



TWA/39/24

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INTERNATIONAL UNION FOR THE PROTECTION OF NEW VARIETIES OF PLANTS
GENEVA

TECHNICAL WORKING PARTY FOR AGRICULTURAL CROPS

Thirty-Ninth Session
Osijek, Croatia, May 24 to 28, 2010

**DEVELOPMENT OF REGIONAL SETS OF EXAMPLE VARIETIES 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. A copy of the presentation made by Mr. Redoña is provided as an annex to this document. He recalled that the focus of the project was to develop a set of example varieties for the asterisked characteristics in the UPOV Test Guidelines. The TWA thanked Mr. Redoña for his report and agreed to invite him to present the full results for consideration at its thirty-ninth session.
2. Mr. Redoña was contacted at short notice before the TWA session and explained that, in the time available, he would not be able to prepare a report. However, he expressed his willingness to attend a future session of the TWA.

[Annex follows]



ANNEX

Presentation made by Edilberto Redoña, Senior Scientist (Plant Breeding) & Coordinator, International Network for Genetic Evaluation of Rice (INGER), International Rice Research Institute (IRRI) at the thirty-eighth session of the TWA


38th Session of the UPOV
Technical Working Party for
Agricultural Crops (TWA)

Development of regional sets of
example varieties for the test
guidelines for rice


Highlights of INGER's INEVDUST, 2006-2008




INGER: Oldest Multilateral Germplasm Evaluation Network



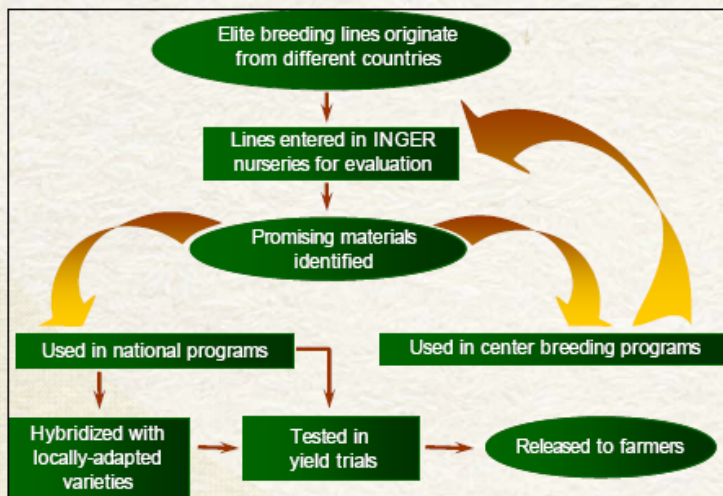
•52,430 entries evaluated
•2,800,848 seed samples



A partnership among national agricultural research systems (NARES) and international agricultural research centers (IARCs) established in 1975



INGER Primary Mechanism



- 50 types of international trials since 1975
- 2004-08 (12 ecosystem-based, 14 stress-oriented; average: 16 types/year)



INGER Test Sites



- 100s of rice scientists, 600 research stations, 85 countries
- Average, 2004-2008: 115 locations, 31 countries



INEVDUST

- 2004: at the UPOV-INGER Workshop on the Protection of Plant Breeder's Rights decided to establish the International Nursery of Example Varieties for Distinctness, Uniformity and Stability Test
- 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)
- Important for harmonizing the states of expression for characteristics which are influenced by the environment particularly for asterisked characteristics



INEVDUST

- 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 CIAT and IRRI



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

**Includes Bangladesh, India, Philippines, Sri Lanka

Objectives

- To establish rice example varieties (covering 17 characteristics) for Distinctness, Uniformity and Stability Test (DUST) in South, East, and Southeast Asia



Basis for Selecting Example Varieties

- Varieties of common knowledge
- Pure, uniform, stable
- Widely and freely available
- Ease of multiplication/maintenance
- Can be grown in both wet and dry season (tropical areas) if character of interest has to be evaluated in the field
 - photoperiod insensitive vs. photoperiod sensitive varieties
- Diverse set: All desired states of expression be covered with the minimum number of example varieties
- For regional cooperation: wide adaptation
 - can be grown in many countries with similar conditions



Priority Rice Ecosystem: Irrigated

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



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
- Nursery of DUST EVs will 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.

