E

UPOV

TWA/40/21
ORIGINAL: English
DATE: May 15, 2011

INTERNATIONAL UNION FOR THE PROTECTION OF NEW VARIETIES OF PLANTS

GENEVA

TECHNICAL WORKING PARTY FOR AGRICULTURAL CROPS

Fortieth Session
Brasilia, May 16 to 20, 2011

DEVELOPMENT OF REGIONAL SET OF EXAMPLE VARIETIES FOR SOUTH EAST ASIA FOR THE TEST GUIDELINES FOR RICE

document prepared by the Office of the Union

1. At its thirty-eighth session, held in Seoul, Republic of Korea, from August 31 to September 4, 2009, the Technical Working Party for Agricultural Crops (TWA), received a report from Mr. Edilberto Redoña, International Rice Research Institute (IRRI), concerning the development of a set of example varieties for rice for South-East Asia. The TWA agreed to invite him to present the full results for consideration at its thirty-ninth session.

2. Mr. Redoña was not able to attend the thirty-ninth session of the TWA, held in Osijek, Croatia from May 24 to 28, 2010. However, he expressed his willingness to attend a future session of the TWA.

3. The annex to this document contains the presentation submitted by Mr. Redoña to be discussed by the TWA at its fortieth session.

[Annex follows]

Presentation prepared by Edilberto Redoña, Senior Scientist (Plant Breeding) & Coordinator,
International Network for Genetic Evaluation of Rice (INGER),
International Rice Research Institute (IRRI)

Development of Regional Sets of Example Varieties for the Test Guidelines for Rice

Redoña ED, NM Singson, CU Toledo
International Network for Genetic Evaluation of Rice (INGER)

IRRI International Rice Research Institute

40th Session ,Technical Working Party for Agricultural Crops (TWA)
The International Union for the Protection of New Plant Varieties (UPOV)
Brasilia, Brasil
16-20 May 2011

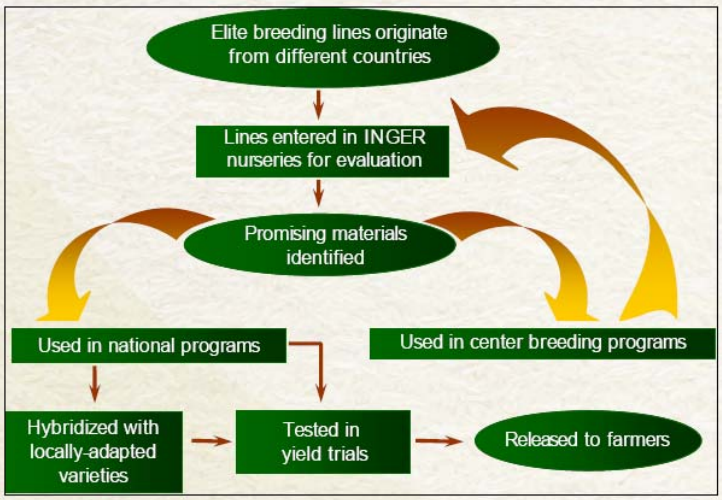
INGER

- International Network for Genetic Evaluation of Rice (http://seeds.irri.org/inger)
- Consortia of national agricultural research extension systems (NARES) and international agricultural research centers (IARCs)
- Oldest multilateral rice germplasm exchange and evaluation network (1975)

IRRI International Rice Research Institute

40th Session ,Technical Working Party for Agricultural Crops (TWA)
The International Union for the Protection of New Plant Varieties (UPOV)
Brasilia, Brasil
16-20 May 2011

INGER Nurseries



- 50 types of international trials since 1975
- Recent years: 115 locations, 31 countries

IRRI INTERNATIONAL RICE RESEARCH INSTITUTE

INGER/UPOV Collaboration

- 2004 UPOV-INGER Workshop on the Protection of Plant Breeder's Rights (Thailand): decided to establish a regional set of example varieties for Distinctness, Uniformity and Stability (DUS) testing
- Aim: to have a consistent basis for defining a state of expression of a given character (e.g. 65 characters in the UPOV Rice Test Guidelines; 17 asterisked)

IRRI INTERNATIONAL RICE RESEARCH INSTITUTE

Example Varieties

- Example varieties: needed to harmonize states of expression for characteristics with continuous variation and/or which are influenced by the environment
- Particularly important for asterisked characters or those included in all variety descriptions
- Can be used to help resolve differences in germplasm characterization for some descriptor states to come up with a single system of describing a variety

IRRI INTERNATIONAL RICE RESEARCH INSTITUTE

Different Rice Descriptors

- Pre-Existing Guidelines
  - UPOV Guidelines for the Conduct of Tests for Distinctness, Uniformity and Stability for Rice: used by PVP Offices
  - IRRI Descriptors for Rice: used by genebanks
  - Standard Evaluation System (SES) for Rice: used by varietal improvement scientists
- Differences
  - UPOV = 65 → 22 are not included in IRRI DR
  - IRRI / IPBGR = 45 (agronomic/morphological)
  - INGER (SES) = 112

