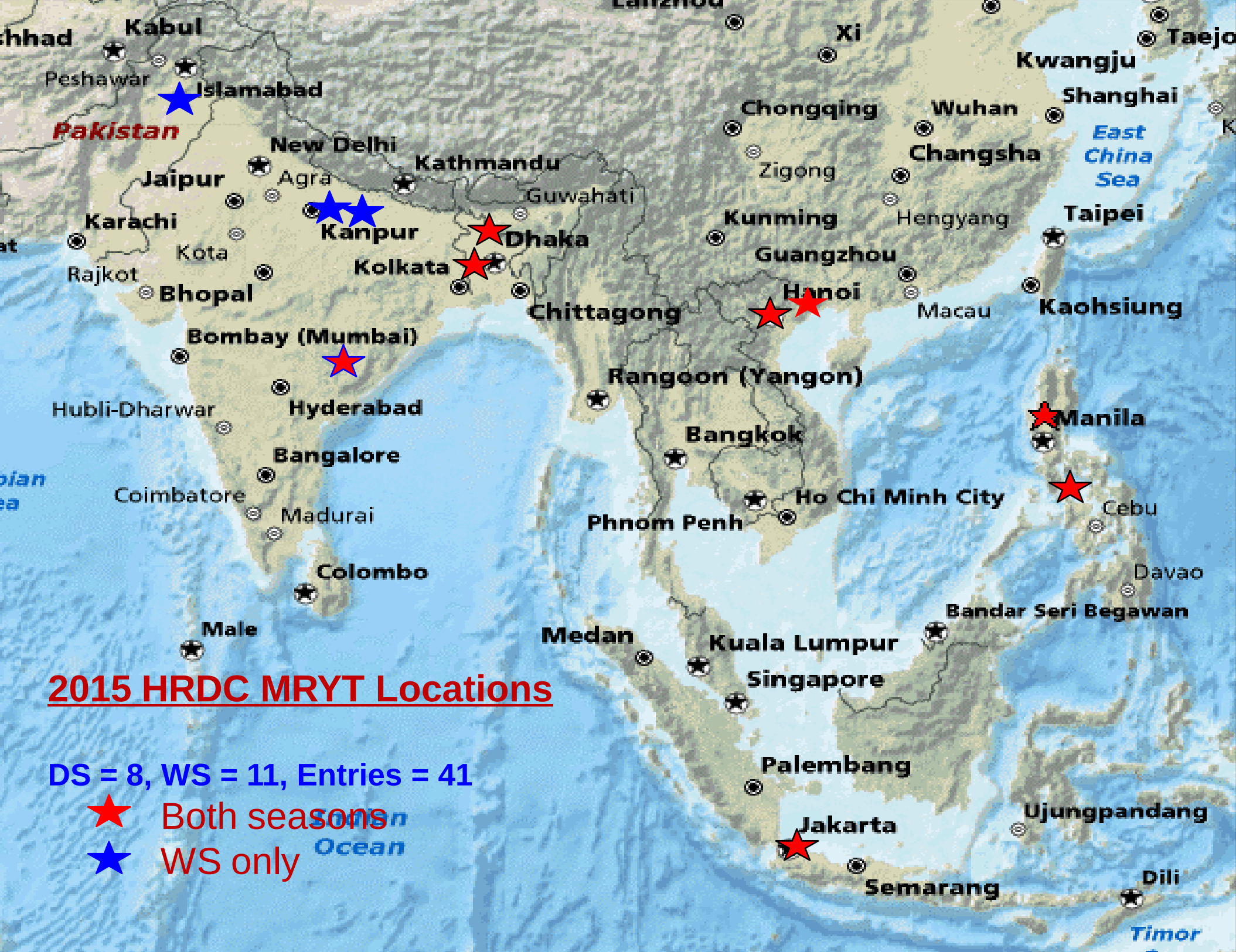
Kabul
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Islamabad
Pakistan
New Delhi
Kathmandu
Jaipur
Agra
Karachi
Kanpur
Dhaka
Kota
Kolkata
Rajkot
Bhopal
Chittagong
Bombay (Mumbai)
Hubli-Dharwar
Hyderabad
Bangalore
Coimbatore
Madurai
Colombo
Male
Rangoon (Yangon)
Bangkok
Phnom Penh
Ho Chi Minh City
Medan
Kuala Lumpur
Singapore
Palembang
Jakarta
Semarang
Ujungpandang
Dili
Timor
Indian Ocean
Xi
Chongqing
Wuhan
Changsha
Zigong
Guwahati
Kunming
Hengyang
Guangzhou
Hanoi
Macau
Taipei
Kaohsiung
Manila
Cebu
Davao
Bandar Seri Begawan
Kwangju
Shanghai
East China Sea
2015 HRDC MRYT Locations
DS = 8, WS = 11, Entries = 41
Both seasons
WS only

