas was 100 ha, in 2001 it was extended to 480000 ha. China export volume of hybrid rice is 7 millions tons per year

Indonesia- In 2003, hybrid rice cultivated areas was 0.2 million ha, in 2007 it was extended to 0.3 million ha.

Philippines- In 2002, hybrid rice cultivated areas was 135 ha, in 2007 it was extended to 0.3 million ha.

Sri Lanka- In 1994, hybrid rice research experiments to in 2008

cultivated areas was extended to 160 ha.

India- Hybrid rice cultivation was started in 1989. And total rice cultivated area was 45 million ha, out of this hybrid rice cultivated areas was 0.2 million ha, Hybrid seed production is 4000 tons per year, 95% of it produced by private sectors

Korea, Russia, Japan, Iran and Bangladesh countries produce hybrid rice seeds production as well.



International hybrid rice development

- American, Egypt and North Africa countries (China Investments)
- In Asian Countries such as China, India, Thailand, Vietnam, Indonesia, Cambodia, Philippines, Laos, Sri Lanka, Pakistan, Bangladesh are drastically developing hybrid seed production and technology



Hybrid seed production in China



Hybrid seed production in America



Pollination by human in China

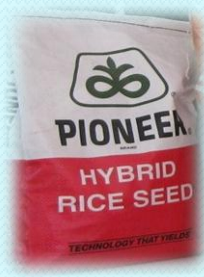


Pollination by Helicopter

- Currently, Thailand produces 150 basket/ acre quality hybrid rice “PTT 06001H” and attempt to export more than 15% in 2015
- Hybrid Rice Development Consortium (HRDC) was organized by International Rice Research Institute (IRRI)
- Myanmar is one of the member countries of HRDC



Successful production and marketable Hybrid rice and high yielding varieties in farmers communities , Philippines



Mobile
Internet
Bus in
Philippines



Mobile Internet Bus

equipped with 10 notebook computers with Wi-Fi,
TV, VCD, LCD, public address system
and 2-way VHF speakers.

Myanmar and Hybrid rice production

- Myanmar and hybrid rice production are familiar for 2 decades
- From 2003 to upto now, farmers from Northern Shan state grow hybrid rice successfully
- **Conducting** the seed industry development for hybrid rice
- At present, new government laid down the guide line to produce 100 acres hybrid seed production in each region



10 days after seeding (Shwe Taung Farm)



10 days after seeding (Yezin Agricultural

Hybrid rice seed production technology

Objectives;

- (a) To changing Hybrid rice varieties, enhancing yield per acres and increasing farmers' income
- (b) To distribute hybrid rice seed production technology to farmers and Agriculture production companies and to support for the **formation of** the private seed production companies.
- (c) To provide access to purchase Hybrid seed in cheap price by farmers by extension of the hybrid seed production in Myanmar
- (d) To extend hybrid rice growing areas, for getting the domestic food security and increase foreign income by exporting.



Advantages of Hybrid rice seed production

development

By the development of hybrid rice seed production

- save the seed per acre, increase yield 2-3 times, farmers get cost-effective
- Increased employment opportunities
- Rise of technology based new professional jobs
- Can earn foreign income by hybrid rice production through domestic food surplus, and export to other countries
- Increase involvement and investment by private sector
- Development of hybrid rice, its related technologies and agri-business
- **Emerging new era of Myanmar Rice Sector**



- ❖ Hybrid rice can overcome agricultural resources limitation
- ❖ Hybrid rice production system development is historical obligations
- ❖ Investment in Hybrid rice production system development provides high return of investment.
- ❖ if hybrid rice production technologies can be distributed to the farmers' hands, it will be easy and quick adoptable agricultural production methods.





- Climate change, affect food security
- Myanma Rice Production was affected by Cyclone Nargis in 2008
- In 2010, Giri Cyclone affected food security
- Hybrid rice can support to emergency rice



Hybrid Seed Production from 2011-2016

No	Year	Seed Production Area (Acre)				Yield (Kg)			
		Department	Farmers	Companies	Total	Department	Farmers	Companies	Total
1	2011-2012	498		526	1024	335943		326204	662147
	Wet Season	180			180	103164			103164
	Dry Season	318		526	844	232779		326204	558983
2	2012-2013	1206		631	1873	887131		424662	1311793
	Wet Season	595		45	640	422189		4719	426908
	Dry Season	611		586	1197	464942		419943	884885
3	2013-2014	762		550	1312	538936		438709	977645
	Wet Season	532		20	552	410985		18709	429694
	Dry Season	230		530	760	127951		420000	547951
4	2014-2015	367		1787	2154	178473		1576670	1755143
	Wet Season	230		660.0	890	104156		484050	588206
	Dry Season	137		1126.5	1263.5	74316.73		1092620	1166936.73
5	2015-2016	100	40	2160	2290	22550	26500	897442	946492
	Wet Season	41	40	974.5	1056	22550	26500	897442	946492
	Dry Season (Planned)	59		1185	1234				

The situation of Scientists of Paletwe Hybrid Rice Seed Production according to the state and region from 2011-12 to 2015-16

