

Serious Objections to Biosafety Trials of DMH-11 with special reference to Agronomic Data

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Reported higher than actual MSY of DMH-11 (Kg/ha)

Trial	Location	Reported by DRMR ¹	Reported by Developer ²	Comments
BRL-I, 1st Year (2010-11)	Kumher	2285	2285	
	Alwar	2516	2515	
	SGnagar	3000	3000	
	Average	2600	2600	
BRL-I, 2nd Year (2011-12)	Kumher	2892	3332	Developer reported 15.2% higher than actually obtained yield for all cultivars in this year trials*
	Alwar	3157	3638	
	Average	3024	3485	
BRL-II (2014-15)	Delhi	1879	1879	
	Bhatinda	2734	2734	
	Ludhiana	2543	2543	
	Average	2385	2386	Overall Yield Increase of 7.5% notched up!
Actual Average of 8 Trials		2626		
Average of Average			2824	

Ref : 1) BRL Trial Reports 2) Bio safety summary Report to GEAC

Low Yielder Checks used in Zone II

Check	No. of years of testing	No. of Trials	MSY (Kg/ha)	Note
National Check				
Varuna (Used under BRL)	5	28	1907	Compared with 15% low yielder. Varuna was abandoned as NC before BRL testing started.
Kranti (Recommended and used under AICRP)	11	67	2245	
Zonal Check				
RL-1359 (Used under BRL)	7	41	2291	Compared with 1.3 % and 10.3% low yielder
NRCDR-2 (Recommended and used under AICRP)	5	32	2321	
RH-749 (Recommended under AICRP trials) (Variety Trials data)	3	20	2553	
Ref: AICRP data for IHT and AHT Trials				

Low Yielder Checks used in Zone III

Check	No. of years of testing	No. of Trials	MSY (Kg/ha)	Note
National Check				
Varuna (Used under BRL)	5	38	1646	Compared with 10% low yielder.
Kranti (Recommended and used under AICRP)	11	79	1834	
Zonal Check				
Maya (Used under BRL)	5	38	1814	Compared with 9.8% low yielder.
RGN-73 (Recommended and used under AICRP)	6	34	2012	

Ref: AICRP data for IHT and AHT Trials

False claims of “proper checks”

GEAC should tell the nation, which out of 8 trials is conducted with proper check?

1. DMH-11, being a hybrid, must be compared with hybrid as per standard protocol. As per the data presented, **hybrid is never used** for comparison during any of the trials.
2. During BRL trials, comparisons in both the zones for all three years were done with variety, which **is neither a zonal check nor a national check** as recommended by AICRP-RM for Hybrid Trials.
3. GEAC and developer's claim that “national check is used” is **untrue**.
4. BRL trials **violate the protocol as well as conditions** for Permission.
5. Without using proper comparators, claims of **yield gains are scientifically not valid**.

A billion dollar question

Why hybrid was removed from comparison in BRL trials?

- During non-BRL trials in 2006-07 DMH-1 (Non-transgenic Hybrid) out yielded **3 out of 4** locations in Zone II and **3 out of 5** locations in Zone III. **Even Mean of earlier hybrid is also higher** in both the Zones.

:Worth to note:

- Hybrids **were removed as comparators** from all subsequent DMH-11 (BRL) trials, even though it is used in other hybrid trials. **WHY?**

DMH-11 compared with existing Varieties (Zone III)

Cultivar	Year of Trials	Number of trial years	Number of Trials	MSY (Kg/ha)	% Difference in MSY of DMH-11 over respective cultivar
Varieties (MSY based on AICRP trials)					
RH-749	2009-10, 2013-14, 2014-15	3	14	1851	39.9
DRMRIJ-31	2010-11	1	6	2322	11.5
NRCDR-2	2003-04, 2004-05	2	12	2106	22.9
Transgenic Hybrid (MSY based on BRL trials)					
DMH-11 (Only BRL Trials)	2010-11, 2011-12	2	2	2589	

Comments:

1. Yield advantage of DMH 11 over existing varieties is considerably high, but the data of MSY of DMH-11 is just from one location-Kumher

Ref: AICRP Reports and BRL Reports

DMH-11 compared with existing Hybrids (Zone III)

Cultivar	Year of Trials	Number of trial years	Number of Trials	MSY (Kg/ha)	% Difference in MSY of DMH-11 over respective cultivar
Hybrids (MSY based on AICRP trials)					
DMH-1	2004-05, 2007-08 to 2014-15	9	48	2074	24.8
NRCHB-506	2005-06, 2006-07, 2009-10 to 2014-15	8	41	2010	28.8
CORAL -437	2006-07 to 2008-09	3	17	1900	36.3
Transgenic Hybrid (MSY based on BRL trials)					
DMH-11 (Only BRL Trials)	2010-11, 2011-12	2	2	2589	

Comments:

1. Yield advantage of DMH 11 over two existing hybrids is considerably high, but the BRL trial was conducted at only one location-Kumher.

