



Ministry of Agriculture and Irrigation
Department of Agriculture



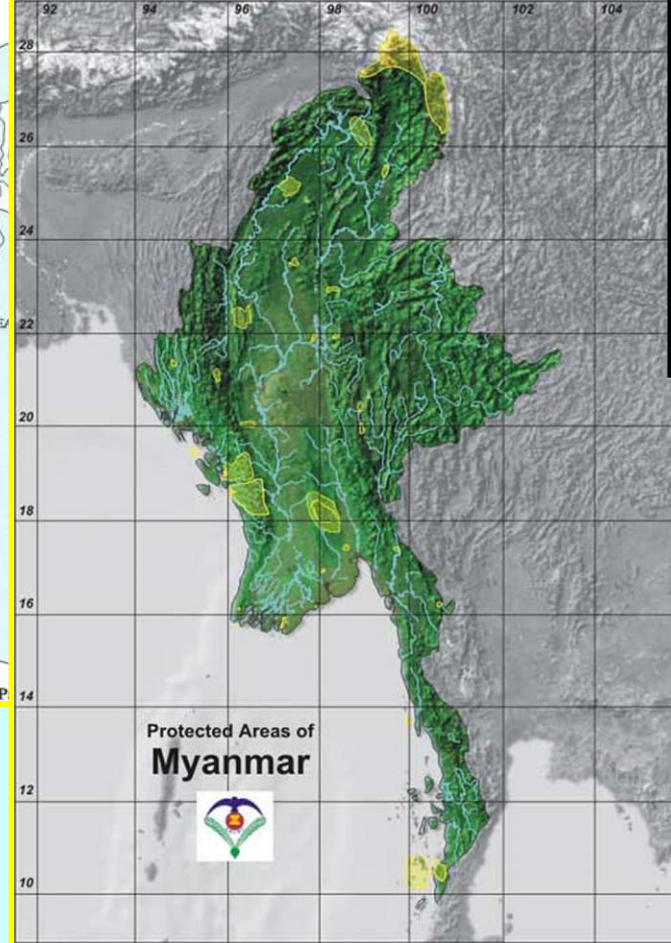
**Situation on Breeding and Production of
Rice in Myanmar**

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Department of Agriculture

2014 September-October

Location Map of Myanmar



Climate

- Tropical
- Sub-tropical
- Temperate

Season

- Winter
- Summer
- Raining

Location

- Between Latitude $9^{\circ}32'$ and $28^{\circ}31' N$; Longitude $92^{\circ}10'$ and $101^{\circ}1' E$
- Sharing borders with Bangladesh, India, China, Laos and Thailand
- Area is about 676, 577 sq km

Population

- ❖ 60.38 million(2013)
- ❖ 1.01% annual growth rate
- ❖ 85/ km² population density



Three Main Tasks of Ministry of Agriculture and Irrigation (MOAI)

- ❖ Seed Production
- ❖ Training and Education
- ❖ Research and Development

ခမ္ဘာ့ကောက်ညှိခွေး

စပါးစေ့အတိုင်းအတာ	ဆန်စေ့အတိုင်းအတာ
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Objective of Agriculture Sector

- **Prior to fulfill the need of local consumption**
- **Export of surplus agricultural products for the**
- **increase of foreign exchange earning**
- **Assistance to rural development through agricultural development**

“Promotion of Productivity in Agriculture”



Area Contribution of Crop Groups

Sr. No.	Crops	Sown Area (000 ha)	Production (000 mt)	Sown area %
1.	Cereal Crops	9600	34355	38
2.	Oil Seed Crops	3950	3379	16
3.	Pulses	4700	5409	19
4.	Industrial crops	1300	10094	5
5.	Culinary crops	355	2043	1
6.	Other crops	5126		21
	Total	25031		100