IRRI INTERNATIONAL RICE RESEARCH INSTITUTE

Basis for Selecting Candidate EVs

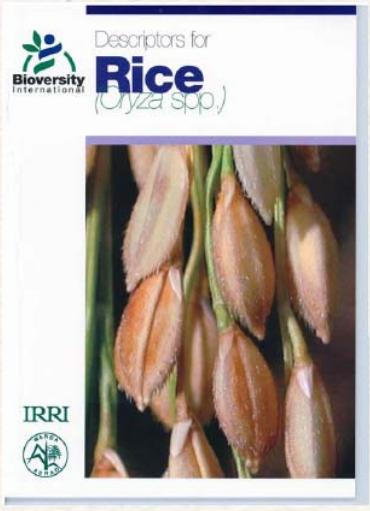
- Varieties of common knowledge
- Pure, uniform, stable
- Widely and freely available
- Easy to multiply/maintain
- Can be grown in both wet and dry season (tropical areas) if character has to be evaluated in the field
- Diverse set: all desired states of expression to be covered by the minimum number of example varieties

- For regional cooperation: wide adaptation
- Can be grown in many countries with similar conditions

IRRI International Rice Research Institute

Harmonized Variety Descriptions

- Bioversity International, IRRI, Africa Rice (2007)
  - http://www.bioversityinternational.org/index.php?id=19&user_bioversitypublications_pi1%5BshowUid%5D=2262
  - Several sets of UPOV rice characteristics has been incorporated in the revised descriptors



IRRI International Rice Research Institute

40th Session ,Technical Working Party for Agricultural Crops (TWA)
The International Union for the Protection of New Plant Varieties (UPOV)
Brasilia, Brasil
16-20 May 2011

Composing the INEVDUST

- Initially, 90 INGER materials (released as varieties or used as parents in crosses) from 20 countries and 3 international centers, evaluated in 2004 dry season and were characterized in 2005 wet season.

- Also, 66 out of 95 IR lines for INEVDUST passed the routine seed health tests. Additional entries also underwent seed processing and seed health testing.

IRRI
INTERNATIONAL RICE RESEARCH INSTITUTE

40th Session ,Technical Working Party for Agricultural Crops (TWA)
The International Union for the Protection of New Plant Varieties (UPOV)
Brasilia, Brasil
16-20 May 2011

Priority: Irrigated Rice Ecosystem

- Favorable environment; thus high probability of a successful trial
- Anticipated that application for PVP would be for varieties suited to this ecosystem
- Example varieties for irrigated environment could serve as EVs for other ecosystems/ other EVs could eventually be assembled by NARES

IRRI
INTERNATIONAL RICE RESEARCH INSTITUTE

40th Session ,Technical Working Party for Agricultural Crops (TWA)
The International Union for the Protection of New Plant Varieties (UPOV)
Brasilia, Brasil
16-20 May 2011

Procedure for Regional Cooperation

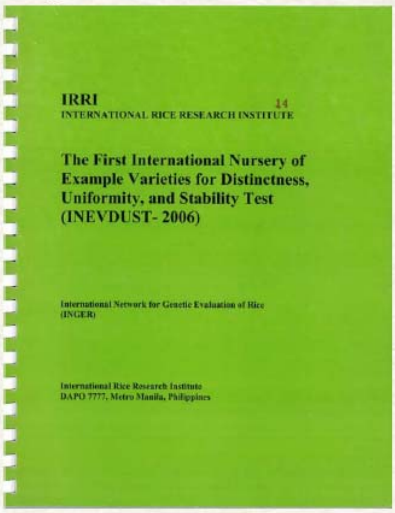
- Candidate EVs nominated by NARES and IRRI
- IRRI to identify candidate EVs from the IRRI Genebank, breeding programs and INGER based on asterisked characters.
- NARES candidate EVs to be sent to IRRI

- INEVDUST to be distributed to CORRA member countries and to other interested countries
- Data collected will be sent immediately to IRRI for analysis.
- Results will be shared with participants.

IRRI INTERNATIONAL RICE RESEARCH INSTITUTE

INEVDUST Objective

- To develop regional sets of example varieties for the 17 asterisked characters in rice for use in Distinctness, Uniformity and Stability Tests (DUST) in South and Southeast Asia, Southern China
- All desired states of expression for the asterisked characters should be covered with the minimum number of example varieties