2015 HRDC MRYT Site

2015 HRDC MRYT Locations

#	Site	COUNTRY	Sponsor	DS		WS		Latitude	Longitude
				R^2	CV%	R^2	CV%		
1	Kaku	Pakistan	RRI			0.93	6.9	31^0 4' N	74^0 2' E
2	Faizabad	India	Advanta			0.94	3.9	26^0 8' N	82^0 2' E
3	Lucknow	India	Nuziveedu			0.67	15.6	26^0 5' N	80^0 6' E
4	Pabna	Bangladesh	BRAC	0.69	5.7	0.73	4.9	24^0 0' N	89^0 2' E
5	Gazipur	Bangladesh	BRAC	0.81	4.9	0.74	9.2	23^0 6' N	90^0 3' E
6	Raipur	India	JK Agri	0.74	9.7	0.80	8.2	21^0 2' N	81^0 6' E
7	Hanoi	Vietnam	FCRI	0.92	5.1	0.85	6.2	20^0 9' N	105^0 8' E
8	HaiDuang	Vietnam	Bioseed	0.97	3.5	0.81	9.4	20^0 6' N	106^0 2' E
9	Nueva Ecija	Philippines	PhilRice	0.51	13.9	Typhoon Damaged		15^0 7' N	120^0 9' E
10	Los Baños	Philippines	IRRI	0.71	7.2	0.61	16.0	14^0 2' N	121^0 3' E
11	Sukamandi	Indonesia	ICRR	0.53	14.1	Pending		6^0 7' S	107^0 6' E
			Total Sites	***8***		***11***			

Thanks to the Site Sponsors for Services to Other HRDC Members !

ANOVA for Hybrid Yield over Seasons

Season	Yield	t Test	N	Maturity
DS	7338	A	903	129
WS	5741	B	971	118

ANOVA for Hybrid Yield over Sites

(2015 HRDC MRYT)

Site	Country	Yield	t Test	N	Season	Maturity
NuevaEcija	Philippines	10053	A	120	DS	117
Faizabad	India	8415	B	120	WS	130
LosBanos	Philippines	7070	C	237	DS + WS	118
Sukamandi	Indonesia	6955	C	120	DS	112
Pabna	Bangladesh	6331	D	240	DS + WS	132
Gazipur	Bangladesh	6216	DE	240	DS + WS	117
Raipur	India	6134	E	226	DS + WS	118
HaiDuong	Vietnam	5484	F	171	DS + WS	
Hanoi	Vietnam	5436	FG	240	DS + WS	126
Lucknow	India	5297	G	80	WS	
Kala Shah Kaku	Pakistan	5134	H	80	WS	

ANOVA for Hybrid Yield on Hybrid (both seasons)

Entry	Yield	> Inbred CK %	> Hybrid CK %	t Test	N	Note
HRDC1511	7159	26.8	14.0	A	49	CNRRI
HRDC1531	7100	25.8	13.0	A	48	LPHT
HRDC1519	6975	23.5	11.1	AB	48	JK Agri
HRDC1530	6897	22.2	9.8	ABC	49	LPHT
HRDC1517	6805	20.5	8.3	BCD	49	JK Agri
IR96408H	6796	20.4	8.2	BCDE	49	IRRI
HRDC1529	6795	20.4	8.2	BCDE	48	
HRDC1515	6791	20.3	8.1	BCDE	48	
HRDC1526	6787	20.2	8.0	BCDE	49	
HRDC1506	6721	19.0	7.0	BCDEF	45	
HRDC1528	6694	18.6	6.6	BCDEFG	49	
IR107812H	6692	18.5	6.5	BCDEFG	43	
IR107808H	6675	18.2	6.3	BCDEFGH	49	
HRDC1525	6600	16.9	5.1	CDEFGH	46	
HRDC1516	6595	16.8	5.0	CDEFGHI	49	
IR107807H	6591	16.7	4.9	CDEFGHI	43	
HRDC1501	6572	16.4	4.6	DEFGHI	49	
HRDC1509	6514	15.4	3.7	DEFGHIJ	47	
IR107810H	6498	15.1	3.5	DEFGHIJK	43	
HRDC1508	6494	15.0	3.4	DEFGHIJK	46	
HRDC1520	6488	14.9	3.3	EFGHIJK	43	
HRDC1507	6464	14.5	2.9	FGHIJK	46	
IR94398H	6440	14.1	2.5	FGHIJK	48	
HRDC1522	6439	14.1	2.5	FGHIJK	49	
HRDC1502	6439	14.0	2.5	FGHIJK	46	
HRDC1505	6398	13.3	1.9	GHIJK	49	
HRDC1513	6375	12.9	1.5	HIJK	45	
HRDC1527	6370	12.8	1.4	HIJK	46	
HRDC1518	6362	12.7	1.3	HIJK	46	
HRDC1523	6361	12.7	1.3	HIJK	46	
IR75217H	6281	11.2	0	IJKL	49	
HRDC1504	6281	11.2	0.0	IJKL	45	
IR107805H	6230	10.3	-0.8	JKL	46	
HRDC1521	6222	10.2	-0.9	JKL	46	
HRDC1512	6213	10.0	-1.1	JKL	49	
HRDC1503	6210	10.0	-1.1	JKL	48	
HRDC1524	6193	9.7	-1.4	KL	46	
HRDC1510	6052	7.2	-3.7	L	49	
IR107806H	5762	2.1	-8.3	M	44	
PSBRc82	5646	0	-10.1	M	39	

