

**IN THE SUPREME COURT OF INDIA  
CIVIL ORIGINAL JURISDICTION**

**I.A. NO. 47 OF 2016**

IN

**WRIT PETITION (CIVIL) NO. 260 OF 2005**

**IN THE MATTER OF:-**

Aruna Rodrigues & Ors.

.....Petitioners

Versus

Union of India & Ors.

.....Respondents

**REJOINDER AFFIDAVIT ON BEHALF OF PETITIONERS  
TO THE AFFIDAVIT FILED BY RESPONDENTS**

I, Aruna Rodrigues, D/o Theresa Rodrigues, R/o Bungalow 69, Mhow Cantt., Madhya Pradesh- 453441, do hereby solemnly state and affirm as under:

1. That I am Petitioner No.1 in the Writ Petition mentioned above and am fully acquainted with the facts and circumstances of this case and am fully authorised to swear this affidavit on behalf of all the other Petitioners.
2. That abovementioned Writ Petition has been filed by the Petitioners seeking a moratorium on the release of any genetically modified organisms (GMOs) into the environment pending a comprehensive, transparent and rigorous biosafety protocol in the public domain conducted by agencies of independent expert bodies, the results of which are made public.

3. The Reply Affidavit of the Union of India (U of I) is an astonishing response from the Country's Regulators. Rather, it is what would be expected from a GMO Crop Developer. A 'filibustering', copious response, it clearly reflects a high degree of scientific and technical incompetence in the regulatory oversight of HT Mustard DMH 11, but yet claims the absolute opposite. The 'Reply is brazen, misleading and weak in its interpretation of available data and facts. This Rejoinder Affidavit deals with the essential evidence (of the 'Reply') that provides further proof of these charges on 7 grounds: (a) 2<sup>nd</sup> year BRL 1 trials were altered in 2014, and restored to original (official) data in 2016; (b) HT DMH 11 and its 2 parental line HT GMOs are scientifically and therefore, unambiguously HT crops; (c) India is a centre of diversity/domestication of Mustard with a rich germplasm (this is not a reference to seed gene-banks). This is the focus of Petitioners, which the Regulators habitually ignore as they did with Bt brinjal (India has the richest brinjal diversity in the world). The case of mustard is not less. Contamination from commercialised HT DHM11 of India's Mustard germplasm is a *'certainty and the outstanding concern'*; (d) HT DMH 11 discarded wholesale, scientific norms in field trials, including specifically BRL trials and are most certainly invalid; (e) HT Mustard DMH 11 remains unproven on scientific grounds, as a superior hybrid-making technology; (f) the cumulative evidence is that Mustard DMH11 (and its HT GMO Parental lines) are 'frivolous' GMOs, a monumental and dangerous bluff; that the Nation has been fooled as even the PMO into believing that HT DMH 11 will reduce imports of oilseeds because it will provide high-yielding

hybrids through the B&B system; (g) the case of Dr Paroda the 6th member of the TEC demonstrates why his report must be discarded.

**3.1. Huge Conflict of Interest: the Regulators' Turf is not the citizens of India, but instead HT Mustard DMH 11 (ref IA 47 point 5):** On the other hand, the *'Reply'* of the U of I demonstrates a concentrated and it may be said, even outraged defence of the Regulators turf, which is HT DMH 11. Petitioners humbly bring to the notice of this Hon'ble Court that HT Mustard DMH 11 and its two HT parental lines that are before the GEAC for commercial approval, are funded by the Regulators, promoted by them and regulated by them. This is simply unacceptable and the evidence shows the outcome of such 'hand-in-glove' and subterranean regulation that seeks to hide the data from scientific and public scrutiny and release HT mustard to the detriment of India.

- **Dr Paroda's conflict of interest in HT DMH 11:** Dr Paroda, was insinuated into the TEC after its 1<sup>st</sup> or Interim Report, promotes and supports specifically, the commercialisation of HT mustard and corn (ref. IA 42 of 2013 points 7&10 and WS point 20 (2014)): His Trust TASS is not a public institution. It is funded and promoted by GM seed companies and has/had on its board other GM crop developers, e.g. the NDDB (National Dairy Development Board), which was involved in the development of Dr Pental's GM mustard DMH 11. This is the astounding degree of the infused conflict of interest in HT DMH 11 resulting in regulation being thoroughly undermined in its rigour and independence as evidenced in Petitioners' Application of Oct. 2016 and several earlier Submissions.