IRRI INTERNATIONAL RICE RESEARCH INSTITUTE

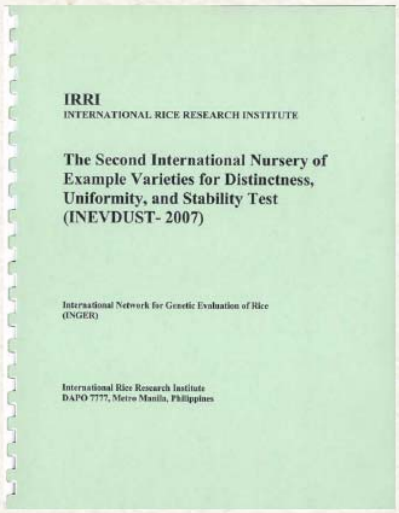
40th Session ,Technical Working Party for Agricultural Crops (TWA)
The International Union for the Protection of New Plant Varieties (UPOV)
Brasilia, Brasil
16-20 May 2011

INEVDUST Entries

- 2006: 1st INEVDUST
  - 78 Entries from six NARS* and from IRRI
- 2007: 2nd INEVDUST
  - 76 Entries from six NARS* and from IRRI
- 2008: 3rd INEVDUST
  - 77 Entries from four NARS** and from IRRI
- 2009: 4th INEVDUST
  - 77 Entries from four NARS** and from IRRI

*NARS: Bangladesh, India, Philippines, Sri Lanka, Colombia, Taiwan

**Bangladesh, India, Philippines, Sri Lanka


IRRI
INTERNATIONAL RICE RESEARCH INSTITUTE

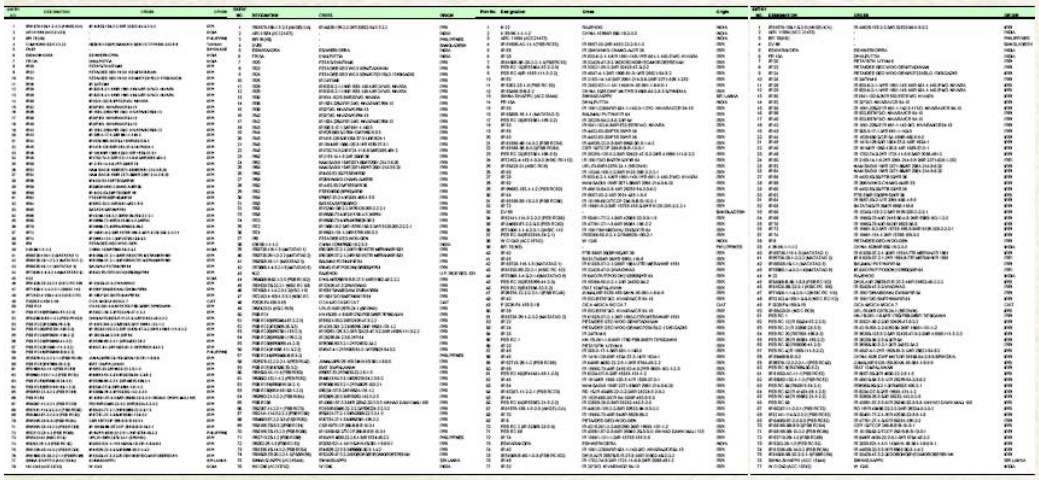
The Second International Nursery of Example Varieties for Distinctness, Uniformity, and Stability Test (INEVDUST- 2007)

International Network for Genetic Evaluation of Rice (INGER)

International Rice Research Institute
DAPO 7777, Metro Manila, Philippines

INEVDUST Entries

2006 List | 2007 List | 2008 List | 2009 List



78 entries | 76 entries | *77 entries

2006 (7 countries; 13 sites)
- MYANMAR: Yezin
- THAILAND: Thanyanburi
- VIETNAM: Cantho
- BANGLADESH: Gazipur
- INDIA: Hyderabad; Pantnagar; Chatha; Coimbatore; Chinsurah; New Delhi; Bhubaneswar
- NEPAL: Hardinath
- PAKISTAN: Kala Shah Kaku

2007 (7 countries, 8 sites)
- THAILAND: Muang Phrae
- VIETNAM: Cantho; Hau Giang
- BANGLADESH: Gazipur
- NEPAL: NRRP, Dhanusha
- PAKISTAN: Kala Shah Kaku
- INDONESIA: Sukamandi
- PHILIPPINES: Nueva Ecija

2008 (6 countries, 7 sites)
- MYANMAR: Yezin
- BANGLADESH: Gazipur
- INDIA: Khudwani, Hyderabad
- NEPAL: Hardinath
- BHUTAN: Bajo
- PAKISTAN: Kala Shah Kaku

2009 (6 countries, 11 sites)
- THAILAND: Pathum Thani
- VIETNAM: Cantho
- INDIA: Masodha, Imphal, Anantnag, Cuttack, Allahabad, Tripura
- INDONESIA: Bogor
- NEPAL: Hardinath
- MALAYSIA: Bertam