MEAN	*6511*
R^2	*0.92*
CV%	*9.67*

2015DS MRYT Yields across Locations

Site	Yield	t Test	N	Maturity
NuevaEcija	10,053	A	120	117
LosBanos	9,024	B	117	120
Pabna	7,283	C	120	143
Sukamandi	6,955	D	120	112
Gazipur	6,728	E	120	144
HaiDuong	6,275	F	66	137
Hanoi	6,187	F	120	143
Raipur	5,766	G	120	

2015DS MRYT Yields by Hybrid

Entry	Yield	> Inbred CK %	> Hybrid CK %	t Test	N	Note
HRDC1511	8,226	32.0	12.9	A	24	CNRRI
HRDC1531	8,222	31.9	12.9	A	24	LPHT
HRDC1530	8,088	29.8	11.0	AB	24	LPHT
IR107805H	7,916	27.0	8.7	ABC	21	IRRI
HRDC1519	7,897	26.7	8.4	ABC	24	Pan Seeds
HRDC1506	7,863	26.2	7.9	ABCD	21	
IR107810H	7,669	23.0	5.3	BCDE	21	
HRDC1517	7,612	22.1	4.5	BCDEF	24	
HRDC1515	7,601	22.0	4.3	BCDEFG	24	
IR96408H	7,589	21.8	4.2	CDEFG	24	
IR107808H	7,509	20.5	3.1	CDEFGH	24	
HRDC1529	7,492	20.2	2.8	CDEFGH	24	
IR107807H	7,457	19.6	2.4	CDEFGH	21	
HRDC1526	7,383	18.5	1.4	DEFGHI	24	
HRDC1525	7,373	18.3	1.2	DEFGHI	21	
IR107812H	7,347	17.9	0.8	EFGHI	21	
HRDC1501	7,345	17.8	0.8	EFGHI	24	
HRDC1524	7,312	17.3	0.4	EFGHIJ	21	
HRDC1528	7,304	17.2	0.3	EFGHIJ	24	
IR75217H	7,285	16.9	0.0	EFGHIJ	24	
HRDC1513	7,272	16.7	-0.2	EFGHIJ	21	
HRDC1504	7,239	16.1	-0.6	EFGHIJ	21	
HRDC1527	7,226	15.9	-0.8	EFGHIJ	21	
HRDC1508	7,217	15.8	-0.9	EFGHIJ	21	
HRDC1520	7,216	15.8	-0.9	EFGHIJ	21	
HRDC1516	7,173	15.1	-1.5	EFGHIJ	24	
IR94398H	7,164	14.9	-1.7	EFGHIJ	24	
HRDC1523	7,117	14.2	-2.3	FGHIJ	21	
HRDC1518	7,116	14.2	-2.3	FGHIJ	21	
HRDC1503	7,077	13.5	-2.9	FGHIJ	24	
HRDC1509	7,065	13.4	-3.0	GHIJ	24	
HRDC1507	7,019	12.6	-3.7	HIJK	21	
HRDC1512	7,009	12.4	-3.8	HIJK	24	
HRDC1505	6,998	12.3	-3.9	HIJK	24	
HRDC1510	6,980	12.0	-4.2	HIJK	24	
HRDC1522	6,971	11.8	-4.3	HIJK	24	
HRDC1521	6,889	10.5	-5.4	IJK	21	
HRDC1502	6,806	9.2	-6.6	JK	21	
IR107806H	6,556	5.2	-10.0	KL	24	
PSBRc82	6,233	0.0	-14.4	L	15	

MEAN	7338
R^2	0.89
CV%	9.90

2015WS MRYT Yields across Locations

Site	Yield	t Test *	N	Maturity
Faizabad	8415	A	120	
Gazipur	5704	C	120	115
HaiDuong	4986	F	105	113
Hanoi	4685	G	120	120
KalaShah	5134	E	80	
LosBanos	5165	E	120	117
Lucknow	5232	E	120	
Pabna	5380	D	120	121
Raipur	6551	B	106	118