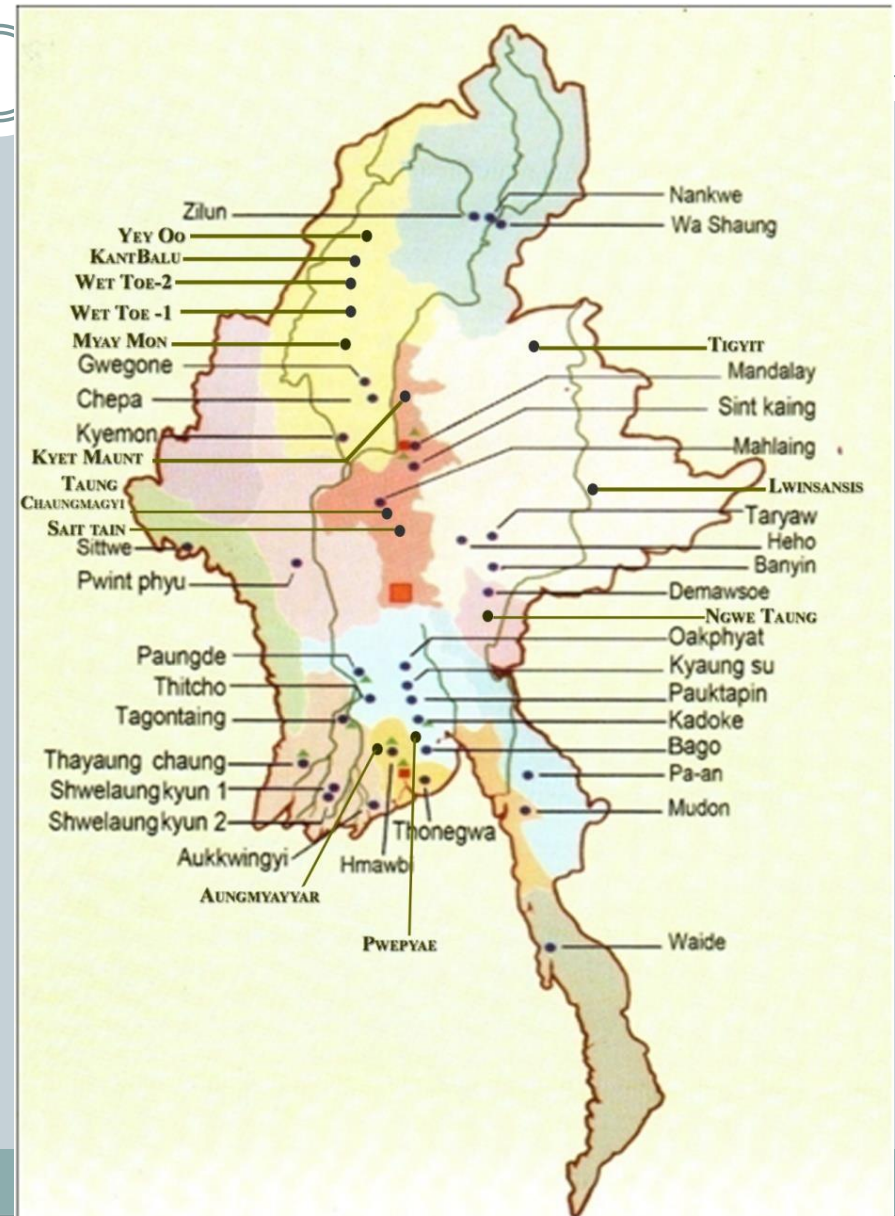
Cropping Intensity

- **The Government is rendering concerted efforts;**
 - to increase the production
 - to expand agricultural land
 - to improve yields and
 - to increase cropping intensity
- **Cropping intensity has increased from 119.16 % in 1988-89 to 180% in 2013-2014**