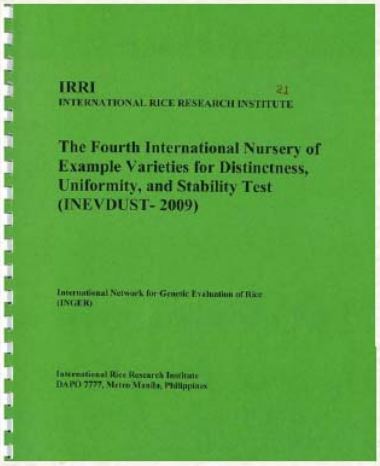
INEVDUST Dispatches 2006-2009

- 11 countries
- 39 trials

IRRI INTERNATIONAL RICE RESEARCH INSTITUTE

INEVDUST Nursery Establishment

- Optimal growing conditions
- Three rows per entry, 5 m long
- Transplanted conditions
- 20 x 20 cm hill spacing
- One seedling per hill
- Pest control on a need-based level
- Fertilizer and other cultural practices according to local practice


IRRI
INTERNATIONAL RICE RESEARCH INSTITUTE

The Fourth International Nursery of Example Varieties for Distinctness, Uniformity, and Stability Test (INEVDUST- 2009)

International Network for Genetic Evaluation of Rice (INGER)

International Rice Research Institute
DAPO 7777, Metro Manila, Philippines

IRRI INTERNATIONAL RICE RESEARCH INSTITUTE

40th Session ,Technical Working Party for Agricultural Crops (TWA)
The International Union for the Protection of New Plant Varieties (UPOV)
Brasilia, Brasil
16-20 May 2011

Asterisked Characters

Trait	Stage	State (Scores)								
Leaf Anthocyanin Coloration of Auricles (Early-Boot Stage)	40	Absent (1)	Present (9)							
Time of Heading (50% of plants with heads)	55		Early (70-90 days) (3)	Medium (90-110 days) (5)	Late (>110 days) (7)					
Flag Leaf: Attitude of Blade	50	Erect (1)	Semi-erect (3)	Horizontal (5)	Recurved (7)					
Spikelet: Pubescence of Lemma	60-80	Absent or Very Weak (1)	Weak (3)	Medium (5)	Strong (7)	Very Strong (9)				
Lemma: Anthocyanin Coloraton of Apex (Early Observation)	65	Absent or Very Weak (1)	Weak (3)	Medium (5)	Strong (7)	Very Strong (9)				
Spikelet: Color of Stigma	65	White (1)	Light Green (2)	Yellow (3)	Light Purple (4)	Purple (5)				
Non prostrate varieties only: Stem Length	70-90	Very Short (<51 cm) (1)	Short (51-90 cm) (3)	Medium (91-130 cm) (5)	Long (131-150 cm) (7)	Very Long (>150 cm) (9)				
Stem: Anthocyanin Coloration of Nodes	70	Absent (1)	Present (9)							
Panicle: Distribution of Awns	70-80	Tip only (1)	Upper Quarter Only (2)	Upper Half Only (3)	Upper Three Quarters Only (4)	Whole Length (5)				
Panicle: Length of Main Axis	72-90	Short (<=20 cm) (3)	Medium (21-30 cm) (5)	Long (>30 cm) (7)						
Panicle: Attitude in relation to Stem	90	Upright (1)	Semi-upright (2)	Slightly Drooping (3)	Strongly Drooping (4)					
Flag Leaf: Attitude of Blade (Late Observation)	90	Erect (1)	Semi-erect (3)	Horizontal (5)	Recurved (7)					
Panicle: Attitude of Branches	90	Erect (1)	Semi-erect (3)	Spreading (5)						
Decorticated grain: Length	92	Short (<5.5 mm) (3)	Medium (5.51-6.6 mm) (5)	Long (>7.5 mm) (7)						
Decorticated grain: Shape	92	Round (<1.5) (1)	Semi-round (1.5-1.99) (2)	Half-Spindle-Shaped (2.00-2.49) (3)	Spindle-Shaped (2.50-2.99) (4)	Long Spindle-Shaped (>2.99) (5)				
Decorticated Grain: Color	92	White (1)	Light Brown (2)	Variegated Brown (3)	Dark Brown (4)	Light Red (5)	Red (6)	Variegated Purple (7)	Purple (8)	Dark Purple/Black (9)
Decorticated Grain: Aroma	92	Absent or Weak (1)	Weak (2)	Strong (3)						

- 17 characters; 71 states of expression; According to UPOV's DUS Test Guidelines for Rice (2004)

IRRI INTERNATIONAL RICE RESEARCH INSTITUTE

40th Session ,Technical Working Party for Agricultural Crops (TWA)
The International Union for the Protection of New Plant Varieties (UPOV)
Brasilia, Brasil
16-20 May 2011