- **Independent Corroboration of 4 External G of I Reports:**

Petitioners ask the Court's indulgence to reiterate that there is the remarkable consensus in 4 official Govt. Reports that endorse and reinforce Petitioners' charges that regulation in India lacks specific GMO expertise; that there are cover-up, lies and fraud; that furthermore, the findings of the SC- appointed TEC, in its 5-member unanimous TEC Report with Government nominees on the Committee, is underscored by 3 of these other official G of I reports ie the Sopory committee report, the Parliamentary Standing Committee Report (both of 2012) and the Jairam Ramesh Report of Bt brinjal in 2010 (ref. several Submissions including the WS of 2014, pg. 7 & point 23).

**4. DATA OF BRL I (2<sup>ND</sup> YR) FIELD TRIALS FUDGED UPWARDS IN 2014 BY 15.2% AND THEN 'UNFUDGED' IN 2016**

At point 92 on page 58 of the 'Reply', Respondents state:

*"Authentic data on BRL I & II trials is the one submitted by the DRMR to GEAC. There are no discrepancies in the data submitted by the DRMR and the one in the Dossier submitted by the developer. All observations and analyses by the regulator is based only on the submitted Dossier and correct figures are displayed for public review in the AFES document. Any reference to other documents is beyond the purview of safety assessment by the regulators".*

**NOTE: This claim is debunked by the evidence:** 'Other' documents, which are contrived to being excluded now from 'purview' are precisely those official documents which were central to the purview of the Regulators for assesment: documents to the RCGM

by the Developers reporting scientific data of BRLI field trials including MSY (2010-11 & 2011-12), their basis thereafter, for permission for the next stage trials (BRL II, in 2014-15) and onward for permission for commercial release at the end of BRL I & II. (Petitioners Application IA 47 Annexure M5). These documents are quite simply core documents quite surely within the purview of the Regulators and they are dated well before the AFES document naturally, of 2016.

**Annexure Q1:** 'Assessment of Food & Environmental Safety', pg. 105 (488): dated 2016 of MSY in BRLI trials of HT Mustard DMH 11 (see 2<sup>nd</sup> Yr.)

**4.1 The Evidence:** Annexure M7 (ref Petitioners' Application IA 47): The Table below is a reproduction of Petitioners' Application IA 47 Table G on page 41, but now incorporates additional remarks of clarification as relevant, in order to conclusively prove that in 2016, CGMCP/DUSC 'returned' the data of BRL I 2<sup>nd</sup> year trials in the AFES document to the original, official statistics of MSY submitted to the GEAC/DUSC by the DRMR over 2 years earlier. It is emphasised that the data under discussion is BRL I trials, year 2 which were concluded in 2011-12.

The facts are:

i. Annexure M7 is the yield reported of BRL I trials year 1 & 2 in the document, 'Summary of Safety Studies and Field Trials' dated 2 April 2014, and submitted to the RCGM by the CGMCP/DUSC. The MSY data in year 2 of BRL I in this document has been manipulated by the Developers. It is 15.2% higher than the official MSY data 'returned' by the DRMR to the GEAC. This is Document (of April 2014), on the basis of which, HT mustard and DMH 11 and its 2 HT parental lines

were given clearance for large-scale trials in 2014-15. And the consolidated results of both BRL I & II formed the basis for the request for commercial release (ref Annexure M6 – Petitioners Application of Oct 2016, IA 47) dated in 2015.

**NOTE:** whichever way you look at it, BRL trials cannot be considered legitimate on yet another parameter, this time of fudged data. These trials are seriously invalid. Their basis for the Developers' request for commercial approval of DMH 11 (plus 2 GMOs) is fraudulent. Likewise, the Regulators acquiescent role in this process invites a charge of criminal conduct and intent to deceive, with inestimable ramifications of harm to our Nation. A criminal investigation is required of these processes.

ii. Annexure Q1 (above) shows that the revised 'upped' data in Annexure M7 was *reversed* in the AFES Document, to show equivalence now, in 2016 with the official DRMR data in 2015 of BRL I & II submitted to the GEAC.

iii. The MSY of HT DMH 11 based on Annexure M7 impacts the overall MSY and is 2824 kg/Ha for the full BRLI & II trials ie 7.5% higher than the official DRMR MSY of 2626kg/Ha.

The Table below provides the clarity required.