Seed production farms in Myanmar

- Research and seed farms – 68
- Seed farms – 44
- Research farms - 24



Seed Flow or Seed Multiplication System

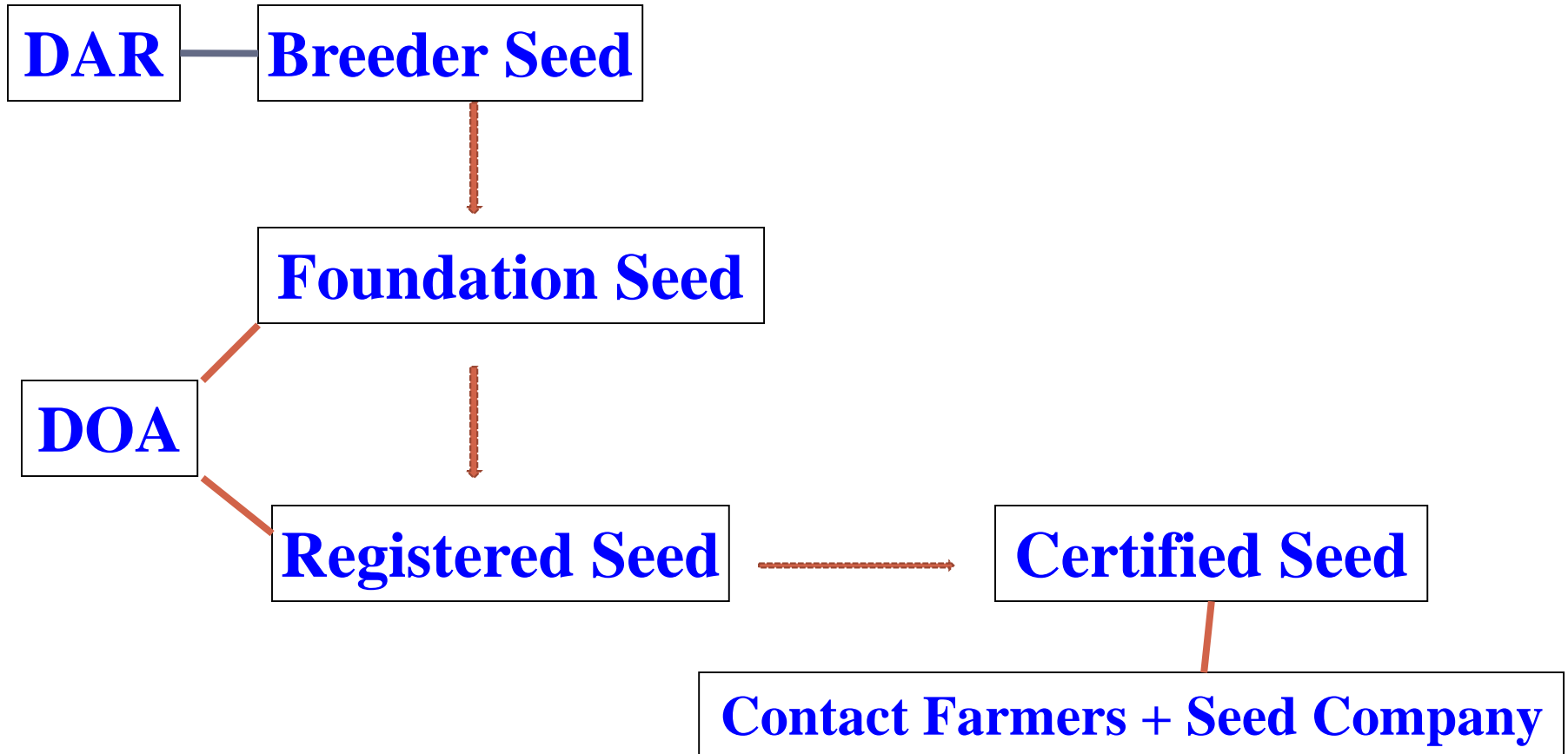
No.	Seed Classes	Responsible Organizations
1.	Breeder Seed	Department of Agricultural Research (DAR)
2.	Foundation Seed	DAR+ Department of Agriculture (DOA) Seed Division
3.	Registered Seed	DOA, Seed Division
4.	Certified Seed	DOA, Extension Division + Contact farmers + Seed Company

Seed Production and Distribution System

Public Sector



Private Sector



Procedure for New Varieties in Myanmar

**Hybridization
and selection**

Introduction

**Indigenous
selection**

**Mutation
Breeding**

**Molecular
Breeding**

Observation on stable lines

Yield trial (at least 3 times)

Adaptability test (at least 2 times)

Farmers' field testing

**Promising varieties by Technical
Seed Committee (TSC)**

National Seed Committee (NSC)

Nomination new varieties and producing

Seed multiplication

Seed Quality Control



- Field Inspection
 - ❖ 2-3 times from planting to harvesting
- Seed Sampling
- Seed Testing
- Seed Certification

The country's paddy production and surplus condition (2011-12)