INEVDUST Data Returns

REGION/COUNTRY/LOCATION		2006	2007	2008	2009
	SOUTHEAST ASIA				
MYANMAR					
	YEZIN	✓		✓	
THAILAND					
	PATHUMTHANI	✓			
	THANYABURI			✓	✓
PHILIPPINES					
	MUNOZ, NUEVA ECIJA		✓		
	SOUTH ASIA				
BANGLADESH					
	GAZIPUR	✓	✓	✓	
INDIA					
	RAJENDRANAGAR,HYDER.	✓	✓	✓	
	PANTNAGAR, U.P.	✓			
	PULLA, A.P.	✓			
	CHINSURAH, W. BENGAL		✓		
	SHALIMAR , SRINAGAR, J & K		✓		
	RAIPUR, M.P.		✓		
	MASODHA, FAIZABAD		✓		
	KHUDWANI, ANANTNAG			✓	
	KANKE, RANCHI			✓	
	S.H.I.A.T.S. ALLAHABAD				✓
	IMPAL, MANIPUR				✓
	CRRI, CUTTACK				✓
NEPAL					
	HARDINATH, DHANUSHA	✓			
			✓	✓	

- 4 years
- 24/39 trials (62%)
- 6 countries
- 18 sites

No. of Sites:

2006: 7 sites, 6 countries

2007: 7 sites, 4 countries

2008: 6 sites, 5 countries

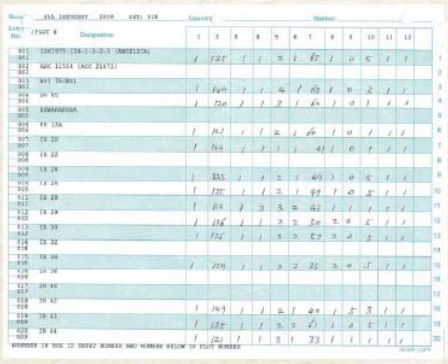
2009: 4 sites, 2 countries

IRRI INTERNATIONAL RICE RESEARCH INSTITUTE

40th Session ,Technical Working Party for Agricultural Crops (TWA)
The International Union for the Protection of New Plant Varieties (UPOV)
Brasilia, Brasil
16-20 May 2011

INEVDUST Geographical Distribution

Data Analysis



- Quality check
- Frequency counts of each state of expression for each trait and each variety in 2 regions during 4 years (2006-2009).
- Obtained entries with <u>consistent</u> state of expression for an asterisked trait across years in a specific region.
- Acceptable consistency level: same state of expression in at least 80% of trials
- Obtained minimum number of varieties/ lines covering the maximum number of states of expression for the 17 asterisked characters within the region for 3 years.

Number of entries with consistent states of expression for asterisked traits in Myanmar, Thailand, & Philippines

Trait / State	Number of entries
Leaf Anthocyanin Coloration of Auricles (Early-Boot Stage)	
Absent or Very Weak	73
Time of Heading (50% of plants with heads)	
Early	3
Medium	3
Late	1
Flag Leaf: Attitude of Blade	
Erect	20
Semi-erect	3
Spikelet: Pubescence of Lemma	
Weak	2
Lemma: Anthocyanin Coloraton of Apex (Early Observation)	
Absent or Very Weak	2
Spikelet: Color of Stigma (Stage 65)	
White	66
Purple	2
Non prostrate varieties only: Stem Length	
Short	1
Medium	2
Stem: Anthocyanin Coloration of Nodes (Stage 70)	
Absent	12
Panicle: Distribution of Awns	
Tip only	52
Whole Length	1

- In SE Asia, some traits were stable but the states were not well covered by the set of candidate varieties

Number of entries with consistent states of expression for required traits in Myanmar, Thailand, & Philippines

Trait / State	Number of entries
Panicle: Length of Main Axis (Stage 72-90)	
Medium	45
Panicle: Attitude in relation to Stem (Stage 90)	
Semi-upright	1
Slightly Drooping	2
Flag Leaf: Attitude of Blade (Late Observation)	
Erect	7
Semi-Erect	2
Recurved	2
Panicle: Attitude of Branches (Stage 90)	
Semi-erect	29
Decorticated grain: Length	
Medium	3
Long	3
Decorticated grain: Shape	
Long Spindle-Shaped	3
Decorticated Grain: Color	
White	22
Decorticated Grain: Aroma	
Absent or Weak	63

- In SEAsia, the test set did not cover all states of expression of the 17 traits in a stable manner.

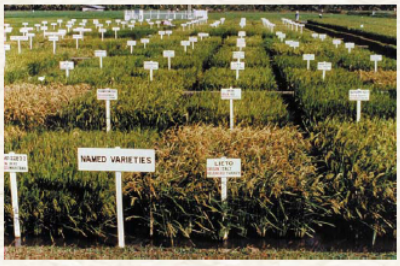
Minimum no. of varieties covering maximum no. of states of expression for 17 traits in Myanmar, Thailand, & Philippines