Ref: AICRP Reports and BRL Reports

Mean Seed Yield (Kg/ha) DOCTORED during BRL trials (Kumher)? “Derived Yield vs. Reported Yield”

Entries	2010-11		2011-12	
	As per Pod-seed-test weight Calculation	Actually Reported after harvest	As per Pod-seed-test weight Calculation	Actually Reported after harvest
Varuna Barnase (bn 3.6)	4284	1986	7541	2484
EH2 Barstar (modbs 2.99)	2984	1730	4231	1640
Varuna	4525	1866	7750	2375
EH2	3160	1793	4752	1874
DMH-11	4462	2285	6712	2892
RL 1359/ Maya	4830	2057	5913	2196

Ref: BRL Reports

Mean Seed Yield (Kg/ha) DOCTORED during BRL trials (Alwar)?

Entries	2010-11		2011-12	
	As per Pod-seed-test weight Calculation	Actually Reported after harvest	As per Pod-seed-test weight Calculation	Actually Reported after harvest
Varuna Barnase (bn 3.6)	5758	1789	7596	2098
EH2 Barstar (modbs 2.99)	5211	1842	8391	1582
Varuna	5548	1741	9226	2169
EH2	6194	1716	4659	1609
DMH-11	5612	2516	15342	3158
RL 1359/ Maya	4488	1767	7109	1837

Ref: BRL Reports

Harvest Index during BRL Trials

Entry/ Location	Kumher		Alwar		Sgnagar
	2010-11	2011-12	2010-11	2011-12	2010-11
Varuna Barnase (bn 3.6)	3.79	2.74	13.74	1.80	1.92
EH2 Barstar (modbs 2.99)	3.94	1.86	15.31	1.16	1.68
Varuna	4.18	3.15	14.88	1.72	2.08
EH2	4.88	2.63	12.21	1.57	1.55
DMH-11	3.32	3.40	15.91	1.29	2.04
Maya/RL1359	3.93	2.81	11.88	0.99	1.51

Year-Wise Comparison

DMH-11 compared with Existing Cultivars (Zone II) 2010-11

Cultivar	Number of Trials	MSY (Kg/ha)	% Difference in MSY of DMH-11 over respective cultivar
Varieties (MSY based on AICRP trials)			
DRMRIJ-31 (IVT-AVT)	7	2757	0
NRCDR-2 (IVT-AVT)	14	2392	15.3
NRCDR-2 (IHT-AHT)	11	2337	18
Hybrid (MSY based on AICRP trials)			
DMH-1 (IHT-AHT)	12	2729	1.1
NRCHB-506 (IHT-AHT)	5	2407	14.6
CORAL- 437 (IHT-AHT)	6	2656	3.8
Transgenic Hybrid (MSY based on BRL trials)			
DMH-11 (Alwar-SGnagar)	2	2758	

Ref: AICRP Reports and BRL Reports

DMH-11 compared with Existing Cultivars (Zone II) 2011-12

Cultivar	Number of Trials	MSY (Kg/ha)	% Difference in MSY of DMH-11 over respective cultivar	
Varieties (MSY based on AICRP trials)			Using DRMR Data	Using Developer Data
DRMRIJ-31 (IVT-AVT)	7	2414	30.8	50.7
NRCDR-2 (IVT-AVT)	14	2254	40.1	61.4
NRCDR-2 (IHT-AHT)	5	2480	27.3	46.7
Hybrid (MSY based on AICRP trials)				
DMH-1 (IHT-AHT)	5	2684	17.6	35.5
NRCHB-506 (IHT-AHT)	5	2427	30.1	49.9
Transgenic Hybrid (MSY based on BRL trials)				
DMH-11(Alwar) DRMR Data	1	3157	15.2	
DMH-11 (Alwar) Developer Data	1	3638	-	

Ref: AICRP Reports and BRL Reports

DMH-11 compared with Existing Cultivars (Zone II) 2014-15

Cultivar	Number of Trials	MSY (Kg/ha)	% Increase of DMH-11, over respective cultivar
Varieties (MSY based on AICRP trials)			
RH-749 (IVT-AVT)	9	2329	2.4
DRMRIJ-31 (IVT-AVT)	9	2450	-2.6
Hybrid (MSY based on AICRP trials)			
DMH-1 (IHT-AHT)	7	2035	17.2
NRCHB-506 (IHT-AHT)	7	2315	3.1
Transgenic Hybrid (MSY based on BRL trials)			
DMH-11 (Delhi-Bathinda-Ludhiana)	3	2386	