Particular	Unit	Production, Consumption and Total Utilization
1. Sown acre	,000 acre	18761
2. Production	, 000 basket	1390346
	, 000 ton	29005
3. Population	In thousand	60438
- Rural population	In thousand	41898
- Urban population	In thousand	18540
4. Consumption	, 000 basket	850950
5. Seed stored for next planting season	, 000 basket	37522
6. Losses	, 000 basket	56283
7. Total utilization (4+5+6)	, 000 basket	744755
8. Surplus	-	-
- Based on consumption 2/4	%	63 %
- Based on total utilization 4/7	%	47 %

Paddy sown area and productivity



Year	Sown area (,000 ha)	Harvested area (000 ha)	Yield (MT/ha)	Production (,000 MT)
1995-96	6,138	6,033	3.08	18,580
2000-01	6,359	6,302	3.38	21,324
2005-06	7,389	7,384	3.75	27,683
2009-10	8,067	8,058	4.06	32,681
2010-11	8,047	8,011	4.07	32,579
2011-12	7,593	7,567	3.83	29,010
2012-13	7,241	7,208	3.84	27,704

Source: Myanmar Agriculture in Brief 2013, MOAI.

Overview of Hybrid Rice Production in the World



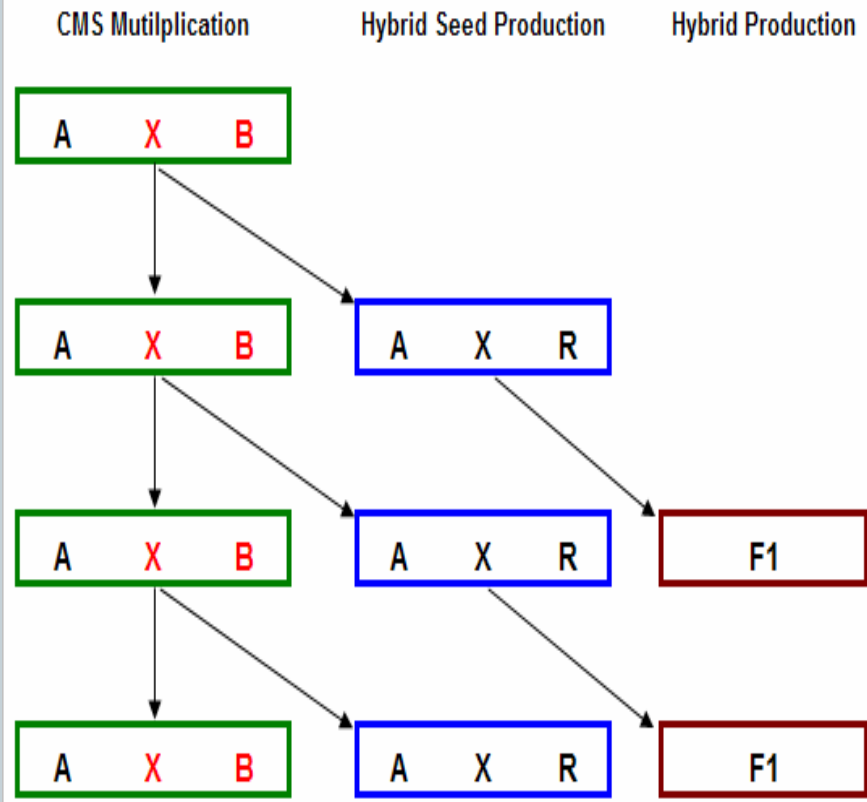
Current Situation of Hybrid Rice Production in Myanmar

အစိတ်စိတ် (R₁,R₂)Line အစိတ်စိတ် (A)Line အစိတ်စိတ် (R₁,R₂)Line အစိတ်စိတ် (A)Line အစိတ်စိတ် (R₁,R₂)Line အစိတ်စိတ် (A)Line အစိတ်စိတ် (R₁,R₂)Line အစိတ်စိတ် (A)Line