Trait	Varieties											
	THU KHA YIN	YEZIN LONE THWE	IR 70	CHIANUNG SEN YU 23	IR 30	IR 36	IR 58	IR 9202-25-1-3 (PSB RC92)	IR 52713-2B-1-2 (PSB RC88)	IR 65185-3B-8-3-2(PSB RC84)	FR 13A	WC1240 (ACC13742)
Leaf anthocyanin coloration of auricles	absent	absent	absent	absent	absent	absent	absent	absent	absent	absent	absent	absent
Time of heading	early	medium	medium	medium		early	early					
Flag leaf: attitude of blade (early observation)	semi-erect	semi-erect	erect	semi-erect	erect	erect			erect	erect		
Spikelet:pubescence of lemma	weak	weak							medium			
Lemma: anthocyanin coloration of apex	absent or very weak	absent or very weak										
Spikelet: color of stigma	white	white	white		white	white	white	white	purple	white	white	purple
Non prostrate varieties only: stem length	medium	medium		short		short	short					
Stem: anthocyanin coloration of nodes	absent	absent	absent		absent	absent	absent	absent		absent	absent	
Panicle: distribution of awns	tip only		tip only	tip only	tip only		tip only	tip only	tip only		whole length	whole length
Panicle: length of main axis	spreading	spreading	spreading	spreading	spreading		spreading	spreading	spreading	short	spreading	spreading
Panicle: attitude in relation to stem	slightly drooping	slightly drooping		semi-upright	semi-upright							
Flag leaf: attitude of blade (late observation)	recurved	recurved	erect	semi-erect	erect			semi-erect	erect	erect		
Panicle: attitude of branches	semi-erect	semi-erect	semi-erect	semi-erect		semi-erect		semi-erect	semi-erect			
Decorticated grain: length	medium	long	medium	long	medium		medium	medium			medium	medium
Decorticated grain: shape	long-spindle shaped	long-spindle shaped	spindle-shaped	long-spindle shaped		long-spindle shaped			long-spindle shaped	long-spindle shaped		
Decorticated grain: color	white	white	white	white		white	white	white		white		white
Decorticated grain: scent	absent or weak	absent or weak	absent or weak	absent or weak	absent or weak	absent or weak	absent or weak	absent or weak	absent or weak	absent or weak	absent or weak	absent or weak

* 30 states of expression from 17 traits were covered by 12 candidate varieties.

Next Step: Include varieties with traits of expression for following traits in Southeast Asia

Trait	State of Expression	Score
Leaf anthocyanin coloration of auricles	Present	9
Time of heading	Very early (< 70 days)	1
Flag leaf attitude of blade (early observation)	Horizontal	5
	Recurved	7
Spikelet: pubescence of lemma	Absent or very weak	1
	Strong	7
	Very Strong	9
Lemma: anthocyanin coloration of apex (Early observation)	Weak	3
	Medium	5
	Strong	7
	Very Strong	9
Spikelet Color of Stigma	Light Green	2
	Yellow	3
	Light Purple	4
Stem length for non-prostrate varieties	Very short (<51 cm)	1
	Long (131-150 cm)	7
	Very Long (>150 cm)	9
Stem anthocyanin coloration of nodes	Present	9
Panicle distribution of awns	Upper quarter only	2
	Upper half only	3
	Upper three quarters only	4
Panicle length of main axis	Long (>30 cm)	7
Panicle attitude in relation to stem	Upright	1
	Strongly drooping	4
Flag leaf attitude of blade (late observation)	Horizontal	5
Panicle attitude of branches	Erect	1
	Spreading	5
Decorticated grain length	Short (<5.5 mm)	3
Decorticated grain shape	Round (<1.5)	1
	Semi-Round (1.5-1.99)	2
	Half-spindle-shaped (2.00-2.49)	3
Decorticated grain color	Light brown	2
	Variegated brown	3
	Dark Brown	4
	Light Red	5
	Red	6
	Variegated purple	7
	Purple	8
	Dark Purple/Black	9
Decorticated grain: aroma	Weak	2
	Strong	3



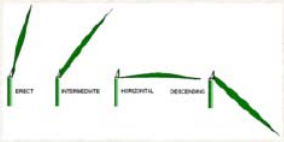
- In SE Asia, 41 states of expression (out of 71) from 17 asterisked characters were not stably covered by candidate varieties.

IRRI INTERNATIONAL RICE RESEARCH INSTITUTE

40th Session ,Technical Working Party for Agricultural Crops (TWA)
The International Union for the Protection of New Plant Varieties (UPOV)
Brasilia, Brasil
16-20 May 2011

Trait	State	Number of entries
Leaf Anthocyanin Coloration of Auricles (Early-Boot Stage)		
	Absent or Very Weak	3
Flag Leaf: Attitude of Blade		
	Erect	3
Spikelet: Pubescence of Lemma		
	Medium	1
Lemma: Anthocyanin Coloraton of Apex (Early Observation)		
	Absent or Very Weak	1
Spikelet: Color of Stigma (Stage 65)		
	White	1
	Light Green	1
Non prostrate varieties only: Stem Length		
	Short	2
Stem: Anthocyanin Coloration of Nodes (Stage 70)		
	Absent	1
Panicle: Distribution of Awns		
	Tip only	4
Panicle: Length of Main Axis (Stage 72-90)		
	Medium	1
Panicle: Attitude in relation to Stem (Stage 90)		
	Slightly Drooping	1
Flag Leaf: Attitude of Blade (Late Observation)		
	Semi-Erect	1
Decorticated grain: Length		
	Medium	1
Decorticated Grain: Color		
	Light Brown	1
Decorticated Grain: Aroma		
	Absent or Weak	20