INEVDUST Sites

REGION/ COUNTRY/LOCATION	2006	2007	2008
EAST ASIA			
CHINA			
WENZHOU, ZHEJIANG	✓		
HANGZHOU, ZHEJIANG		✓	✓
DPR KOREA			
RYONGSONG , PYONG YANG	✓		
REPUBLIC OF KOREA			
SUWEON		✓	✓
SOUTHEAST ASIA			
MYANMAR			
YEZIN	✓		✓
THAILAND			
PATHUMTHANI THANYABURI	✓		✓
PHILIPPINES			
MUNOZ, NUEVA ECUIA		✓	

Total Sites:
2006: 9 sites, 7 countries
2007: 10 sites, 8 countries
2008: 9 sites, 7 countries

REGION/ COUNTRY/LOCATION	2006	2007	2008
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			✓
NEPAL			
KANKE, RANCHI			✓
HARDINATH, DHANUSHA	✓	✓	✓



Traits Observed

Trait	Stage	State					
Leaf Anthocyanin Coloration of Auricles (Early-Boot Stage)	40	Absent	Present				
Time of Heading (50% of plants with heads)	55	Very Early (<70 days)	Early (70-90 days)	Medium (90-110 days)	Late (>110 days)		
Flag Leaf: Attitude of Blade	50	Erect	Semi-erect	Horizontal	Recurved		
Spikelet: Pubescence of Lemma	60-90	Absent or Very Weak	Weak	Medium	Strong	Very Strong	
Lemma: Anthocyanin Coloration of Apex (Early Observation)	65	Absent or Very Weak	Weak	Medium	Strong	Very Strong	
Spikelet: Color of Stigma	65	White	Light Green	Yellow	Light Purple	Purple	
Non prostrate varieties only: Stem Length	70-90	Very Short (<51 cm)	Short (51-90 cm)	Medium (91-130 cm)	Long (131-150 cm)	Very Long (>150 cm)	
Stem: Anthocyanin Coloration of Nodes	70	Absent	Present				
Panicle: Distribution of Awns	70-80	Tip only	Upper Quarter Only	Upper Half Only	Upper Three Quarters Only	Whole Length	
Panicle: Length of Main Axis	72-90	Short (<=20 cm)	Medium (21-30 cm)	Long (>30 cm)			
Panicle: Attitude in relation to Stem	90	Upright	Semi-upright	Slightly Drooping	Strongly Drooping		
Flag Leaf: Attitude of Blade (Late Observation)	90	Erect	Semi-erect	Horizontal	Recurved		
Panicle: Attitude of Branches	90	Erect	Semi-erect	Spreading			
Decorticated grain: Length	92	Short (<5.5 mm)	Medium (5.51-6.8 mm)	Long (>7.5 mm)			
Decorticated grain: Shape	92	Round (<1.5)	Semi-round (1.5-1.99)	Half-Spindle-Shaped (2.00-2.49)	Spindle-Shaped (2.50-2.99)	Long Spindle-Shaped (>2.99)	
Decorticated Grain: Color	92	White	Light Brown	Variegated Brown	Dark Brown	Light Red	Red
Decorticated Grain: Aroma	92	Absent or Weak	Weak	Strong			

*17 traits, 68 states of expression



Data Analysis



- Data consistency checking
- Frequency counts of each state of expression for each trait and each variety in 3 regions during 3 years (2006-2008).
- Obtained lines that has distinct expression on each trait.
- **Lines that exhibit a predominant and distinct state of expression for a trait serve as example varieties for the specific region**