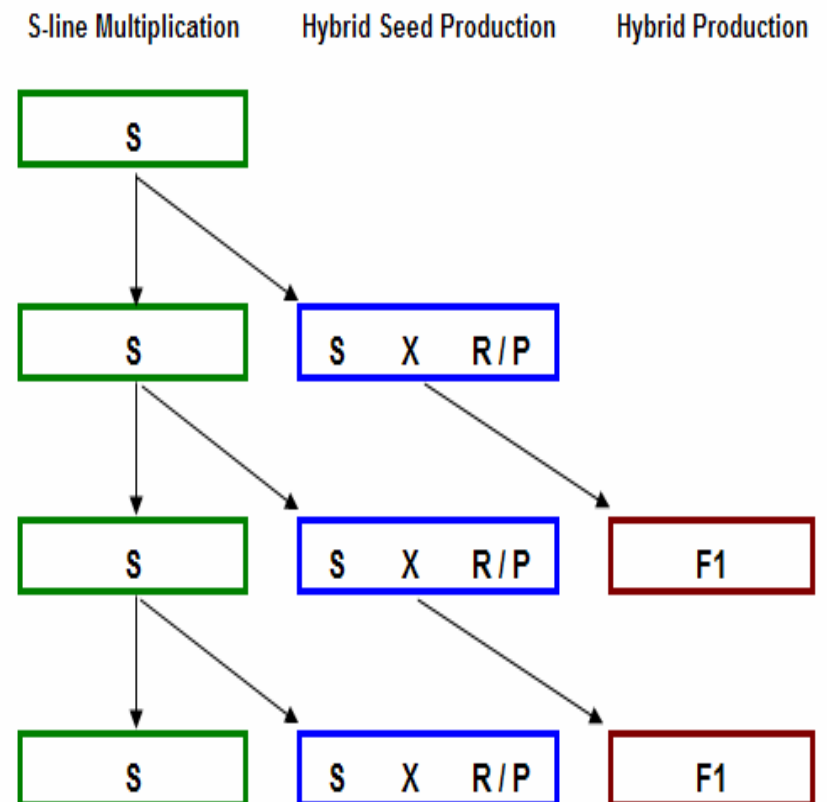
Objectives of Hybrid Rice Production in Myanmar

- ❖ To get more income to the farmers by cultivating of hybrid rice
- ❖ To emerge hybrid rice seed companies by transferring hybrid rice seed production technologies to the farmers and agricultural companies.
- ❖ To get hybrid rice seed with cheap price by producing hybrid rice seed in domestic.

Two Commercial Systems for Hybrid Rice



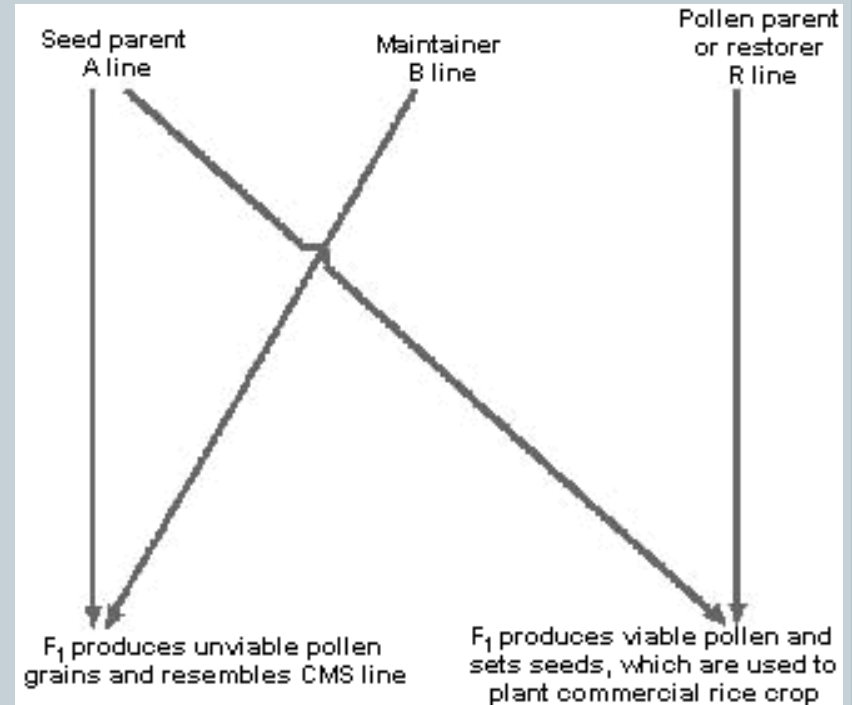
Three-Line Hybrid Rice Production



Two-Line Hybrid Rice Production

System of Hybrid rice seed production in Myanmar

Myanmar currently use three-line (A, B, R line) hybrid rice seed production system.