2015WS MRYT Yields by Hybrid

Entry	Yield	> Inbred CK %	> Hybrid CK %	t Test	N	Note
HRDC1526	6195	18.6	6.0	A	26	Ankur
HRDC1502	6145	17.7	5.1	AB	26	Bisco
HRDC1529	6118	17.1	4.7	AB	25	Sichuan AAS
IR94398H	6106	16.9	4.4	AB	26	IRRI
HRDC1511	6096	16.7	4.3	AB	26	CNRRI
HRDC1528	6087	16.5	4.1	ABC	26	
HRDC1519	6038	15.6	3.3	ABCD	25	
IR107812H	6023	15.3	3.0	ABCDE	23	
HRDC1517	6001	14.9	2.6	ABCDEF	26	
HRDC1516	5999	14.8	2.6	ABCDEF	26	
HRDC1515	5954	14.0	1.8	ABCDEFG	25	
HRDC1507	5951	13.9	1.8	ABCDEFG	26	
HRDC1525	5920	13.3	1.3	ABCDEFG	26	
HRDC1531	5910	13.1	1.1	ABCDEFGH	25	
HRDC1509	5905	13.1	1.0	ABCDEFGH	24	
HRDC1522	5889	12.8	0.7	ABCDEFGH	26	
HRDC1501	5880	12.6	0.6	ABCDEFGH	26	
IR75217H	5846	11.9	0.0	ABCDEFGH	26	
HRDC1508	5843	11.9	-0.1	ABCDEFGH	26	
HRDC1505	5824	11.5	-0.4	BCDEFGH	26	
HRDC1520	5741	9.9	-1.8	CDEFGHI	23	
IR107810H	5739	9.9	-1.8	CDEFGHI	25	
HRDC1523	5712	9.4	-2.3	DEFGHI	26	
HRDC1518	5710	9.3	-2.3	DEFGHI	26	
IR107808H	5701	9.1	-2.5	DEFGHI	23	
HRDC1530	5684	8.8	-2.8	DEFGHI	26	
HRDC1506	5681	8.8	-2.8	EFGHI	25	
HRDC1521	5654	8.3	-3.3	FGHI	26	
HRDC1527	5633	7.8	-3.6	GHIJ	26	
HRDC1513	5559	6.4	-4.9	HIJK	25	
HRDC1504	5458	4.5	-6.6	IJKL	25	
HRDC1512	5410	3.6	-7.5	IJKLM	26	
IR107806H	5330	2.0	-8.8	JKLM	23	
HRDC1503	5296	1.4	-9.4	KLM	25	
IR96408H	5265	0.8	-9.9	KLM	26	
PSBRc82	5223	0.0	-10.7	LM	25	
HRDC1524	5212	-0.2	-10.8	LM	26	
HRDC1510	5101	-2.3	-12.7	MN	26	
IR107807H	4853	-7.1	-17.0	NO	26	
IR107805H	4742	-9.2	-18.9	O	21	

MEAN	5715
R2	0.92
CV%	8.99

More Data ……

(Agronomic and Grain Quality)

http://hrdc.irri.org

2015 HRDC MRYT Locations					
		DS		WS	
#	Site	R^2	CV%	R^2	CV%
1	Kaku			0.93	6.93
2	Faizabad			0.94	3.85
3	Lucknow			0.67	15.59
4	Pabna	0.69	5.69	0.73	4.89
5	Gazipur	0.81	4.85	0.74	9.15
6	Raipur	0.74	9.69	0.80	8.19
7	Hanoi	0.92	5.10	0.85	6.15
8	HaiDuang	0.97	3.53	0.81	9.38
9	Nueva Ecija	0.51	13.88		
10	Los Baños	0.71	7.17	0.61	16.03
11	Sukamandi	0.53	14.06		

Experiments were much improved :