No.	State & Region	Male	Female	Total
1.	Head Quarter/Extension	16	51	67
2.	Nay Pyi Taw	32	38	70
3.	Kachine	4	-	4
4.	Kayah	5	7	12
5.	Kayin	3	5	8
6.	Chin	5	-	5
7.	Sagaing	12	22	34
8.	Taningthari	6	2	8
9.	Bago	32	18	50
10.	Magwe	15	15	30
11.	Mandalay	50	37	87
12.	Mon	9	3	12
13.	Rakhine	5	3	8
14.	Yangon	4	4	8
15.	Shan	16	18	34
16.	Ayeyarwaddy	12	9	21
17.	DAR	4	6	10
	Total	230	238	468



Hybrid Rice Seed Production Technology

Hybrid rice Breeding

Hybrid Breeding

(3- Line Hybrid, A,B,R)

(2- Line Hybrid, S,R)

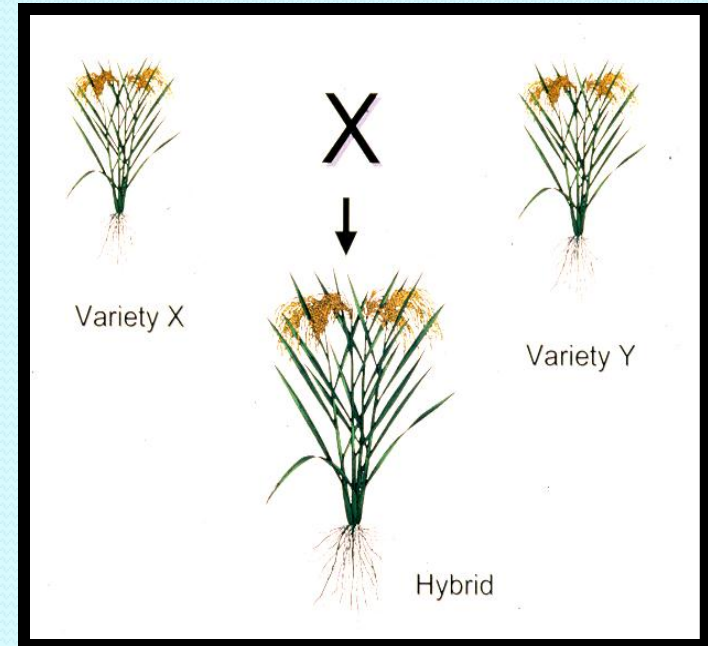
(1- Line Hybrid, Apomixis)

Inbred Breeding (OPV)

- Indigenous selection
- Introduction selection
- Hybridization selection
- Mutation breeding and selection
- Tissue culture breeding selection
- Molecular breeding (DOA)

Hybrid rice seed production technology

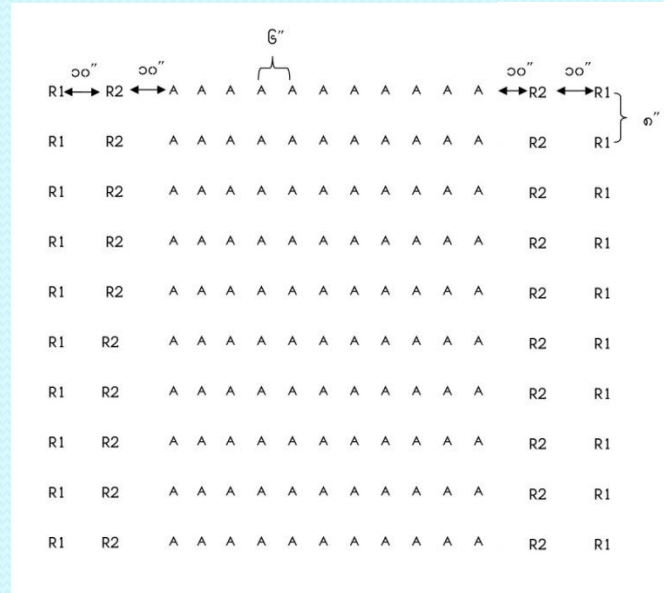
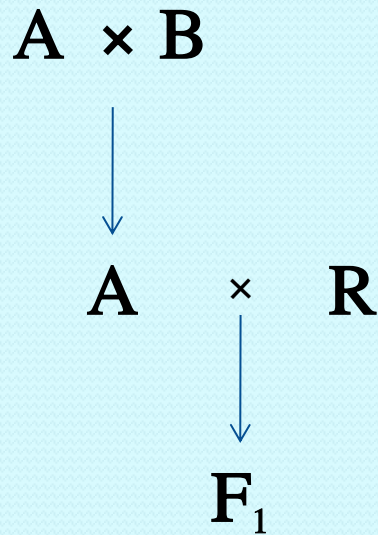
- Hybrid rice is the commercial rice crop grown from F1 seeds of a cross between two genetically dissimilar parents.
- Good rice hybrids have the potential of yielding 20-30% more than the best inbred variety grown under similar conditions.