Requirements for 3 Lines in CMS System

- **A-line (Cytoplasmic male sterile Line)**
 - ✓ **Stable Sterility**
 - ✓ **Well developed floral traits for outcrossing**
 - ✓ **Easily, wide-spectrum, & strongly to be restored**
- **B-line (Maintainer Line)**
 - ✓ **Well developed floral traits with large pollen load**
 - ✓ **Good combining ability**
- **R-line (Restorer Line)**
 - ✓ **Strong restore ability**
 - ✓ **Good combining ability**
 - ✓ **Taller than A-line**
 - ✓ **Large pollen load, normal flowering traits and timing**



အပိုဆိုင်:
(R_1, R_2)Line

အပိုဆိုင်:
(A)Line

အပိုဆိုင်:
(R_1, R_2)Line

အပိုဆိုင်:
(A)Line

အပိုဆိုင်:
(R_1, R_2)Line

Hybrid rice seed production in Shwe Taung Farm

Hybrid rice (Palethwe) seed production in 2011-2012 (rainy season)



Sr	Location	Sown Area (acre)
1.	Shwe Taung Farm	100
2.	Yezin Agricultural University	100
	Total	200

Hybrid rice (Palethwe) seed production in 2011-2012 (summer season)

Sr	Location	Sown Area (acre)
1.	Shwe Taung Farm	200
2.	Yezin Agricultural University	100
3.	Yangon Region (Companies)	500
4.	Mon (Mudon & Thathone)	25
5.	Kayin (Hlaingbwet)	25
6.	Ayeyarwaddy region (Kangyidaunt)	3
	Total	853

Hybrid rice (Paletwe) seed production in 2012-2013 (rainy season)



Sr	Location	Sown Area (acre)	Production (Kg)
1.	Shwe Taung Farm	300	184800
2.	Yezin Agricultural University	70	52100
3.	Kachin State (Wine Maw)	10	8300
4.	Sagaing Region (Watlatt , MyinMu)	50	49888
5.	Bago Region (Pwe Pyayt Farm)	90	65950
6.	Magway Region(Pwint Phyu Seed Farm)	25	22351
7.	Mandalay Region (Patheingyi,Myit Thar)	50	38800
8.	Yangon Region (Companies)	45	4719
	Total	640	426908

Hybrid rice (Paletwe) seed production in 2012-2013 (summer season)

Sr.	Location	Sown Area (acre)	Production (Kg)
1.	Nay Pyi Taw	55	
2.	Yezin Agricultural University	35	
3.	CETC (100 days hybrid rice)	20	20106
4.	Kayin (Hlaingbwet)	50	24410
5.	Bago (Oattwin)	20	14379
	Mandalay	460	
6.	Shwe Taung Farm	450	
7.	Myittha	10	10930
	Mon State	20	4410
8.	Thathone	10	2550
9.	Mudone	10	1860
10.	Rakhine State (Sittwe, Kyauktaw)	10	3698
11.	Yangon (Hmawbe Farm and Companies)	541	400486
12.	Ayeyarwaddy (Pathein, Kangyidaunt, Kyankhinn, Pyapone)	40	24254
	Total	1197	502672

Hybrid rice (Palethwe) seed production in 2013-2014 (rainy season)



Sr.	Location	Sown Area (acre)	Production (Kg)
1.	Magway Region	20	18709
	Mandalay Region	500	
2.	Shwe Taung Farm	430	314545
3.	Pathein Gyi	40	33837.1
4.	Myittha	24	
5.	Sintkai	30	35603.15
6.	Southern Shan State (Taungyi, Loilin,Linkhae)	32	27000
7.	Northern Shan State (Lashio, Kyaukme, Muse, Kwanlon, Loatkai)	12	10480
	Total	552	429694.25

Hybrid rice (Palethwe) seed production in 2013-2014 (Summer season)