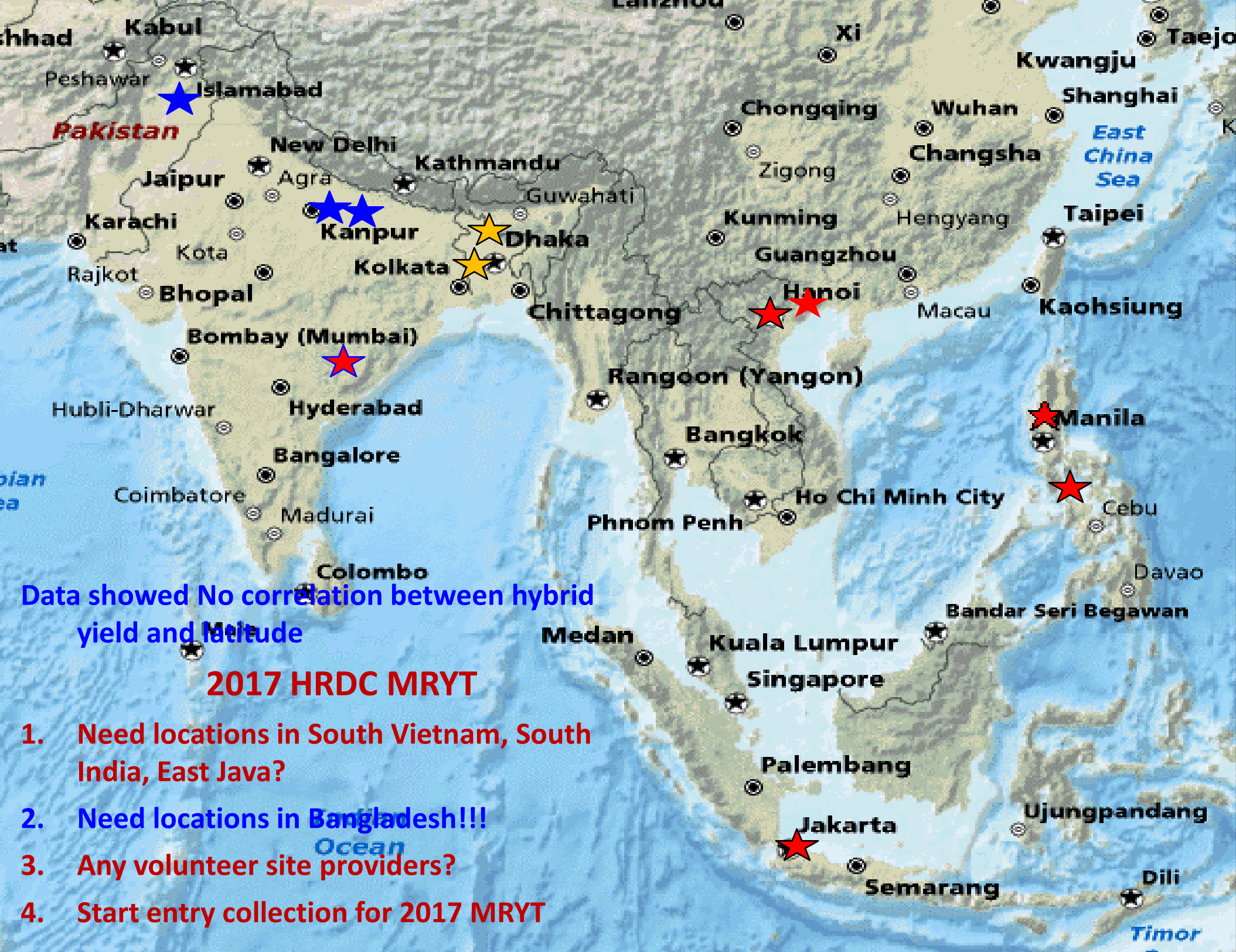
High R^2 and Low CV% without location discarded (>20%)

Hybrid Yield Difference between Seasons				
	DS	WS	DS - WS	DS > WS %
	All Hybrids			
Mean Yield (kg/ha)	7338	5715	1623	28.4
> Inbred CK %	17.5	9.3	8.2	
	Top 5 High-yielding Hybrids			
Mean Yield (kg/ha)	8275	6132	2143	34.9
> Inbred CK %	32.8	17.4	15.4	

1. **Yield: DS yield much higher than WS**
   1) Difference for all hybrids: 1623 kg/ha
   2) Difference for top 5-high-yielding hybrids: 2143 kg/ha
2. **Yield heterosis: DS is significantly higher than WS**
   1) All hybrids: 17.5 vs 9.3 %
   2) Top 5 high-yielding hybrids: 32.8 vs 17.4%
   3) ***Is it the time to focus more on development of hybrids for WS***?
      a) Research for causes of low-yielding & heterosis in WS – physiologic & agronomic traits, field management
      b) Traits required for increasing hybrid yield & heterosis in WS

Entry	Yield	> Inbred CK %	> Hybrid CK %	t Test	N	Note
Yield of Top 5 High-Yielding Hybrids (2015DS)						
HRDC1511	8,226	32.0	12.9	A	24	CNRRI
HRDC1531	8,222	31.9	12.9	A	24	LPHT
HRDC1530	8,088	29.8	11.0	AB	24	LPHT
IR107805H	7,916	27.0	8.7	ABC	21	IRRI
HRDC1519	7,897	26.7	8.4	ABC	24	Pan Seeds
Yield of Top 5 High-Yielding Hybrids (2015WS)						
HRDC1526	6195	18.6	6.0	A	26	Ankur
HRDC1502	6145	17.7	5.1	AB	26	Bisco
HRDC1529	6118	17.1	4.7	AB	25	Sichuan AAS
IR94398H	6106	16.9	4.4	AB	26	IRRI
HRDC1511	6096	16.7	4.3	AB	26	CNRRI