**DMH 11: COMPARATIVE MSY OF ALWAR & KUMHER TRIALS BRLI  
2010 -11 & 2011- 12 ZONE-WISE  
AND**

**CGMCP/DUSC RIGGED DATA &  
SUBSEQUENTLY RESTORED DATA IN AFES DOC.**

Columns:		A		B		C	
		<b>OFFICIAL DRMR DATA of MSY</b>				<b>*CGMCP DATA RIGGED MSY 2 April 2014</b>	
		<b>^AFES Doc &amp; DRMR data (now equivalent)</b>				<b>BRL I: 2<sup>nd</sup> yr. 2011-12</b>	
<b>BRL I Zone</b>	Entry	<b>BRL I 1<sup>st</sup> Year 2010-11</b>	<b>BRL I 2<sup>nd</sup> Year 2011-12</b>	<b>BRL I % change yr. on yr. (yr. 2 over yr. 1)</b>	<b>All Entries increased by 15.2%</b>		
		ALWAR	ALWAR	ALWAR	<b>ALWAR * (new %s) 2<sup>nd</sup> yr. over 1<sup>st</sup> yr.</b>		
<b>II</b>	<b>Varuna (barnase)</b>	1789	2098	<b>17%</b>	2419	<b>(35.0%)</b>	
	<b>EH-2 (barstar)</b>	1842	1581	<b>(16%)</b>	1823	<b>NIL</b>	
	<b>Varuna</b>	1741	2169	<b>24.6%</b>	2499	<b>(43.5%)</b>	
	<b>EH-2</b>	1716	1608		1854	<b>(0.8.0%)</b>	
	<b>DMH-11</b>	<b>2515</b>	<b>3157</b>	<b>25.5%</b>	<b>3638</b>	<b>(44.7%)</b>	
	<b>RL-1359(ZC)</b>	1767	1836		2116	<b>(19.8%)</b>	
		<b>KUMHER</b>	<b>KUMHE R</b>		<b>KUMHER *</b>		
<b>III</b>	<b>Varuna (barnase)</b>	1986	2484	<b>25%</b>	2862	<b>(44.1%)</b>	
	<b>EH-2 (barstar)</b>	1730	1640		1890	<b>(09.0%)</b>	
	<b>Varuna</b>	1866	2375	<b>27%</b>	2736	<b>(46.6%)</b>	
	<b>EH-2</b>	1793	1873		2159	<b>(20.4%)</b>	
	<b>DMH-11</b>	<b>2285</b>	<b>2892</b>	<b>26%</b>	<b>3332</b>	<b>(45.8%)</b>	
	<b>Maya (ZC)</b>	2057	2195		2530	<b>(23.0%)</b>	

Reproduced from Application IA 47 (Oct 2016) (Table G pg41)

\* Col C: Yield Reported to RCGM by CGMCP: dated 2 April 2014: SOURCE: Report of 'Summary of Safety Studies and Field Trials' conducted on Transgenic *Brassica juncea* containing *bar*, *barnase* and *barstar* Genes: Biosafety Research Level-I (BRL-I) Second Year Trials submitted to the RCGM by the CGMCP, DUSC New Delhi on April 2 2014: Pg 27 (ref IA 47 Annexure M7.)

**Note:** The new overall MSY (for BRL I & II) therefore, is: **2824 kg/Ha** or an increase of **7.5 %** on the official DRMR MSY of **2626 kg/Ha** submitted to the regulators.

**^Cols A & B:** ^AFES Doc of 2016 (Annexure Q1). The data is restored in year 2 BRL I and is the same as the DRMR official submission to the GEAC.

**Note:** during BRL I trials, in year 2, Alwar & Kumher were the only 2 locations for field trials (1 in each Zone): The data is therefore, confined to these locations.

**5. THE GM-PARENTS ‘VARUNA BN 3.6’ AND ‘EH2 MODBS 2.99’ AND GM MUSTARD HYBRID DMH-11 ARE UNAMBIGUOUSLY & UNEQUIVOCALLY ‘HERBICIDE TOLERANT’ CROPS**

Respondents confront Petitioners for falsely calling DMH 11, as HT DMH 11 ie a herbicide Tolerant Crop. They deny that it is; but also admit that it is! It is stated that whether it is or it isn't depends on the Regulators'/Developers' recommendation of whether the HT trait is to be used in the farmer's field. This is the Non-Science that Petitioners confront. The key points of Respondents 'Reply' are as below, followed by Petitioners' comments:

**At point 57 pg. 42:** *“--- Petitioners--- have chosen to confuse the Hon'ble Court in an attempt to relate it to the recommendation of the 5 member TEC by calling it HT mustard”.*

**At 27 pg. 17:** *“Herbicide is not required in the farmers' field to realize higher yield....Therefore use of the herbicide is only for a limited purpose –hybrid seed production.”*

**At 59 pg. 41:** *“Here it is ‘Hybrid Technology’ and not ‘Herbicide Tolerance’, which globally ‘HT’ acronym stands for”.*

**At 42 Pg. 61:** *“The term would be appropriate only when the herbicide tolerant trait in the hybrid is the commercial trait.”*

**At 66 pg. 45:** *“While the presence of ‘bar’ gene makes the crop resistant to herbicide ‘Basta’ (Phosphinothricin) –there is no proposal to use this herbicide in the farmers' field. Herbicide is not required for increase in the yield. Herbicide is only required in the hybrid seed production plots and developers have only sought permission for the use of herbicide for hybrid seed production.”*

**5.1 Petitioners' Comment**



- In 2006, exceptional status was requested and given by the Hon'ble SC for HT DMH 11 to be field tested. It was a HT Crop then, when leading international scientists examined the construct and routinely described it as a HT crop, exactly as HT rape in Canada, which is the international acronym for herbicide tolerance. The presence of the 'bar' gene is a commercial trait for 'Herbicide Tolerance' and understood thus, globally. Indeed, nothing has changed since then and that single field trial in 10 locations is the exceptional status under which DUSC conducted that test in 2006-7 with the same DMH 11 (ref. IA 47 point 3.2, pg. 6).
- The gene for glufosinate herbicide resistance will be present in mustard hybrids made using the barnase/barstar system. This is because the herbicide resistance gene is physically immediately adjacent to the barstar or barnase genes (physically attached). This is what geneticists call 'linked', and it means the genes essentially cannot be separated from each other. Therefore, wherever the barstar or barnase genes are found, as in hybrid mustard and rape (Canada) plants, functional glufosinate resistance genes will also be found, conferring resistance to the herbicide to all of the plants containing this gene (scientists statements distilled from previous submissions)
- The presence of the '*bar*' gene makes the crop resistant to herbicide '*Basta*' (Phosphinothricin). Respondents then make the statement that "*there is no proposal to use this herbicide in the farmers' field*". Such arguments smack of ignorance and carelessness of how a HT GM crop can be possibly used and more dangerously, approved for commercialisation by the GEAC stating

that there is no proposal to use this herbicide in the farmers' field. DMH-11 is a 'Herbicide Tolerant' crop by virtue of the presence of 'bar' gene irrespective of whether there is a proposal to use the herbicide in the field or not. It provides farmers with a clear option to use the herbicide Basta on the 'HT crop' for weed control. Indeed, Petitioners bring to the notice of this Hon'ble Court that illegal HT cotton BG II-RRFlex has been allowed by the Regulators to be grown on near commercial scale across several states including Gujarat for over 8 years up to the present time (ref WS point 6 on pg. 7). In 2009, when this was brought to their attention by lead Petitioner, a damp squib-of-a-notice was sent to Monsanto. Nothing happened to stop illegal planting of HT cotton. Respondents' argument in the matter of DMH 11 is a blatant misrepresentation of facts, expedient policy and scientifically untenable. The following question wraps it up:

- **Question:** Will the GEAC approve 'BG-II-RRFlex' that contains Bt genes + EPSPS (for Glyphosate tolerance) as only 'BG-II Bt-cotton', if the developer states that there is no proposal to use this herbicide in the farmers' field?

## **6. CERTAIN CONTAMINATION OF INDIAN MUSTARD GERM PLASM IF HT DMH 11 IS COMMERCIALISED**

**6.1 At 102 pg. 64** of their 'Reply' Respondents accuse Petitioners of misleading this Hon'ble Court by calling India a 'Centre of Origin' of Mustard and that India is not a centre of origin, but accept that parts of India are a Secondary Centre of Origin, and that indeed, the whole Question is still being researched, as referenced in the Mustard Biology Doc Annexure R 12. Petitioners clarify in the first instance