Number of entries with consistent states of expression for required traits in Bangladesh, India, & Nepal



IRRI
INTERNATIONAL RICE RESEARCH INSTITUTE

Minimum no. of varieties covering maximum no. of states of expression for 17 traits in Bangladesh, India, & Nepal

Trait	Variety										
	IRRI 111	IR 52	IR61979-138-1-3-2-3 (ANGELICA)	CHIANUNG SEN YU 23	FR 13A	IR 36	IR 43	IR52713-2B-1-2 (PSB RC88)	IR62141-114-3-2-2-2 (PSB RC80)	Sabitri	ESWARA KORA
Leaf anthocyanin coloration of auricles	absent	absent			absent	absent	absent			absent	absent
Time of heading								medium			
Flag leaf: attitude of blade (early observation)			erect	erect	erect	erect	erect	erect	erect		
Spikelet:pubescence of lemma	medium		medium			weak	weak				
Lemma: anthocyanin coloration of apex	absent or weak										
Spikelet: color of stigma	white									light green	purple
Non prostrate varieties only: stem length	short	short	short	short			short			short	
Stem: anthocyanin coloration of nodes	absent	absent							absent		
Panicle: distribution of awns					whole length	tip only	tip only		tip only		
Panicle: length of main axis		medium								medium	
Panicle: attitude in relation to stem				slightly drooping					slightly drooping		
Flag leaf: attitude of blade (late observation)	semi-erect		erect		erect	erect		erect			
Panicle: attitude of branches		semi-erect						semi-erect			
Decorticated grain: length			long							medium	medium
Decorticated grain: shape											
Decorticated grain: color				light brown					white		
Decorticated grain: scent		absent or weak	absent or weak	absent or weak	absent or weak			absent or weak			absent or weak

*For South Asia, 35 (out of 71) states of expression from 17 traits were covered by 22 candidate varieties.

IRRI
INTERNATIONAL RICE RESEARCH INSTITUTE

40th Session ,Technical Working Party for Agricultural Crops (TWA)
The International Union for the Protection of New Plant Varieties (UPOV)
Brasilia, Brasil
16-20 May 2011

Minimum no. of varieties covering maximum no. of states of expression for 17 traits in Bangladesh, India, & Nepal

Trait	Variety										
	IR 8	IR54068-B-60-1-3-3 (PSB RC102)	SINNA SIVAPPU (ACC15444)	WC1240 (ACC13742)	ARC11554 (ACC21473)	DV85	IR 58	IR 64	IR69726-116-1-3 (MATATAG 1)	IR55423-01 (NSIC RC9)	IR73885-1-4-3-2-1-6(MATATAG 9)
Leaf anthocyanin coloration of auricles	absent	absent			absent			absent			
Time of heading							early	medium			
Flag leaf: attitude of blade (early observation)						erect					
Spikelet:pubescence of lemma											
Lemma: anthocyanin coloration of apex					strong				absent or weak		
Spikelet: color of stigma		white									
Non prostrate varieties only: stem length	short			medium	medium				short		
Stem: anthocyanin coloration of nodes			absent	present		present	absent				
Panicle: distribution of awns	upper half only		tip only								
Panicle: length of main axis				medium							
Panicle: attitude in relation to stem											
Flag leaf: attitude of blade (late observation)										semi-erect	
Panicle: attitude of branches											
Decorticated grain: length											
Decorticated grain: shape			semi-round								long-spindle shaped
Decorticated grain: color		white									
Decorticated grain: scent	absent or weak	absent or weak	absent or weak	absent or weak		absent or weak	absent or weak	absent or weak	absent or weak	absent or weak	absent or weak

Next Step: Include varieties with following states of expression for asterisked characters in South Asia

Trait	State of Expression	Score
Leaf anthocyanin coloration of auricles	Present	9
Time of heading	Very early (< 70 days)	1
	Late (>110 days)	7
Flag leaf attitude of blade (early observation)	Semi-erect	3
	Horizontal	5
	Recurved	7
Spikelet: pubescence of lemma	Absent or very weak	1
	Weak	3
	Strong	7
	Very Strong	9
Lemma: anthocyanin coloration of apex (Early observation)	Medium	5
	Strong	7
	Very Strong	9
Spikelet Color of Stigma	Yellow	3
	Light Purple	4
Stem length for non-prostrate varieties	Very short (<51 cm)	1
	Long (131-150 cm)	7
	Very Long (>150 cm)	9
Panicle distribution of awns	Upper quarter only	2
	Upper three quarters only	4

For South Asia, 41 states of expression (out of 71) were not stably covered by the set of candidate varieties examined.