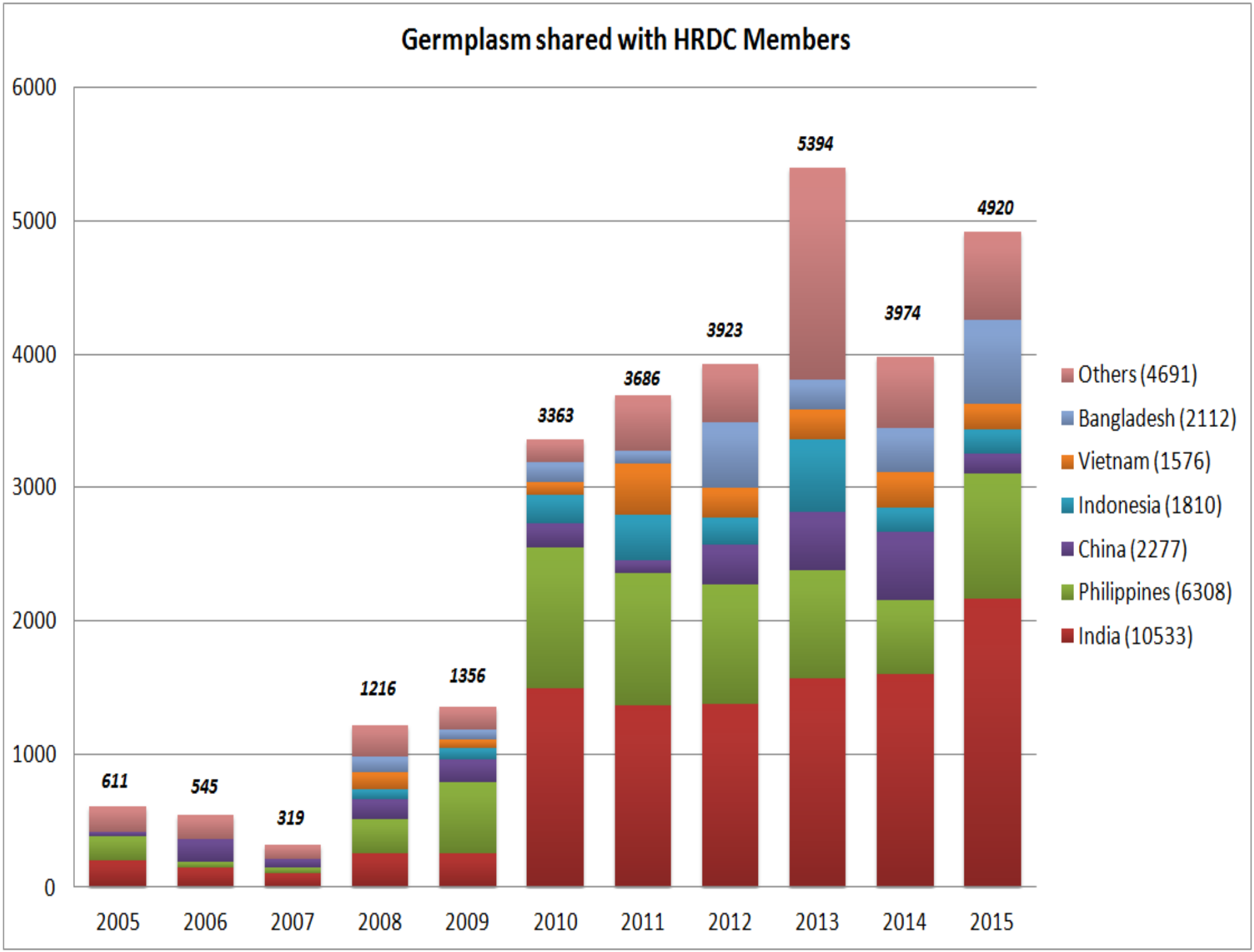
1. Chinese hybrids yield higher than the averaged hybrids in DS – Why & Traits?
2. Less Chinese hybrids in the top high-yielding list in **WS** – not adapted to WS?



Data showed No correlation between hybrid yield and latitude

2017 HRDC MRYT

1. Need locations in South Vietnam, South India, East Java?
2. Need locations in Bangladesh!!!
3. Any volunteer site providers?
4. Start entry collection for 2017 MRYT


Germplasm shared with HRDC Members
6000
5000
4000
3000
2000
1000
0
611
545
319
1216
1356
3363
3686
3923
5394
3974
4920
2005
2006
2007
2008
2009
2010
2011
2012
2013
2014
2015
Others (4691)
Bangladesh (2112)
Vietnam (1576)
Indonesia (1810)
China (2277)
Philippines (6308)
India (10533)