that they have described it thus: Centre of origin/diversity to indicate the thrust of the argument that appears to be lost on the GEAC ie the matter of a rich gene pool. That the issue of GMO contamination is the most serious of issues with GMOs and has been dealt with in a primary thrust in this PIL from the very start 11 years ago. The analogy with drugs and smoking were used to clarify why. Petitioners therefore, request this Hon'ble Court's indulgence to dwell on this matter, addressing some main concerns and the empirical evidence of contamination from various submissions over the years, so that it is amply clarified that with regard to GMOs the thrust of this debate on contamination is also emphatically, the genetic diversity of a crop, the risks entailed if that diversity is lost. It is also the specific matter of the Contempt Petition of 2015, because large-scale trials of DMH 11 and Varuna-barnase (sterility pollen) carry unacceptable contamination risks to our mustard germ-plasm. Given the Regulators unconscionable attitude to Bt brinjal with regard to contamination, the approach to sidestep the core issue and address technicalities instead, is unfortunate.

**6.2 A 20 year history (various countries) of contamination:** it shows that GMO Contamination of Non-GMO crops is a biological certainty, and is the outstanding concern, because it is irreversible. There is no co-existence and in a commercialised crop, contamination is certain. Bayer LL601 rice represents a stern reminder of what can happen even from a "*single field trial*" (conducted in Louisiana State University in 2006), which contaminated US long grain rice. The export losses to farmers were in excess of 2 Billion \$s as exports collapsed. Farmers sued (ref WS

of 2014 for a list of contamination incidents point 16; Annexure W9 colly Vol XXXIII). In Canada, as a result of the genetic modification of rape (HT rape with the B&B genes, the very same 3 alien genes as in HT DMH 11), the whole system is contaminated and Canada *irretrievably* lost her organic and Non-GMO status for rapeseed exports to the EU within a few years. The propensity for contamination in rape/mustard is particularly high, and has occurred over several Km; very small sticky pollen which insects/bees love, (ref Additional Affidavit of Oct 2015 at 19 vii and Annexures P4 and P10). In crops of origin or diversity in particular, GMO contamination leads to a loss of native varieties that contain important genetic diversity needed for future traits. These traits are bred into crop varieties through traditional breeding techniques that GE has failed to match. The fact is that GE crops themselves must rely on Nature's genetic diversity to supply what is required in traits of parental lines to meet new problems and diseases like for example, drought, pest or saline resistance. In the case of HT Mustard DMH 11 the Developers must rely on India's highest yielding (NON-GMO) varieties bred under the AICRP-RM (and coordinated by the DRMR), developed through traditional breeding, for introgressing HT parental lines like Varuna-Barnase and EH2-Barstar for making hybrids. The spread and rate of contamination in the B&B system is provided in Petitioners Additional Affidavit of 2015 (at 19 ix) -- (ref Annexure P10 - Gurian Sherman). This is why many countries that are '*centres or functional centres of origin or diversity*' of plant species refuse to allow GMOs in those crops and this is also the reason why the 5-Member TEC has recommended that GMOs be banned in crops where India is a centre

of origin/diversity/domestication. The accent is on diversity/rich germplasm (irrespective of the discussion of origin, secondary origin etc). India holds a rich store house of genetically diverse germ plasm and plant traits, (one of the few remaining hotspots of plant diversity in the world), that is vital for our future food security and well-being. The consequences of GMO contamination will be devastating for India. Such crops of origin/diversity include rice, brinjal and mustard. It is significant that in the 75<sup>th</sup> GEAC Meeting of March 2007, the GEAC at the instance of the basmati rice exporters and the Ministry of Commerce, decided *not to allow (it may be noted, small-scale as opposed to large-scale) field trials of GM rice in the basmati growing areas of the country, because of the threat of contamination. (Volume– XXXIII- Annexure W10).*

The clear record shows that our regulators were willing for India's brinjal varieties to be contaminated when it approved Bt brinjal for commercial release, a decision overturned by erstwhile MOEF Jairam Ramesh. Yet India has the world's greatest brinjal diversity of 2500 varieties (Andow) and this is in large part why the indefinite moratorium was imposed in 2010. The brinjal assessment by several leading international scientists many of whom were/are advisors to the UN/CBD revealed the great malaise of Indian GMO regulation and exposed the rot. That assessment is a test case of regulatory delinquency before this Hon'ble Court. The regulatory oversight now of HT mustard DMH 11 overtakes the regulatory shambles connected with Bt brinjal, and its implications are alarming, which is why HT mustard DMH 11 and its parental HT lines must be banned and any planting for seed production uprooted immediately.