IRRI INTERNATIONAL RICE RESEARCH INSTITUTE

40th Session ,Technical Working Party for Agricultural Crops (TWA)
The International Union for the Protection of New Plant Varieties (UPOV)
Brasilia, Brasil
16-20 May 2011

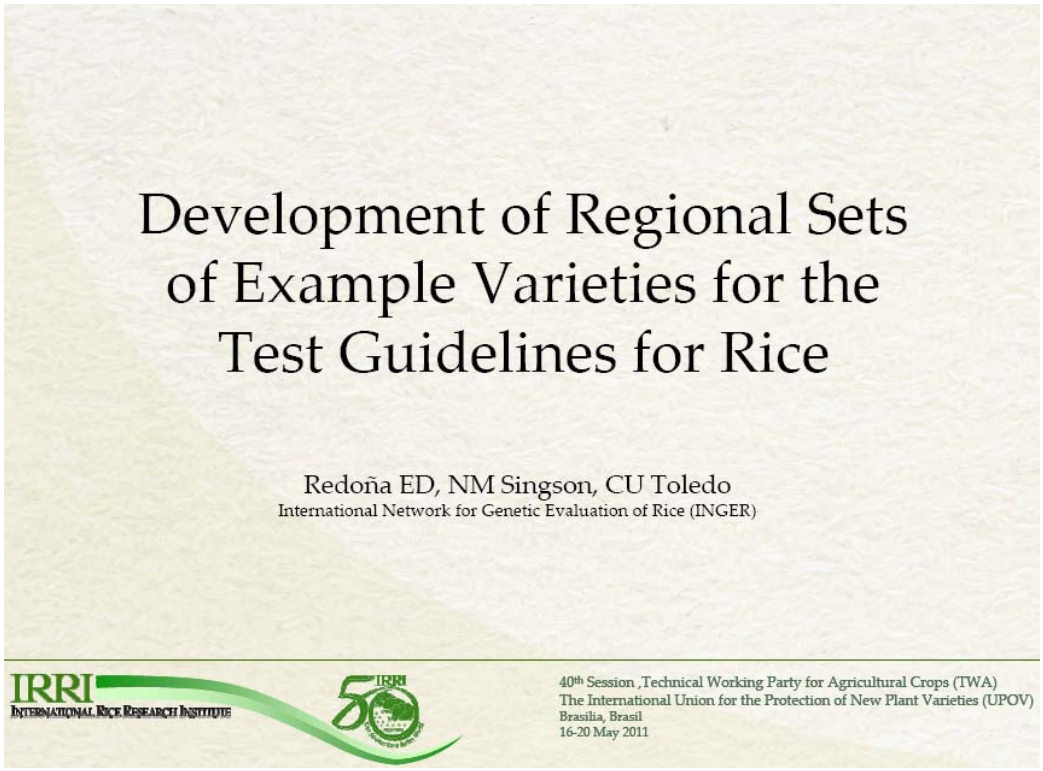
Summary

Region	Number of varieties with predominant and distinct states of expression For all traits	List of example varieties identified	States of expression not covered by identified varieties
South Asia	22	IR61979-138-1-3-2-3 (ANGELICA), IR68305-18-1-1 (MATATAG 3), DV85, IR 29, IR 36, IR 40, WC1240 (ACC13742), FR 13A, ESHWERKORRA, IR 38, IR 43,IR 8, IR52713-2B-1-2 (PSB RC88), N22, ARC11554 (ACC21473), IR64683-87-2-2-3-3 (PSB RC82), P2025-F4-159-3-1B, IR 58, IR 48, IR55423-01 (NSIC RC9), SINNA SIVAPPU (ACC15444	36
Southeast Asia	12	THU KHA YIN, YEZIN LONE THWE, IR 70, CHIANUNG SEN YU 23, IR 30, IR 36, IR 58, IR 9202-25-1-3 (PSB RC92), IR 52713-2B-1-2 (PSB RC88), IR 65185-3B-8-3-2(PSB RC84), FR 13A, WC1240 (ACC13742	41

Summary & Needs

- INEVDUST entries not diverse enough to cover all states of expression for asterisked traits
- Different minimum sets of potential example varieties identified for South and Southeast Asia
- Need to identify more candidate EVs to cover all states of expression, including those from the genebank
- Training for data collectors to ensure uniformity of descriptions and quality data generation
- NARES evaluating nurseries of candidate EVs need to link with the national PVP offices
- Provision of required resources for efficiently conducting trials
- Detailed data on INEVDUST available at INGER

IRRI INTERNATIONAL RICE RESEARCH INSTITUTE
40th Session ,Technical Working Party for Agricultural Crops (TWA)
The International Union for the Protection of New Plant Varieties (UPOV)
Brasilia, Brasil
16-20 May 2011



[End of Annex and of document]