Summary of IRRI Rice Hybrids (Mestiso) Released or Release-pending in the Philippines									
Name	Mestiso 25	Mestiso 26	Mestiso 30	Mestiso 31	Mestiso 32	Mestiso 56	Mestiso 61	Mestiso 68	IR82386H
Average (kg/ha)	6711	6740	6574	6357	6136	6489	6442	6632	6507
> PSBRC 82 (kg/ha)	548	505	644	425	310	346	658	490	440
> PSBRC 82 (%)	8.9	8.1	10.9	7.2	5.3	5.6	11.4	8	7.2
Data point	95	95	67	91	69	84	100	108	117
Maturity (d)	112	115	111	111	110	113	110	113	114
Total Milling (%)	67.2	67.8	68.2	67.3	66.9	66.9	69.3	66.3	67.3
Head Rice (%)	48.8	50.5	45.5	49	48.5	47.1	54.9	45.7	46.9
Chalkiness (%)	16.3	15.9	9.3	20.9	17	15.8	12.1	7.9	16.9
Amylose (%)	24.9	23.9	20.1	23.1	23.9	24.5	21.9	24.5	24.2
Grain Length (mm)	7.00	6.82	6.88	6.88	6.96	6.75	6.92	6.86	6.94
Grain Width (mm)	2.02	1.97	2.12	2.20	2.29	2.26	1.98	1.94	2.01
Year Released	2010	2010	2011	2011	2011	2014	2014	2015	Pending
IP	IRRI-PhilRice Joint							IRRI Sole	IRRI-PhilRice

IRRI New and Promising Hybrids Tested with data points > 10							
Name	IR 90875H	IR 96408H	IR 107808H	IR 107812H	IR 106638H	IR 96441H	IR 90872H
Average Yield (kg/ha)	7677	7205	6831	6866	7675	7440	7145
> PSBRC 82 (kg/ha)	872	825	809	665	985	665	633
Yield Advantage (%)	12.8	12.9	13.4	10.7	14.7	9.8	9.7
Tested in Season/Year/Environment	6/4/9	4/3/17	4/2/12	4/2/11	5/4/6	8/4/20	7/4/28
Data Point	22	22	14	13	12	25	30
% of Wins over PSBRC 82	81	90	85	75	91	79	83
Maturity (d)	121	122	123	123	120	120	124
Total Milling (%)	67.7	63.9	67.5	66.9	68.2	65.0	64.9
Head Rice (%)	49.3	40.1	48.5	46.0	46.0	36.6	48.2
Chalkiness (%)	6.0	5.8	13.4	9.4	12.6	11.1	8.5
Amylose (%)	23.6	23.1	22.4	24.5	21.0	22.8	25.4
Grain Length (mm)	6.7	7.1	7.0	6.9	6.9	6.9	6.6
Grain Width (mm)	2.1	2.2	2.3	2.2	2.1	2.0	2.1
Licensing Option	Further Testing + Limited Exclusive or Non-exclusive Licensing						

Please visit 2016DS hybrid rice yield trials at Los Banos

1. **Select what hybrids you like & Question us for more data**
2. **Request sample seeds for further testing, and licensing possibility**

Progress made for IRRI new rice hybrids

Comparison of IRRI Released Mestio Hybrids and New Promising Hybrids			
	Mestiso	New Hybrids	Difference
Average Yield (kg/ha)	6510	7263	753
> PSBRC 82 (kg/ha)	485	779	294
> PSBRC 82 (%)	8.1	12.0	3.9

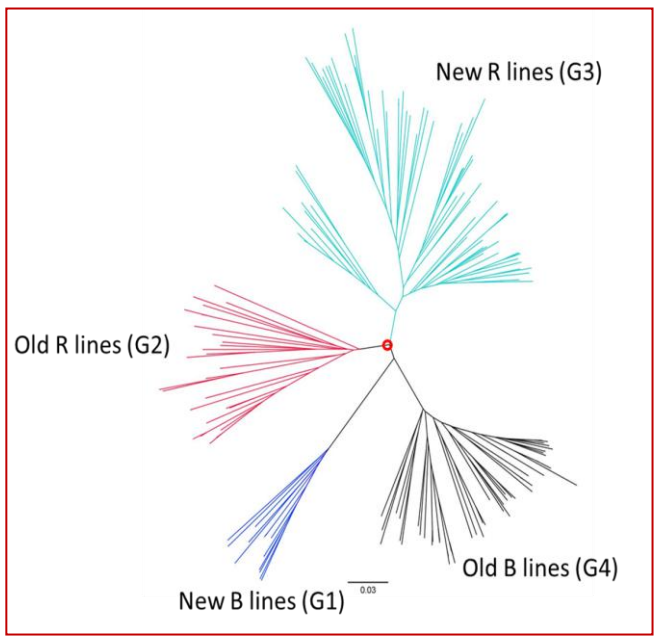
2015WS Hyderabad IRRI Hybrid Rice Yield Trial