Ref: AICRP Reports and BRL Reports

DMH-11 compared with Existing Cultivars (Zone III) 2010-11

Cultivar	Number of Trials	MSY (Kg/ha)	% Increase of DMH-11 over respective cultivar
Varieties (MSY based on AICRP trials)			
DRMRIJ-31 (IVT-AVT)	6	2322	-1.6
Hybrid (MSY based on AICRP trials)			
DMH1 (IHT-AHT)	6	2167	5.4
NRCHB506 (IHT-AHT)	6	2179	4.6
Transgenic Hybrid (MSY based on BRL trials)			
DMH-11 (Kumher)	1	2285	

Ref: AICRP Reports and BRL Reports

DMH-11 compared with Existing Cultivars (Zone III) 2011-12

Cultivar	Number of Trials	MSY (Kg/ha)	% Difference in MSY of DMH-11 over respective cultivar	
			Using DRMR Data	Using Developer Data
Varieties (MSY based on AICRP trials)				
Hybrid (MSY based on AICRP trials)				
DMH1 (IHT-AHT)	6	1922	50.5	73.4
NRCHB506 (IHT-AHT)	6	2294	26.1	45.2
Transgenic Hybrid (MSY based on BRL trials)				
DMH-11 (Kumher) Based DRMR data	1	2892	15.2	
DMH-11 (Kumher) Based on Developer Data	1	3332		

Ref: AICRP Reports and BRL Reports

DMH-11 compared with Existing Cultivars (Zone II+Zone III) 2010-11

Cultivar	Number of Trials	MSY (Kg/ha)	% Difference in MSY of DMH-11 over respective cultivar
Varieties (MSY based on AICRP trials)			
DRMRIJ-31 (IVT-AVT)	13	2556	1.7
NRCDR-2 (IVT-AVT)	14	2392	8.7
NRCDR-2 (IHT-AHT)	11	2337	11.3
Hybrid (MSY based on AICRP trials)			
DMH-1 (IHT-AHT)	18	2541	2.3
NRCHB-506 (IHT-AHT)	11	2282	13.9
CORAL-437 (IHT-AHT)	6	2656	-2.1
Transgenic Hybrid (MSY based on BRL trials)			
DMH-11 (Kumher-Alwar-SGnagar)	3	2600	

Ref: AICRP Reports and BRL Reports

DMH-11 compared with Existing Cultivars (Zone II+Zone III) 2011-12

Cultivar	Number of Trials	MSY (Kg/ha)	% Difference in MSY of DMH-11 over respective cultivar	
			Using DRMR Data	Using Developer Data
Varieties (MSY based on AICRP trials)				
DRMRIJ-31 (IVT-AVT)	7	2414	25.3	44.4
NRCDR-2 (IVT-AVT)	14	2254	34.2	54.6
NRCDR-2 (IHT-AHT)	5	2480	21.9	40.5
Hybrid (MSY based on AICRP trials)				
DMH-1 (IHT-AHT)	11	2269	33.3	53.6
NRCHB-506 (IHT-AHT)	11	2354	28.5	48
Transgenic Hybrid (MSY based on BRL trials)				
DMH-11 (Kumher and Alwar) as reported by DRMR)	2	3024		
DMH-11 (Kumher and Alwar) as reported by developer	2	3485		

Ref: AICRP Reports and BRL Reports

DMH-11 compared with Existing Cultivars (Zone II+Zone III) 2014-15

Cultivar	Number of Trials	MSY (Kg/ha)	% Difference in MSY of DMH-11 over respective cultivar
Varieties (MSY based on AICRP trials)			
RH-749 (IVT-AVT)	12	2201	8.4
DRMRIJ-31 (IVT-AVT)	9	2450	-2.7
NRCDR-2 (IVT-AVT)	0	-	
Hybrid (MSY based on AICRP trials)			
DMH1 (IHT-AHT)	11	2106	13.2
NRCHB506 (IHT-AHT)	11	2375	0.4
CORAL 437 (IHT-AHT)	0	-	
Transgenic Hybrid (MSY based on MLT and BRL trials)			
DMH-11 (Delhi- Bathinda- Ludhiana)	3	2385	

Ref: AICRP Reports and BRL Reports

Other Issues related to Quality of Trials

- **Issues with Protocols and permissions**
- **Issues with data collection**
- **Issues with data analysis**
- **Issues with reporting of results**

