Paddy Cultivation in Sri Lanka

By

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Origin of rice plant

Evidence says in China or in India

Species

- 22 species are documented in the world

  - 20 wild species and 2 cultivated species

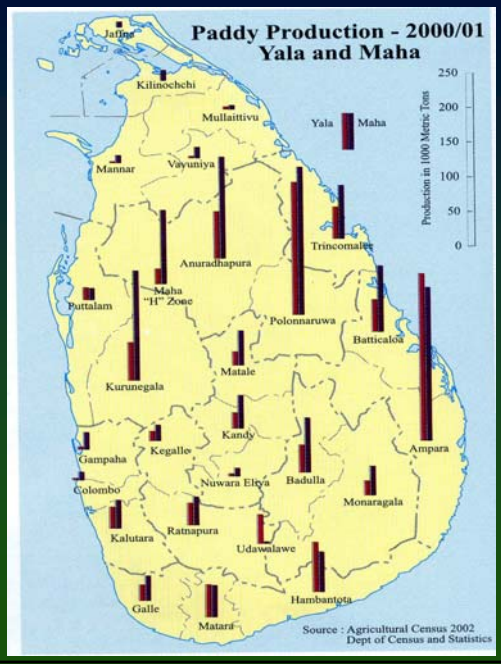
    - 2 cultivated species are
      - » *Orysa sativa* (L.)
        Orysa glaberima (stedu)

Available species in Sri Lanka

- 5 wild rices
  - O. nivara
  - O. ruffiphogon
  - O. risomatics
  - O. echingari

  - Cultivated species
  - O. sativa
    Group
    indica

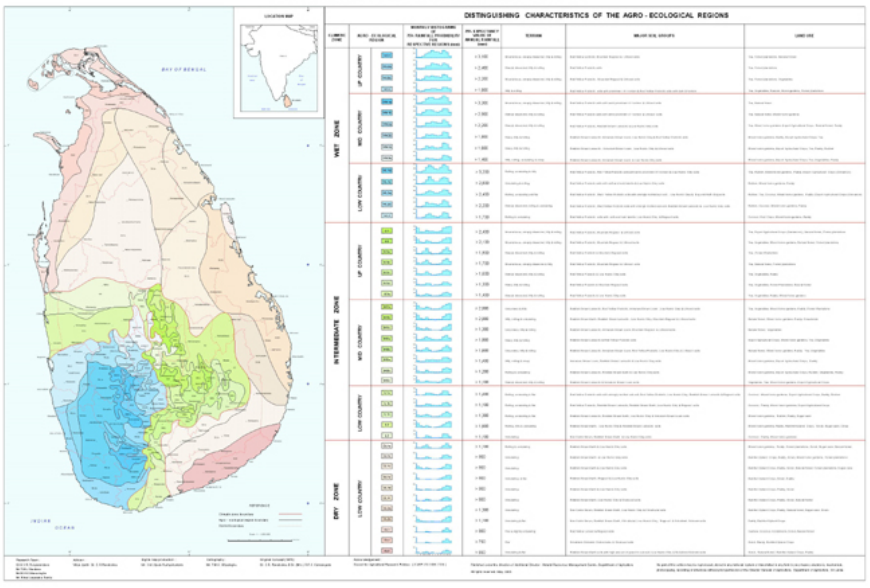
Distribution of rice in Sri Lanka



Rice Extent...

- Sri Lanka - 730,000 ha
- Dry & Intermediate - 610,000 ha
- Wet Zone - 120,000 ha

Agro Ecology



Districts

District	Agro ecology	Av. Yield Bu/Ac
Kalutara	WL1a, WL1b, WL2a	56
Colombo	WL1a, WL1b, WL2a, WL3	63
Galle	WL1a, WL2a	72
Gampaha	WL1a, WL1b, WL2b, WL3	66
Rathnapura	WL1a, WL2a	59
K'galle	WL1a,WL2b,	66
Matara	WL1a, WL2a	73

Until 1950 used Traditional methods

Traditional methods

- 1. Traditional rice varieties
- 2. Conventional land preparation
- 3. Organic fertilizer
- 4. “Kem” methods for pest and Disease control
- 5. Traditional harvesting , processing and storing methods

Land preparation using mamoty

Rural Agricultural Community Affair

Traditional Rice Varieties

- 600 varieties were reported

Gonabaru

Kahatawee

Sudu heenati

Herath Banda

Sulai-Traditional Rice variety

Due to scarcity of lands and increase of the population Agricultural Department take action to Develop the technology to increase the rice production