Varieties with Highest Number of Distinct Traits: East Asia

Trait	Designation									
	PSB RC 70	PSB RC 92	NSIC RC 112	NSIC RC 106	PSB RC 50	DV 85	IR 55423-01	CHIANUNG SEN YU 23	IR 25976-12-2-2-1-1	
Leaf Anthocyanin Coloration of Auricles (Early-Boot Stage)						absent	absent		absent	
Time of Heading (50% of plants with heads)	late	very early	medium	early	medium	medium		medium		
Flag Leaf: Attitude of Blade	horizontal	semi-erect			semi-erect	erect	erect			
Spikelet: Pubescence of Lemma	strong	weak	strong			weak		absent or very weak		
Lemma: Anthocyanin Coloration of Apex (Early Observation)	absent or very weak		absent or very weak	strong	medium		absent or very weak	very strong	absent or very weak	
Spikelet: Color of Stigma (Stage 65)	white	white	white	white	purple	purple	yellow	white	white	
Non prostrate varieties only: Stem Length										
Stem: Anthocyanin Coloration of Nodes (Stage 70)	absent	absent	absent	absent	absent	present	absent	absent	absent	
Panicle: Distribution of Awns	tip only	tip only	tip only	tip only	tip only		whole length	tip only	whole length	
Panicle: Length of Main Axis (Stage 72-90)	medium	medium	medium	medium	medium	medium		medium		
Panicle: Attitude in relation to Stem (Stage 90)	strongly drooping	strongly drooping	strongly drooping	semi-upright	strongly drooping	slightly drooping		strongly drooping		
Flag Leaf: Attitude of Blade (Late Observation)		recurved								
Panicle: Attitude of Branches (Stage 90)	semi-erect	semi-erect	semi-erect	semi-erect	semi-erect					
Decorticated grain: Length	long	short	long	long	medium		medium		medium	
Decorticated grain: Shape	long spindle-shaped	spindle-shaped	spindle-shaped	long spindle-shaped	spindle-shaped	half-spindle-shaped	half-spindle-shaped	long-spindle-shaped	half-spindle-shaped	
Decorticated Grain: Color	light brown	light brown	light brown	light brown		red	light brown	light brown	light brown	
Decorticated Grain: Aroma										

PSB RC 70 and PSB RC 92: 13 out of 17 traits

Varieties with Highest Number of Distinct Traits: East Asia

Trait	Designation							
	IR 44	IR 54	IR 24	IR 42	IR 48	IR 65185-3B-6-3-2 ESHWER KORRA	IR 58	W 1240
Leaf Anthocyanin Coloration of Auricles (Early-Boot Stage)			absent				present	
Time of Heading (50% of plants with heads)				late	late		very early	
Flag Leaf: Attitude of Blade	erect		erect	erect	semi-erect			recurved
Spikelet: Pubescence of Lemma	strong absent							
Lemma: Anthocyanin Coloration of Apex (Early Observation)	or very weak	absent or very weak	absent or weak	absent or weak	absent or weak	absent or very weak	absent or very weak	
Spikelet: Color of Stigma (Stage 65)	white	white	white			white	white	
Non prostrate varieties only: Stem Length						medium	very short	very long
Stem: Anthocyanin Coloration of Nodes (Stage 70)	absent	absent	absent			absent	absent	present
Panicle: Distribution of Awns	Upper Quarter Only	Upper Three Quarters Only						
Panicle: Length of Main Axis (Stage 72-90)						medium	short	
Panicle: Attitude in relation to Stem (Stage 90)				strongly drooping	strongly drooping	Upright		
Flag Leaf: Attitude of Blade (Late Observation)	erect spread		erect	erect	horizontal	erect		
Panicle: Attitude of Branches (Stage 90)	q	semi-erect		semi-erect	semi-erect			
Decorticated grain: Length		medium long spindle-shaped					short	medium
Decorticated grain: Shape							round	semi-round
Decorticated Grain: Color		light brown	light brown	light brown	light brown		light brown	light brown
Decorticated Grain: Aroma								