Observations related to susceptibility to Major diseases

Trial	Location	Alternaria Leaf	White Rust	Powdery Mildew	Sclerotinia	Downy mildew	Orobanch e
BRL-I, 1st Year (2010-11)	Kumher	All Nil	All Nil	✓	All Nil	All Nil	All Nil
	Alwar	✓	✓	✓	✓	All Nil	✓
	SG nagar	✓	✓	All Nil	All Nil	All Nil	All Nil
BRL-II, 2nd Year (2011-12)	Kumher	✓	✓	✓	All Nil	All Nil	All Nil
	Alwar	✓	✓	All Nil	All Nil	All Nil	✓
	SG nagar	✓	✓	All Nil	All Nil	All Nil	All Nil
BRL-III, 3rd Year (2014-15)	Delhi	✓	✓	-	✓	0	0
	Bhatinda	✓	✓	0	0	0	0
	Ludhiana	✓	✓	0	✓	0	0

Ref: BRL Reports

A case of Reporting for Sclerotinia Rot

- **January 2012 Temp. ranged from 5.5 degree C to 18.9 degree C and rainfall was 24.3 mm on one rainy day. The climatic conditions were very much convenient for the incidence of sclerotinia rot (stem rot) in Indian Mustard and almost all entries under AICRP trial were infected with the disease incidence (at 100 DAS) with range of 4.1% to 94.9% under artificial conditions and similar infections were reported in field conditions. It is surprising that BRL-1, 2nd year trial conducted at KVK, Kumher, just 10 kms away from AICRP trials records NIL for all entries in all replications.**
- **This is an illustration, amongst several others that creates doubts on the accuracy and competence of the team involved in recording data.**

Observations related to susceptibility to insect pests

Trial	Location	Mustard Aphid	Painted Bug	Leaf Miner	Cabbage Butterfly	Mustard Sawfly	Termites
BRL-I, 1st Year (2010-11)	Kumher	✓	All Nil	All Nil	All Nil	All Nil	All Nil
	Alwar	✓	✓	All Nil	All Nil	All Nil	All Nil
	SG nagar	✓	All Nil	All Nil	All Nil	All Nil	All Nil
BRL-II, 2nd Year (2011-12)	Kumher	✓	All Nil	All Nil	All Nil	All Nil	All Nil
	Alwar	✓	All Nil	All Nil	All Nil	All Nil	All Nil
	SG nagar	All Nil	All Nil	All Nil	All Nil	All Nil	All Nil
BRL-III, 3rd Year (2014-15)	Delhi	✓	0	0	0	0	0
	Bhatinda	0	0	0	0	0	0
	Ludhiana	0	0	0	0	0	0

Ref : BRL Trial Reports

IS THIS POSSIBLE & WILL GEAC DEPEND ON SUCH DATA?

Observations related to beneficial insect

Trial	Location	Coccinelids	Chryso-pherla	Syrphid Fly	Honeybee
BRL-I, 1st Year (2010-11)	Kumher	All Nil	All Nil	All Nil	✓?
	Alwar	All Nil	All Nil	All Nil	✓?
	SG nagar	All Nil	All Nil	All Nil	✓?
BRL-II, 2nd Year (2011-12)	Kumher	All Nil	All Nil	All Nil	✓?
	Alwar	✓	All Nil	All Nil	✓?
	SG nagar	All Nil	All Nil	All Nil	✓?
BRL-III, 3rd Year (2014-15)	Delhi	✓	0	0	✓?
	Bhatinda	0	0	0	✓?
	Ludhiana	0	0	0	✓?

WILL THE REGULATORS BELIEVE THIS KIND OF DATA?

IS IT A CASE OF INSECTS NOT BEING PRESENT OR NO OBSERVATIONS MADE AT ALL?

Ref : BRL Trial Reports

Inconsistencies in Data related to Biomass & estimated harvest index

Trial	Location	Range of reported biomass production at maturity (g)	Note
BRL-I, 1st Year (2010-11)	Kumher	362.5 -687.5	Plants were cut from the ground, estimated at KVK
	Alwar	110 - 150	
	SGnagar	1206.6 – 1430.1	No information
BRL-II, 2nd Year (2011-12)	Kumher	685 - 870	?
	Alwar	660 - 1400	?
BRL-III, 3rd Year (2014-15)	Delhi	188.5 – 244.2	Whole Plant was uprooted
	Bhatinda	108.0 – 184.0	
	Ludhiana	0.7 – 0.8	“Incorrect data” as mentioned in the Report. Observations seems to have been taken in Kg.

Thanks

Which is REAL DMH-11?

Until 2006-07:

- F1 of EH-2 (Barnase) X Varuna (barstar)

During BRL:

- F1 of Varuna (Barnase) X EH-2 (Barstar)

Technically this can be considered as reciprocal cross- not exactly.

Critical Objection:

- When the parents are swapped, the offspring is bound to be different in terms of cytoplasmic inheritance
- This also has implications for event selection and stability
- Has this swapping happened with regulatory clearance or ignorance?
- Has GEAC discussed this?
- Is maintenance of one biosafety dossier under the name of DMH-11 acceptable?
- Has separate Event Selection process of applying, being permitted and testing happened?