Sr.	Location	Sown Area (acre)	Production (Kg)
1.	Nay Pyi Taw	200	
2.	Bago	30	
	Mandalay	500	
3.	Shwe Taung	100	
4.	Great Wall Co., Ltd	400	
5.	Yangon Region (Hmawbe Farm)	20	
6.	Southern Shan State	31	
7.	Northern Shan State	3	
8.	Eastern Shan State	5	
9.	Ayeyarwaddy Region	20	
	Total	810	



**Hybrid rice seed
production in
Ayeyarwaddy region**



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**Hybrid rice seed
production in Yangon
region**



Hybrid rice production in Kayin State

Seed Distribution

❖ Using Palethwe Hybrid rice (F₁)seed (86564)kg produced in 2011-12 (rainy), (2443)farmers who are interested to cultivate Palethwe Hybrid rice from States and Regions could cultivated (7527) acres.

❖ Using Palethwe Hybrid rice (F₁)seed (95167)kg and Basmati Hybrid rice seed (983)kg produced in 2011-12 (summer), (38513)farmers who are interested to cultivate Palethwe Hybrid rice from States and Regions could cultivated (29595) acres.



Hybrid rice (F1) Cultivation



Year	Sown Area (ha)	Yield (mt/ha)	Production (MT)
2011-12 (Summer)	3046	6.13	23061
2012-13 (Rainy)	12618	5.16	78314
2012-13 (Summer)	11925	7.31	87124
2013-14 (Rainy)	17110	6.18	23.14
2013-14 (Summer)	17805	-	-

Increased in Yield/Acre



- 270 Baskets/acre in Nyaung Shwe Township in 2012-13
- 247 Baskets/acre in Patheingyi Township in 2012-13
- 230 Baskets/acre in Watlet Township in 2012-13
- Average 140-150 Baskets/acre
- Yield 2-3 times higher than other high yielding varieties

Ways to Synchronization of flowering



- (1) Growth Duration Method
- (2) Leaf Number Method
- (2) Effective Accumulated Temperature for
Synchronization

Procedures to be cured for Synchronization of Hybrid Rice Seed Production



- Seeding by adjusting the day of A and R seeding based on flowering period.
- To cover the A line flowering date by seeding the R line (2) to (3) times separately.
- Irrigation and drainage to A and R synchronize.
- By applying urea fertilizer to A line to late flowering stage of A.
- By applying urea and Triple-super phosphate for early flowering stage.
- By using 'hormone' for early and late flowering.
- Checking the heading stage and growth stage and then adjusting the needs.

Supplementary Pollination (Rope Pulling)



Sky view of hybrid rice seed production in Shwe Taung Farm



Future plan to develop rice production in Myanmar



- Significant increase in investments on research and development capacity skills enhancement, rice seed industry facilities and infrastructure.
- Reduction of the gap between real and potential productivity of rice in considering to sustain environment.
- Extension of public and private sector participation for environmentally friendly agriculture production ways and means.
- Proven technology for hybrid rice seed production and development.
- Development of research works on hybrid rice production.
- Capacity building activities and human resource development for key staff
- Development of Seed processing plants for hybrid rice production.
- Provision of updated information through multimedia
- Collaboration with NGO, INGO and other institutions

Conclusion



- Hybrid rice production program has been carried out both public and private sectors.
- To supply rice for increasing population, the requirement of paddy production is 41 million metric tons. The paddy yield needs to reach 5.15 metric ton per hectare.
- To meet the above mentioned requirements, the Government tried to increase the rice production with two categories, paddy sown area expansion and increase in rice yield per acre by hybridization.
- To develop adequate marketing systems of hybrid rice that will create satisfactory hybrid rice seed demand and adequate and timely supply of the required range of varieties of desired quality, at reasonable prices and at locations accessible to farmers.

An aerial photograph of a vast agricultural landscape. The foreground and middle ground are dominated by large, rectangular plots of vibrant green crops, likely corn, arranged in neat rows. A paved road with a few vehicles runs horizontally across the middle of the image. In the background, there are rolling green hills and a range of blue mountains under a clear sky. The overall scene is bright and sunny, suggesting a clear day.

**Thanks for your
kind attention**