Varietal development

- Breeding objectives:
  - Increase yield potential
  - Incorporation of pest and disease resistance
  - Semi dwarf plant type
  - Response to fertilizer
  - Better grain quality

Breeding Commence 1950

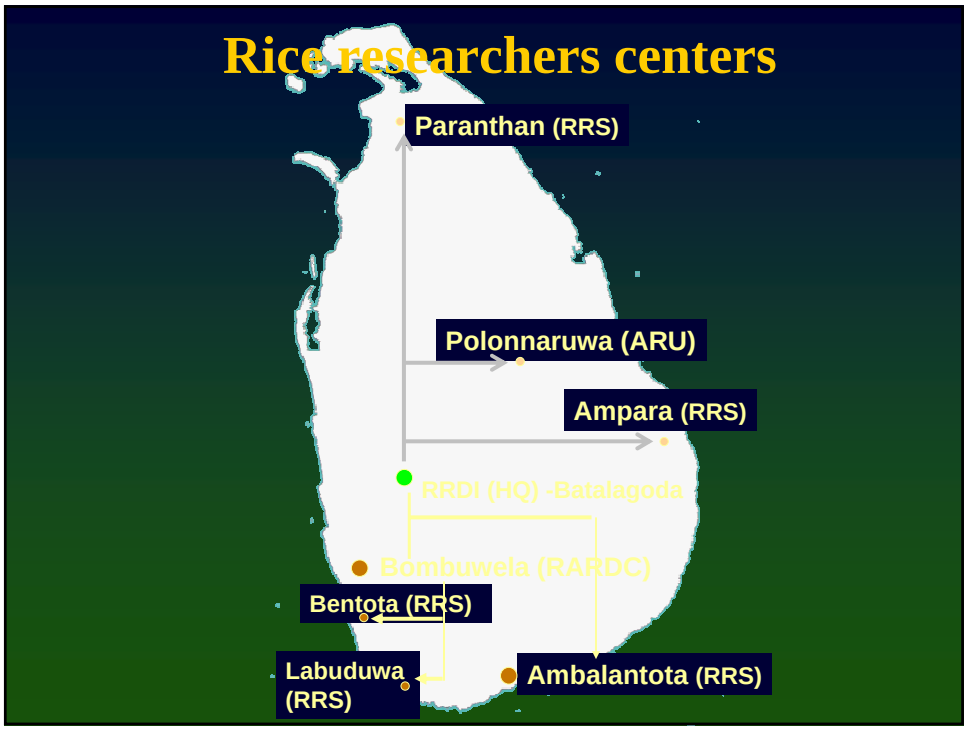
First bred variety named as H4

H- Hybridized

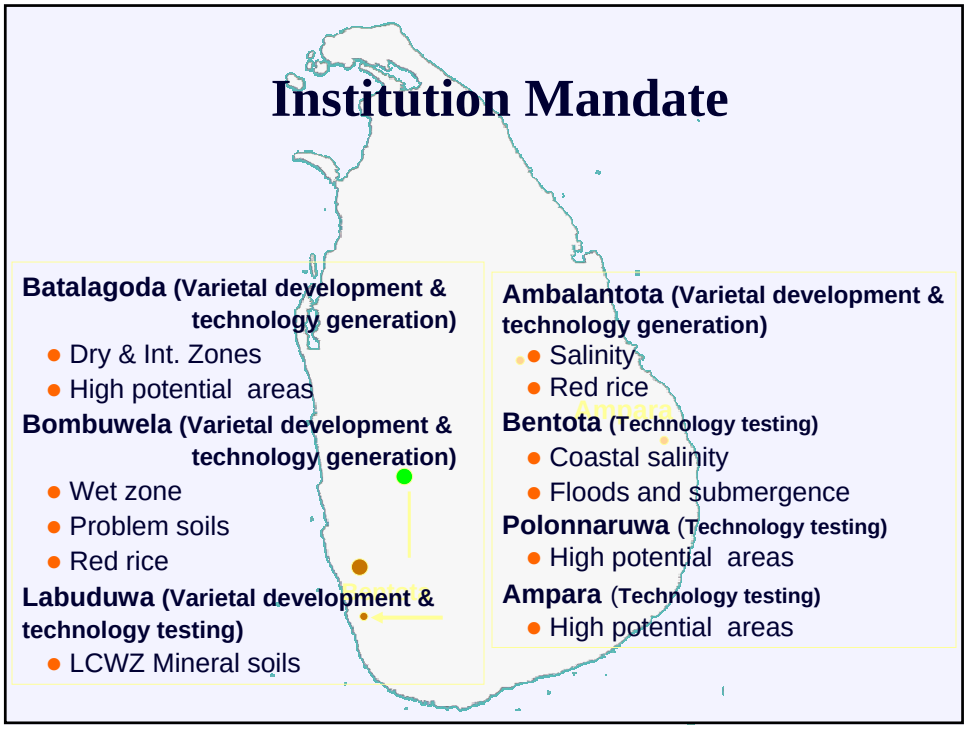
There are four Breeding Stations

Station	Abbreviation
Batalagoda	Bg
Bombuwala	Bw
Labuduwa	Ld
Ambalantota	At


Rice Research &
Development Institute


Rice researchers centers
Paranthan (RRS)
Polonnaruwa (ARU)
Ampara (RRS)
RRDI (HQ) -Batalagoda
Bombuwela (RARDC)
Bentota (RRS)
Labuduwa (RRS)
Ambalantota (RRS)

Institution Mandate



Batalagoda (Varietal development & technology generation)
- Dry & Int. Zones
- High potential areas

Bombuwela (Varietal development & technology generation)
- Wet zone
- Problem soils
- Red rice

Labuduwa (Varietal development & technology testing)
- LCWZ Mineral soils

Ambalantota (Varietal development & technology generation)