International Rice Research Institute

Varieties with Highest Number of Distinct Traits: East Asia

Trait	Designation					
	IR 39-96-1-1-1-2	IR 61979-138-1-3-2-3	IR 73885-1-4-3-2-1-6	N22	SINA SIVAPPU	IR 63 PSB RC 96
Leaf Anthocyanin Coloration of Auricles (Early-Boot Stage)						
Time of Heading (50% of plants with heads)					very early	
Flag Leaf: Attitude of Blade			erect			
Spikelet: Pubescence of Lemma	medium					weak
Lemma: Anthocyanin Coloration of Apex (Early Observation)				weak		
Spikelet: Color of Stigma (Stage 65)				white	light green	
Non prostrate varieties only: Stem Length					very short	
Stem: Anthocyanin Coloration of Nodes (Stage 70)	present		absent			
Panicle: Distribution of Awns	upper quarter				upper half only	
Panicle: Length of Main Axis (Stage 72-90)						
Panicle: Attitude in relation to Stem (Stage 90)			Semi-upright			
Flag Leaf: Attitude of Blade (Late Observation)			semi-erect			semi-erect
Panicle: Attitude of Branches (Stage 90)					erect	
Decorticated grain: Length	medium					
Decorticated grain: Shape						long spindle-shaped
Decorticated Grain: Color	light brown			light brown		white
Decorticated Grain: Aroma						

Varieties with Highest Number of Distinct Traits: South Asia

Trait	Designation									
	IR 61608-3B-20-2-2-1	FR 13 A	ARC 11554	IR 59552-21-3-2-2	MATATAG 3	PSB RC 96	DV 85	MATATA G 2	NSIC RC 106	NSIC RC 112
Leaf Anthocyanin Coloration of Auricles (Early-Boot Stage)	absent	absent	absent		absent	absent		absent	absent	absent
Time of Heading (50% of plants with heads)		late	late							
Flag Leaf: Attitude of Blade	erect	erect		recurved				erect		erect
Spikelet: Pubescence of Lemma			absent or very weak							
Lemma: Anthocyanin Coloration of Apex (Early Observation)	strong absent or very weak	weak	strong	weak	absent or very weak					
Spikelet: Color of Stigma (Stage 65)							purple			
Non prostrate varieties only: Stem Length	short		long							
Stem: Anthocyanin Coloration of Nodes (Stage 70)		Upper Three Quarters Only		absent	absent	absent	present		absent	
Panicle: Distribution of Awns	tip only			tip only	none	none	Whole Length	none	none	none
Panicle: Length of Main Axis (Stage 72-90)					medium	medium				
Panicle: Attitude in relation to Stem (Stage 90)		Semi-upright					Upright			
Flag Leaf: Attitude of Blade (Late Observation)	semi-erect			erect						
Panicle: Attitude of Branches (Stage 90)		Horizontal	erect							
Decorticated grain: Length						spindle-shaped and long-spindle shaped		long spindle-shaped	long spindle-shaped	long spindle-shaped
Decorticated grain: Shape	half-spindle-shaped		round	long-spindle shaped	spindle-shaped					
Decorticated Grain: Color	white	Light Red			white	light brown	light red	white	white	white
Decorticated Grain: Aroma	absent or weak				absent or weak	absent or weak	or weak	absent or weak	absent or weak	absent or weak

IR 61608-3B-20-2-2-1: most number of distinct traits in South Asia (10 out of 17 traits)



Varieties with Highest Number of Distinct Traits: South Asia

Trait	Designation								
	PSB RC 52	PSB RC 70	PSB RC 88	SINNA SIVAPPU	IR 36	IR 38	IR 50	IR 59682-132-1-1-2	IR 64
Leaf Anthocyanin Coloration of Auricles (Early-Boot Stage)	absent	absent			absent	absent	absent		absent
Time of Heading (50% of plants with heads)				very early			early		medium
Flag Leaf: Attitude of Blade	erect		erect		erect	erect			semi-erect
Spikelet: Pubescence of Lemma									
Lemma: Anthocyanin Coloration of Apex (Early Observation)									
Spikelet: Color of Stigma (Stage 65)				white		light green	light purple		
Non prostrate varieties only: Stem Length							very short		short
Stem: Anthocyanin Coloration of Nodes (Stage 70)									
Panicle: Distribution of Awns	none	none	none		tip only	tip only		Upper Quarter Only	
Panicle: Length of Main Axis (Stage 72-90)	medium	medium	medium	short				medium	
Panicle: Attitude in relation to Stem (Stage 90)									
Flag Leaf: Attitude of Blade (Late Observation)					erect	erect	erect	semi-erect	erect
Panicle: Attitude of Branches (Stage 90)									
Decorticated grain: Length				short				medium	
Decorticated grain: Shape	long spindle-shaped	long spindle-shaped	spindle-shaped	semi-round					
Decorticated Grain: Color	light brown	light brown	light brown	absent or weak					
Decorticated Grain: Aroma		absent or weak	absent or weak		Weak			absent or weak	