**6.3 Bees:** Indian rapeseed- mustard is pollinated largely by bees. Several other wild brassica species may be insect or wind pollinated and could survive indefinitely in the wild. In some of these species GMO contamination has occurred several kilometres from fields as has been recorded in Canada with HT rape. Yet:

At pg. 86 of the AFES doc: “---DMH-11 pollen travelled only up to 20m---”. Unless the bees have a fascination for DMH 11, it is not clear how and why insects and bees ‘can’ restrict themselves to only 20 m. This is somewhat of a mystery.

## **DMH 11: OF NORMS, COMPARATORS, HYBRIDS, & YIELD**

### **7. NORMS**

**7.1 At points 82-84 of their ‘Reply’, Respondent make 3 points:**

**(a) At 82 page 53:** BRL I&II trials were conducted under “*the guidance*” of the DRMR. RTI is a legal instrument. Petitioners’ are informed that this is in essence not true.

**(b) At 83 & 84: The thrust is:** Differentiating between AICRP trials, “*a different set of trials –*” and the ‘Rules’ governing GMO trials in BRL I & II (2008): “*to test “performance of target traits --- and productivity as prescribed of a GE entry for its similarity to its ‘near-ISOGENIC parental genotype”, and*

**(c) At 85:** “*the most important objective of BRL I&II trials is to establish equivalence of the GE lines and their comparators-Non-GE near isogenic parents.*”---

**7.2 Petitioners comments:** This nation has the right to expect and therefore, demand the most rigorous and stringent risk assessment protocols for GMOs, prioritising biosafety, for assessment by experts

who are independent, without conflicts of interest. But this is far from being the case. A discredited US system which has deregulated GMOs is not the benchmark for India. There are serious issues concerning greatly reduced norms to the point of *'unsafety'* for easier compliance. The inadequacy of the BRL trials for GMOs is a key one. Lines. AICRP-RM trials co-ordinated by India's Apex institute for mustard research attempt to implement tried and tested norms for selection of varieties/hybrids for stability and performance for farmers' fields. Indeed Respondents have stated in various documents that these are exactly the requirements for testing GMOs. It cannot be otherwise. Yet, these are not conclusions which may be drawn from the norms followed for BRL trials of DMH 11 and its entries. These trials defy basic norms leave alone rigorous norms and therefore, allow no valid conclusions to be drawn for MSY in these trials especially of DMH 11 because:

- **HT DMH 11 BRL trials** should have been conducted over several years, climatic zones and frequency within Zones and with the correct entries and 'Comparator's'. The BRL trials were instead one-off trials. The end point is, that trials must lend themselves to statistically valid conclusions. These manifestly do not and the RTI from the DRMR specifically says so.
- **Valid Comparators:** There were no Non-GMO CMS hybrids amongst the entries. HT DMH 11 is a hybrid and must be tested against hybrids. But the single most important criteria according to the Respondents quite correctly and the Rules, is that:

**Note: the Hybrid 'Comparator' 'VEH2-F1' was mandatory for scientific assessment:** HT DMH 11 had to be tested against its Non-

GMO hybrid of “*near-isogenic lines*”. This is specifically ‘VEH2-F1’ the hybrid of parent lines Varuna and EH2. This was not done. More evidence is provided on this matter in point 8 below of this Submission. But on its own, and in accordance with the Regulators own Rules, this single glaring omission disqualifies HT DMH 11; no scientifically valid claims may be made for superior yielding hybrids from the B&B technology.

## **8. HYBRID TECHNOLOGY & YIELD AND THE CLAIMS MADE FOR HT DMH11**

### **8.1 Reply Affidavit:**

**At 27, Page 17:** *“Heterosis is due to the careful selection of parents and not due to the three transgenes”*

**At 65, page 45:** *“The developers have nowhere claimed that the yield increase is due to the three transgenes”*

**At 88, pg.56:** *“No such claim has been made in any of the submitted documents that DMH 11 out-performs Non-GMO hybrids. The comparison has only been made between hybrid DMH 11, NC (national Check) Varuna and the appropriate ZC (zonal checks) --- MSY of 2670 Kg/ha has been recorded over three years of BRL trials which is 28% and 37% more than the NC & ZC respectively.*

**8.2 Petitioner Comment: Indeed, heterosis is not due to the 3 transgenes;** and the ‘*careful*’ selection of parents for heterosis through the B&B system will be of India’s best Non-GMO varieties or traditional breeding. With these statements the Union of India effectively buries its own ‘raison d’être’ for its HT Mustard DMH 11 and its ‘HT variants’ and concedes the scientific challenge in this



Hon'ble Court and out of it by an informed civil society that DMH 11 does not out-yield India's best NON-GMO cultivars and this means both varieties and hybrids against which this mustard was not tested in BRL I & II trials (2010-11 to 2014-15).