- Salinity
- Red rice

Bentota (Technology testing)
- Coastal salinity
- Floods and submergence

Polonnaruwa (Technology testing)
- High potential areas

Ampara (Technology testing)
- High potential areas

4 ½ Months	4 Months	3 ½ Months	3 Months
Bg 379-2	Bw 400	Bg 350	Bg 300
Bg 11-11	Bg 401	Bw 351	Bg 301
Bg 450	At 402	Bg 352	Bw 302
Bw 451	Bg 403	At 353	At 303
Bw 452	Bg 405	At 354	Bg 304
Bw 453	Bg 407(H)	Ld 355	Bg 305
		Ld 356	At 306
		Bg 357	At 307
		Bg 358	
		Bg 359	
		Bg 360	
		Bw 361	
		At 362	
		Bw 363	
		Bw 364	

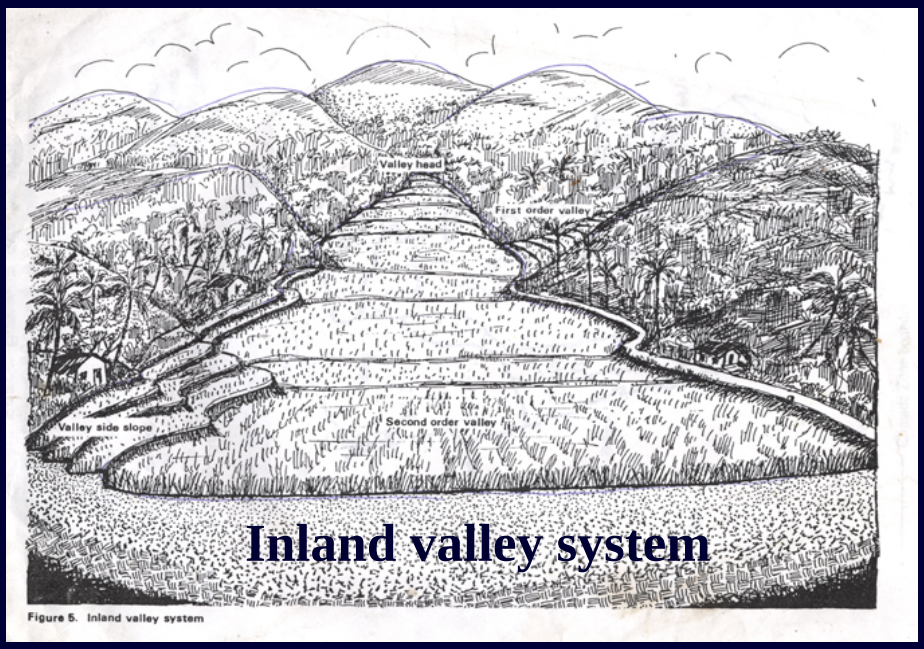


Figure 5. Inland valley system

Inland valley system

Constraints ...

a)**soil constraints (30 - 50%)**

- Acidic
- Fe, Mn and Al toxicities
- Organic matter/Sandy
- Deficiencies - Zn, Si
- Salinity


Fe Toxic soil


Fe Toxic Paddy field


Fe Toxic symptom in Rice plant


Fe Toxic condition
in Paddy filled

Constraints

b) Climatic constraints

- High rainfall
- High temperature
- High humidity
- Low sunlight intensity
- High wind

Breeding Objectives...