Varieties with Highest Number of Distinct Traits: South Asia

Trait	Designation									
	IR 68	IR 71505-1-1-4-2-3-1-2	PSB RC 30	PSB RC 4	PSB RC 9	PSB RC 34	W 1240	IR 29	IR 48	IR 61579-138-1-3-2-3
Leaf Anthocyanin Coloration of Auricles (Early-Boot Stage)	absent	absent	absent	absent					absent	late
Time of Heading (50% of plants with heads)				early						
Flag Leaf: Attitude of Blade	erect		erect					semi-erect		erect
Spikelet: Pubescence of Lemma										medium
Lemma: Anthocyanin Coloration of Apex (Early Observation)			absent or very weak							
Spikelet: Color of Stigma (Stage 65)			yellow	white						
Non prostrate varieties only: Stem Length							medium			short
Stem: Anthocyanin Coloration of Nodes (Stage 70)		absent								
Panicle: Distribution of Awns	upper quarter only	tip only			none	none	upper half only			
Panicle: Length of Main Axis (Stage 72-90)	long		medium		medium	medium				medium
Panicle: Attitude in relation to Stem (Stage 80)								strongly drooping		
Flag Leaf: Attitude of Blade (Late Observation)							horizontal			
Panicle: Attitude of Branches (Stage 90)					Spreading					
Decorticated grain: Length	long						short			
Decorticated grain: Shape						long spindle-shaped		spindle-shaped		
Decorticated Grain: Color		Variegated Brown		white	white	light brown	purple		red	
Decorticated Grain: Aroma			absent or weak	absent or weak	absent or weak	absent or weak		absent or weak	strong	



Varieties with Highest Number of Distinct Traits: South Asia

Trait	Designation											
	PSB RC 102	PSB RC 60	PSB RC 92	ESHWERKORRA	IR 43	IR 58	IR 65185-2-B-8-3-2	IR 72	K 33-96-1-1-1-2	BPI 76 (NE)	IR 22	IR 40
Leaf Anthocyanin Coloration of Auricles (Early-Boot Stage)							absent	present				
Time of Heading (50% of plants with heads)				very early				medium	early			
Flag Leaf: Attitude of Blade			erect						horizontal			
Spikelet: Pubescence of Lemma					weak							
Lemma: Anthocyanin Coloration of Apex (Early Observation)					medium							
Spikelet: Color of Stigma (Stage 65)		white		purple							light green	
Non prostrate varieties only: Stem Length						very short						
Stem: Anthocyanin Coloration of Nodes (Stage 70)												
Panicle: Distribution of Awns	none											
Panicle: Length of Main Axis (Stage 72-90)		medium				medium						
Panicle: Attitude in relation to Stem (Stage 90)			slightly drooping									
Flag Leaf: Attitude of Blade (Late Observation)												
Panicle: Attitude of Branches (Stage 90)					horizontal							erect Semi-erect
Decorticated grain: Length							medium					
Decorticated grain: Shape	spindle-shaped											
Decorticated Grain: Color	white	Dark Brown	white	purple		white		dark brown		Purple		
Decorticated Grain: Aroma	absent or weak	absent or weak	absent or weak				absent or weak		absent or weak	absent or weak	absent	