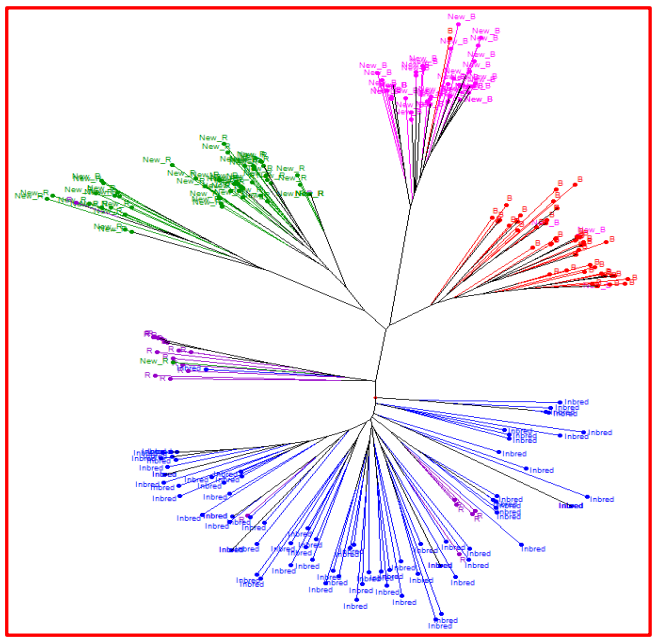
Entry	Yield	> INBRED %	>IR75217H %		DTH	Whole %	Head %
H6444GOLD	7,227	50.4	32.4	A	102	70.4	57.1
IRRI2015H-18	6,686	39.2	22.5	AB	92	67.9	56.4
IRRI2015H-12	6,282	30.8	15.1	ABC	88	62.9	48.8
IRRI2015H-19	6,203	29.1	13.7	ABCD	91	71.8	60.7
IRRI2015H-13	6,055	26.0	10.9	ABCDE	82	71.4	55.0
IRRI2015H-20	6,013	25.2	10.2	ABCDE	81	70.4	56.8
IRRI2015H-3	5,920	23.2	8.5	BCDE	85	68.0	51.4
IRRI2015H-17	5,458	13.6	0.0	BCDEF	86	73.2	60.7
IRRI2015H-9	5,416	12.7	-0.8	CDEF	78	70.4	59.6
IRRI2015H-10	5,373	11.9	-1.6	CDEFG	86	69.6	53.2
IRRI2015H-2	5,338	11.1	-2.2	CDEFG	84	70.7	60.4
IRRI2015H-7	5,266	9.6	-3.5	CDEFG	78	70.7	56.8
IRRI2015H-6	5,147	7.1	-5.7	CDEFG	75	70.9	59.3
IRRI2015H-11	4,993	3.9	-8.5	DEFGH	88	70.0	57.5
IRRI2015H-14	4,898	2.0	-10.3	EFGH	87	71.1	58.2
IRRI2015H-1	4,824	0.4	-11.6	EFGH	88	73.2	58.9
IRRI2015H-4	4,814	0.2	-11.8	EFGH	88	71.4	58.9
IRRI-154	4,804	0.0	-12.0	EFGH	85		
IRRI2015H-8	4,655	-3.1	-14.7	FGH	88	71.1	59.6
H6129GOLD	4,612	-4.0	-15.5	FGH	92	73.9	54.6
IRRI2015H-5	4,436	-7.7	-18.7	FGH	97	71.1	54.3
IRRI2015H-16	4,257	-11.4	-22.0	FGH	98	69.3	58.6
IRRI2015H-15	4,130	-14.0	-24.3	GH	85	71.1	56.8
MTU1010	3,795	-21.0	-30.5	H	89		

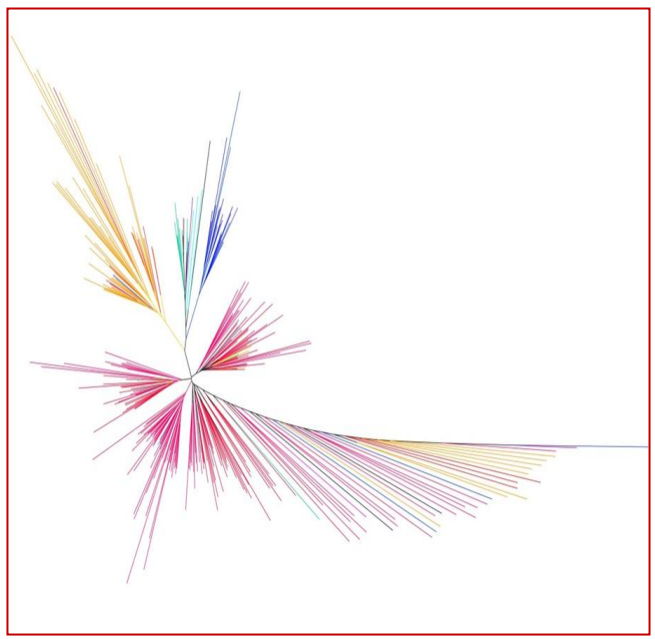
MEAN	5,275
R2	0.73
CV%	14.49
LSD	1,256

On-going studies of tropical heterotic groups

1. **Molecular Profile + Field Evaluation**
2. **Difference (molecular and phenotypic) of yield heterosis for germplasm before and after 2005**
3. **Heterosis of hybrid rice germplasm between PhilRice and IRRI**
4. **<u>Heterotic groups using 3k germplasm</u>**
5. **Talk to us for how to collaborate**








Thanks to the Team Members
Special Personal Thanks to:
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