General objectives:

- **Increase yield potential**
- **Pest and disease resistance**
- **Acceptable grain characteristics**
- **Short age (3 & 3.5 m)**
- **Medium plant height (100-110cm) / Non lodging**

Objectives…

Specific Objectives

- **High seedling vigor**
- **Tolerance to adverse soils**
  - **Fe toxicity**
- **Wide adaptability to diverse environment**
- **Red rice/red samba**

On Going Activities

- Rice varietal improvement through Conventional breeding techniques

  a) Hybridization

  b) Mutation

Killing Pollan
(using hot water)

Ready for the Hybridization

Present new objectives

- Improvement of nutritional status for promoting health

What are the Health Promoting Functional Properties of Rice?

I. Micronutrient deficiencies- iron deficiency anemia

- affect all age groups in the country
- influence the productivity
- economic loss estimated 1.1% of GDP per capita

*** Phytates and tannins reduced the bio availability of iron in grains

Therefore important to identify high iron varieties with low phytates and tannings

Cont …..

2. Diabetic condition

High fiber content reduces the GI and reduces absorption of glucose by the body.

Therefore important to identify low GI varieties

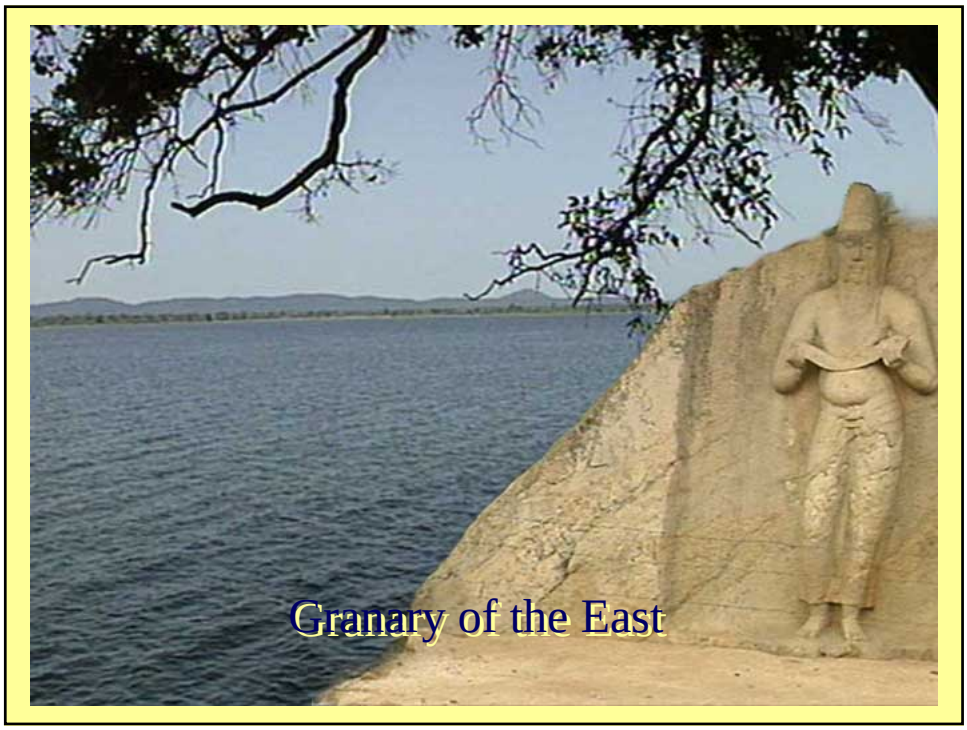
Cont …..