Varieties with Highest Number of Distinct Traits: Southeast Asia

Trait	Designation									
	IR 61608-3B-20-2-2-1	IR 59552-21-3-2-2	PSB RC 50	MATATAG 2	MATATA G 1	NSIC RC 110	NSIC RC 112	PSB RC 102	MATATAG 3	PSB RC 52
Leaf Anthocyanin Coloration of Auricles (Early-Boot Stage)	absent	absent	absent	absent	absent	absent	absent	absent	absent	absent
Time of Heading (50% of plants with heads)	early	late		medium	medium	medium	medium	late	early	medium
Flag Leaf: Attitude of Blade	erect	erect	semi-erect	semi-erect	semi-erect		semi-erect	erect	semi-erect	erect
Spikelet: Pubescence of Lemma	strong	weak								
Lemma: Anthocyanin Coloration of Apex (Early Observation)	absent or very weak	absent or very weak	very strong							
Spikelet: Color of Stigma (Stage 65)	white	white	purple	white					white	
Non prostrate varieties only: Stem Length	medium	long	short							
Stem: Anthocyanin Coloration of Nodes (Stage 70)	absent	absent	absent	absent	absent	absent	absent	absent	absent	absent
Panicle: Distribution of Awns	none		tip only	tip only	tip only	tip only	tip only	tip only	tip only	tip only
Panicle: Length of Main Axis (Stage 72-90)	medium	medium	medium	medium	medium	medium	medium	medium	medium	medium
Panicle: Attitude in relation to Stem (Stage 90)	strongly drooping	strongly drooping	semi-upright	upright	slightly drooping	slightly drooping	slightly drooping	slightly drooping	slightly drooping	slightly drooping
Flag Leaf: Attitude of Blade (Late Observation)	erect	erect	semi-erect		recurved	recurved				
Panicle: Attitude of Branches (Stage 90)			semi-erect	semi-erect	semi-erect		semi-erect			semi-erect
Decorticated grain: Length	medium	long	medium	long	long	long	long	long	long	
Decorticated grain: Shape										
Decorticated Grain: Color	light brown	white	light brown	white	white	white	white	light brown		light brown
Decorticated Grain: Aroma	absent or weak	absent or weak								

IR 61608-3B-20-2-2-1: most number of distinct traits in Southeast Asia (15 out of 17 traits)

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Varieties with Highest Number of Distinct Traits: Southeast Asia

Trait	Designation									
	PSB RC 96	NSIC RC 106	ARC 11554	IR 52713-2B-1-2	PSB RC 88	PSB RC 94	FR 13 A	IR 62141-114-3-2-2-2	N 22 5	PSB RC W 1240
Leaf Anthocyanin Coloration of Auricles (Early-Boot Stage)	absent	absent	absent	absent	absent	absent	absent		absent	absent
Time of Heading (50% of plants with heads)	early	early			medium	early				medium
Flag Leaf: Attitude of Blade				erect	erect			erect		
Spikelet: Pubescence of Lemma	absent or very weak			medium						
Lemma: Anthocyanin Coloration of Apex (Early Observation)			medium				weak		strong	
Spikelet: Color of Stigma (Stage 65)			white	purple			white	white	white	
Non prostrate varieties only: Stem Length										
Stem: Anthocyanin Coloration of Nodes (Stage 70)	absent	absent				absent			absent	absent present
Panicle: Distribution of Awns	tip only	tip only	tip only	none	tip only	tip only	upper quarter only	none	tip only	whole length
Panicle: Length of Main Axis (Stage 72-90)	medium	medium	medium	medium	medium	medium		medium	medium	
Panicle: Attitude in relation to Stem (Stage 90)	slightly drooping	semi-upright			semi-upright	slightly drooping			upright	
Flag Leaf: Attitude of Blade (Late Observation)				erect				erect		horizontal
Panicle: Attitude of Branches (Stage 90)	semi-erect	semi-erect	erect		semi-erect					spreading
Decorticated grain: Length	long								long	short
Decorticated grain: Shape							half-spindle-shaped		half-spindle-shaped	half-spindle-shaped
Decorticated Grain: Color		Dark Brown					light brown	variegated purple		
Decorticated Grain: Aroma			strong					Weak		

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Varieties with Highest Number of Distinct Traits: Southeast Asia