- Why hybrid rice provide increased in yield, because of Heterosis or Hybrid Vigor

Procedure of Hybrid seed production

Male (2) rows, female (12) rows cultivation



A = Cytoplasmic genetic male sterility

B = Maintainer line

R = Restorer line

F₁ = hybrid

R line and A line, for synchronization of flowering time, R lines(R1, R2) one week interval sowing at 2 difference times

Treatments on synchronization of R line and A line flowering time

- (1) date of sowing time depend on R line and A line flowering time
- (2) 2-3 times of sowing in R line
- (3) synchronization on irrigation and drainage
- (4) delay of flowering time by applying urea fertilizer
- (5) earlier flowering time by applying of T-super and Potash
- (6) Applying hormone
- (7) examine on growth development and EPI stage

Flowering Time Synchronization Methods

- ❖ Growth Duration Method
- ❖ Leaf Number Method
- ❖ Effective Accumulated Temperature

Procedure of hybrid rice seed production

- ❖ Site selection for hybrid seed production
- ❖ Seed sowing
- ❖ Fertilizer application on nursery bed
- ❖ A: R ratio & cultivation system
- ❖ Fertilizer application
- ❖ Irrigation and drainage
- ❖ Examine on EPI stage
- ❖ Flag leaf Clipping
- ❖ GA3 application
- ❖ Supplementary pollination
- ❖ Rouging
- ❖ Harvesting

3 parts of Hybrid Rice Technology

- 1) **Breeding of A,B,R Lines and F1 (Breeding Work)**
- 2) **F1 seed Production (Seed Production Work)**
- 3) **Distribution of F1 Seed and Cultivation (Marketing / Extension Work)**

Hybrid rice technology is a kind of Seed Business

- **Seed Grantee**
- **Low cost/more profit**
- **Quality Control**
- **Customer Preference/Marketable**

Cost of cultivation and benefit

❖ Cost of cultivation

- Parental line cost (A+R)	-	0.3 Million
- Input cost	-	0.6 M
- Machine/ labour cost	-	0.45 M
- cleaning and packaging cost	-	0.15 M
- Total cost	-	0.15 M

❖ Yield per acre & Income

- Yield per acre (Average)	-	1000 kg
- price of 1 kg	-	3000 ks
- Income	-	0.30 M

❖ Benefit Per Acre

- 0.15 M

Expansion of Hybrid Rice Production Technology

- Establishment of Own Parental Lines
 - ✓ One combination of A,B, R lines
 - ✓ Cross and select 8-10 seasons
 - ✓ Attain genetically stable lines
 - ✓ Test, produce and expand the HR
 - ✓ It can take 8-10 years to get acceptable parental lines
- F1 Seed Production
 - ✓ Produce seed of market acceptable parental lines
 - ✓ Governmental staffs should learn and practice hybrid seed production to be seed production specialists
 - ✓ Disseminate the hybrid rice seed production technology and produce HR seed in collaboration with farmers and private seed companies

Expansion of Hybrid Rice Production Technology

- F1 Hybrid Production

- Demonstrate by model farms, training and field discussion to be in line with GAP 14 facts in the adoption of hybrid rice production technology
- Educate and train the farmers to be familiar with F1 production technology
- Initiate the contract farming with farmers, millers, brokers and retailers
- Demonstrate the pre harvest and post harvest technologies for getting market acceptance and high price
- Sustain the hybrid rice production technology

Hybrid Rice Seed Producing Private Companies and Future Prospects

- Myanmar New Ayar Co. LTD.
- Great Wall Co. LTD.
- Nine Sea Seed Co. LTD.

ဂရိတ်ဝေါကုမ္ပဏီလီမိတက်၏ ပုလဲသွယ်စပ်မျိုးစပါး (GW1) မျိုးစေ့ထုတ်စိုက်ခင်း



GREAT WALL
&
WIN-ALL HI-TECH SEED CO., LTD



GW-1

အထူးအထွက်တိုး ခပ်မျိုးစပါး မျိုးစေ့ထုတ်လုပ်ငန်း



ဆက်သွယ်ရန် - ၃လမ်း၊ ရတနာရတနာကြား၊ ဂရိတ်ဝေါကုမ္ပဏီလီမိတက်၊ မန္တလေးမြို့။
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08 11 2014

ပင်လယ်ကိုးသွယ် မျိုးစေ့ထုတ်ကုမ္ပဏီ၏ ပုလဲသွယ်စပ်မျိုးစပါး မျိုးစေ့ထုတ်စိုက်ခင်း



နယူးဇရာကုမ္ပဏီ၏ ပုလဲသွယ်စပ်မျိုးစပါး(F₁)
ဧက(၇၀)မျိုးစေ့ထုတ်စိုက်ခင်း
 ဒက္ခိဏသီရိမြို့နယ် ကျားကူးအနောက်ကျေးရွာ



ပုလဲသွယ်စပ်မျိုးစပါး တစ်ဆက်တစ်စပ်တည်း ဧက(၂၂၂) မျိုးစေ့ထုတ် စိုက်ခင်း

ဘောင်
 ၂၀
 မြို့နယ်

တောင်
 တွင်း
 မြို့နယ်



Thank You Very Much