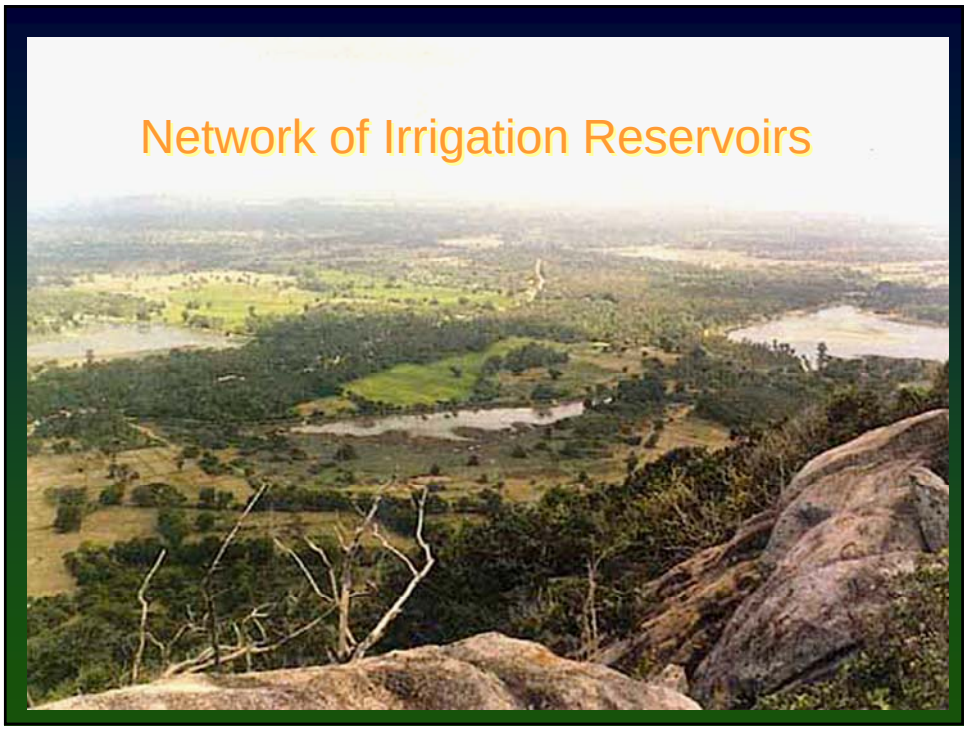
3. Cardio-vascular diseases

Rice bran contain natural antioxidents such as oryzanol and tocotrienols.