Trait	Designation													
	IR 43	IR 55423-01	IR 61573-138-1-3-2-3	IR 9202-25-1-3	BPI 76 (NS)	DV 85	ESHWER KORRA	K 39-96-1-1-1-2	IR 30	IR 65185-2-b-8-3-2	SINNA SIVAPPU	PSB RC 54	PSB RC 92	PSB RC 28
Leaf Anthocyanin Coloration of Auricles (Early-Boot Stage)	absent	very early	absent	present	medium	late	present	absent						
Time of Heading (50% of plants with heads)					horizontal									
Flag Leaf: Attitude of Blade					medium									
Spikelet: Pubescence of Lemma					purple									
Lemma: Anthocyanin Coloration of Apex (Early Observation)	white	white	white	white				white				white		yellow
Spikelet: Color of Stigma (Stage 65)			very short	very long										
Non prostrate varieties only: Stem Length		absent	absent				present							
Stem: Anthocyanin Coloration of Node (Stage 70)							tip only	upper quarter only			Upper Half Only			
Panicle: Distribution of Awns		none	none											
Panicle: Length of Main Axis (Stage 72-90)	medium	medium		medium	medium							medium		
Panicle: Attitude in relation to Stem (Stage 90)														
Flag Leaf: Attitude of Blade (Late Observation)														
Panicle: Attitude of Branches (Stage 90)						semi-erect								
Decorticated grain: Length			long							short				
Decorticated grain: Shape		Round				Half-Spindle-Shaped						Long spindle-shaped		spindle-shaped
Decorticated Grain: Color	white	white				Dark Purple/Black	light red	Variegated Brown	white	absent or weak	Red			light brown
Decorticated Grain: Aroma														

Summary

Region	Number of varieties with predominant and distinct states of expression For all traits	List of varieties identified	States of expression not covered by identified varieties
East Asia	25	PSB RC 70, PSB RC 92, NSIC RC 112, NSIC RC 106, PSB RC 50, DV 85, IR 55423-01, CHIANUNG SEN YU 23, IR 25976-12-2-2-1-1, IR 44, IR 54, IR 24, IR 42, IR 48, IR 65185-3B-8-3-2, ESHWERKORRA, IR 58, W 1240, K 39-96-1-1-1-2, IR 61979-138-1-3-2-3, IR 73885-1-4-3-2-1-6, N22, SINA SIVAPPU, IR 65, PSB RC 96	10
South Asia	41	IR 61608-3B-20-2-2-1, FR 13 A, ARC 11554, IR 59552-21-3-2-2, MATATAG 3, PSB RC 96, DV 85, MATATAG 2, NSIC RC 106, NSIC RC 112, PSB RC 52, PSB RC 70, PSB RC 88, SINNA SIVAPPU, IR 36, IR 38, IR 50, IR 59682-132-1-1-2, IR 64, IR 68, IR 71606-1-1-4-2-3-1-2, PSB RC 30, PSB RC 4, PSB RC 9, PSB RC 94, W 1240, IR 29, IR 48, IR 61979-138-1-3-2-3, PSB RC 102, PSB RC 60, PSB RC 92, ESHWERKORRA, IR 43, IR 58, IR 65185-2-B-8-3-2, IR 72, K 39-96-1-1-1-2, BPI 76 (NS), IR 22, IR 40	6
Southeast Asia	35	IR 61608-3B-20-2-2-1, IR 59552-21-3-2-2, PSB RC 50, MATATAG 2, MATATAG 1, NSIC RC 110, NSIC RC 112, PSB RC 102, MATATAG 3, PSB RC 52, PSB RC 96, NSIC RC 106, ARC 11554, IR 52713-2B-1-2, PSB RC 88, PSB RC 94, FR 13 A, IR 62141-114-3-2-2-2, N22, PSB RC 5, W 1240, IR 43, IR 55423-01, IR 61979-138-1-3-2-3, IR 9202-25-1-3, BPI 76 (NS), DV 85, ESHWERKORRA, K 39-96-1-1-1-2, IR 30, IR 65185-2-b-8-3-2, SINNA SIVAPPU, PSB RC 54, PSB RC 92, PSB RC 28	6