This property also reduces the cardio - vascular diseases


Tank, Village & Temple


Granary of the East


Network of Irrigation Reservoirs

Old

- Low yield
- Low fertilize Response

New

At present

- Rehabilitation & Reconstruction of Irrigation Systems


Old
New


Old
New

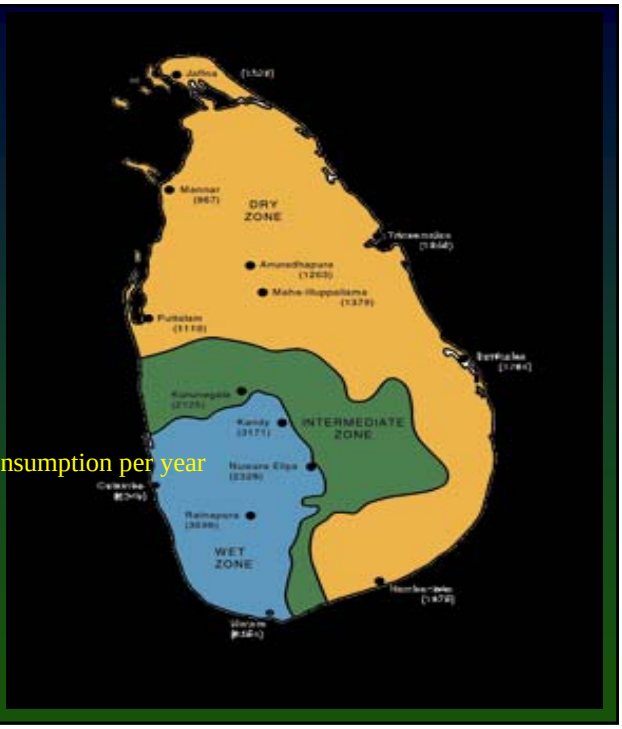

Old
New


The Present
Rehabilitation &
Reconstruction of Irrigation
Systems

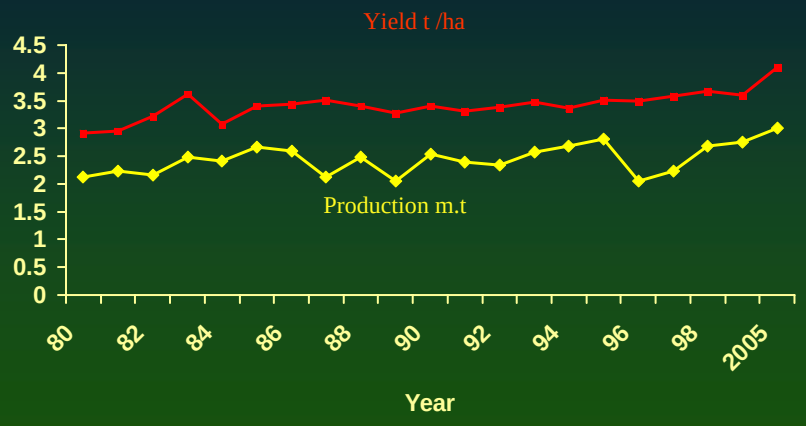
Statistics

Year	Production 000 Mt	Yield bu/ac	% Imports
1940	980	13	60
1950	970	34	50
1960	1242	42	40
1970	1539	49	25
1980	1748	66	10
1990	1993	70	5
2005	3000	82	1

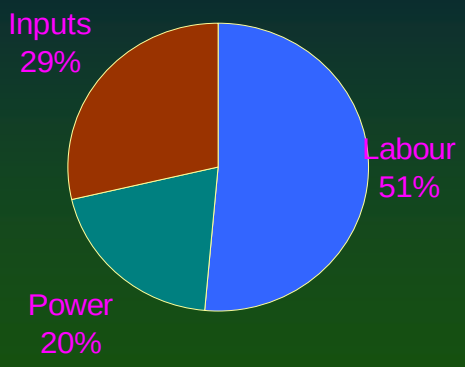
- 100 kg- Per capita rice consumption per year
- 45% carbohydrates
- 40% protein



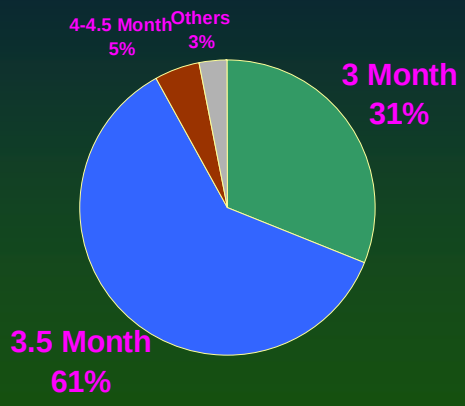
National production and yield



Cost of Production 2005



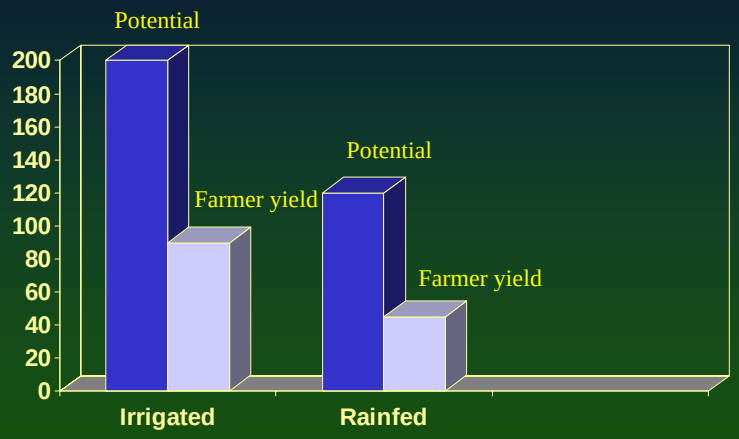
Varietal spread according to the age group 2005



National rice varietal spread %

Variety	1995	1997	2000
Bg 300	19.7	22.3	20.58
Bg 352	7.7	11.3	12.86
Bg 94-1	12.5	14.4	10.12
Bg 450	6.5	5.9	5.21
Bg 379/2	6.8	3.8	5.74
Bg 350	8.0	5.9	5.42
At 353	-	-	6.40
Ld 355	-	-	4.75
Bg 403	6.1	4.3	4.81
Bw 351	6.0	3.6	2.83

Rice yield under rain and irrigated



Thanks for your attention