*Out of 17 traits and 68 states of expressions



Conclusions/Recommendations

- Different sets of potential example varieties identified for target regions
- Still need to identify varieties with distinct states of expression for East, South and Southeast Asia for some asterisked traits
- TWA feedback on need to continue INEVDUST
- NARES feedback at the INGER TAC



Trait	State	East Asia	South Asia	Southeast Asia
Leaf Anthocyanin Coloration of Auricle (Early-Boot Stage)	Absent	✓	✓	✓
	Present	✓	✓	✓
Time of Heading (50% of plants with heads)	Very Early	✓	✓	✓
	Early	✓	✓	✓
	Medium	✓	✓	✓
	Late	✓	✓	✓
Flag Leaf: Attitude of Blade	Erect	✓	✓	✓
	Semi-erect	✓	✓	✓
	Horizontal	✓	✓	✓
	Recurved	✓	✓	✓
Spikelet: Pubescence of Lemma	Absent or Very Weak	✓	✓	✓
	Weak	✓	✓	✓
	Medium	✓	✓	✓
	Strong	✓	✓	✓
	Very Strong	✓	✓	✓
Lemma: Anthocyanin Coloration of Apex (Early Observation)	Absent or Very Weak	✓	✓	✓
	Weak	✓	✓	✓
	Medium	✓	✓	✓
	Strong	✓	✓	✓
	Very Strong	✓	✓	✓
Spikelet: Color of Stigma (Stage 96)	White	✓	✓	✓
	Light Green	✓	✓	✓
	Yellow	✓	✓	✓
	Light Purple	✓	✓	✓
	Purple	✓	✓	✓

Trait	State	East Asia	South Asia	Southeast Asia
Non prostrate varieties only: Stem Length	Very Short	✓	✓	✓
	Short	✓	✓	✓
	Medium	✓	✓	✓
	Long	✓	✓	✓
	Very Long	✓	✓	✓
Stem: Anthocyanin Coloration of Nodes (Stage 70)	Absent	✓	✓	✓
	Present	✓	✓	✓
Panicle: Distribution of Awns	Tip only	✓	✓	✓
	Upper Quarter Only	✓	✓	✓
	Upper Half Only	✓	✓	✓
	Upper Three Quarters Only	✓	✓	✓
	Whole Length	✓	✓	✓
Panicle: Length of Main Axis (Stage 72-80)	Short	✓	✓	✓
	Medium	✓	✓	✓
	Long	✓	✓	✓
Panicle: Attitude in relation to Stem (Stage 90)	Upright	✓	✓	✓
	Semi-upright	✓	✓	✓
	Slightly Drooping	✓	✓	✓
	Strongly Drooping	✓	✓	✓
Flag Leaf: Attitude of Blade (Late Observation)	Erect	✓	✓	✓
	Semi-erect	✓	✓	✓
	Horizontal	✓	✓	✓
	Recurved	✓	✓	✓

Legend:
 ✓ = with distinct trait
 * = without distinct trait



Trait	State	East Asia	South Asia	Southeast Asia
Panicle: Attitude of Branches (Stage 80)	Erect	✓	✓	✓
	Semi-erect	✓	✓	✓
	Spreading	✓	✓	✓
Deorloated grain: Length	Short	✓	✓	✓
	Medium	✓	✓	✓
	Long	✓	✓	✓
Deorloated grain: Shape	Round	✓	✓	✓
	Semi-round	✓	✓	✓
	Half-spindle-shaped	✓	✓	✓
	Spindle-shaped	✓	✓	✓
	Long spindle-shaped	✓	✓	✓
Deorloated Grain: Color	White	✓	✓	✓
	Light Brown	✓	✓	✓
	Variegated Brown	✗	✓	✓
	Dark Brown	✗	✓	✓
	Light Red	✗	✓	✓
	Red	✗	✓	✓
	Variegated Purple	✗	✗	✓
	Purple	✗	✗	✓
	Dark Purple/Black	✗	✗	✓
Deorloated Grain: Aroma	Absent or Weak	✗	✓	✓
	Weak	✗	✓	✓
	Strong	✗	✓	✓

Legend:
 ✓ = with selected trait
 ✗ = without selected trait