**Question: So what is the point of DMH 11?** Incredibly, it is the '*notion*' that having ostensibly out-yielded its parent line Non-GMO (varieties) comparators by 28-37%, (it doesn't matter that they were poor yielders or a defunct National Check), then, this is the proof that the B&B system is a superior hybrid-making technology, which will deliver such superior yields with B&B hybrids of India's best cultivars, high-yielding Non-GMO varietal parent lines, (the result of conventional breeding under AICRP-RP co-ordinated under the DRMR). Or as the Developer states it: These varieties will be used for "*introgressing the bar-barnase-barstar genes into new parental lines to develop the next generation of hybrids with higher yields*". This is how the nation and the PMO have been misled into believing that HT mustard '*somehow*', will reduce India's import bill of oilseeds. Indeed, in his zeal to make this point, the AG may be forgiven for stating that the imports of Canola (rapeseed oil) into India were of the order of Rs 65,000 crores! The AFES document in its Conclusion on page 106 (489) states: "---- *the efficacy evaluation has proven the presence of hybrid vigour in hybrid DMH11*" (against varietal parent lines – clarification by Petitioner) ----- "*and the applicant has successfully demonstrated the use of (barnase-barstar) technology for efficient production of Indian mustard hybrid seed*".

**NOTE:** the field testing data provides no scientific basis to substantiate the claim that the HT hybrid DMH-11 can confer any

additional advantage over the conventional hand-made hybrid VEH2-F1 (Varuna x EH2), (it was mandatory to test against VEH2-F1) and Non-GMO cytoplasmic male-sterile hybrids (CMS, eg DMH-1/NRCHB-506/Coral), in hybrid seed production. These and other appropriate varietal and hybrid checks as 'Comparators' were not used in the trials.

**NOTE:** DMH 11 MSY even at its '*face value*' (because the FT were statistically invalid) of approx 2626 kg/Ha (DRMR data, but may be lower at 2616kg/Ha), fails to deliver/out-perform, both varieties and hybrids (ref IA 47, Annexure M5 (tables 16, 19 and 20)).

The evidence is:

### **8.3 There is no justification or any need for GM/HT-based Hybrid Technology**

- The Barnase-Barstar system has not been shown to be better than handmade conventional hybrids like VEH2-F1 (Varuna x EH2) and the existing Non-GMO CMS system (male sterility), for creating hybrid mustard plants because there have been no tests directly comparing DMH11 with the Non-GMO hybrid systems. Furthermore, this needs to be done in several different sets of mustard parental lines, because male sterility genes are known to vary in their effectiveness in different varieties (lines) of a crop. And finally, these should be tested under different environmental conditions, (and in sufficient nos. of trials) because these also often affect the expression of sterility genes. These experiments have not been carried out in mustard.
- The same is true for the efficiency of the systems for making the hybrids, since these genes sometimes fail under the conditions

mentioned above. So statements claiming that barnase/barstar works better in mustard is purely speculative, not based on science.

**Note:** Therefore, DMH 11 and its 2 HT parental lines are not for yield enhancement. And no claim may be made of the proposed GM barnase-barstar technology for mustard that it produces superior (high-yielding) hybrids. That scientific evidence is quite simply lacking. At best, it only reduces labour requirement in hybrid seed production (for the Developer).

- **Hybrids do not “breed true”:** farmers must purchase them every year to obtain the properties of the hybrid. Becoming dependent on the seed industry can lead to loss of native varieties that contain important genetic diversity needed for future yield gains, pest resistance, response to climate change etc. and increase farmer costs. (Bt cotton is a case in point)
- **The debate is far from conclusive with regard to the superiority of hybrids:** There are serious questions among agri scientists internationally, about whether hybrid yield gains substantially exceed those attainable through breeding of open pollinated varieties, as seen from the RTI data of mustard varieties and a careful examination of corn in the U.S., which is often touted as the epitome of a crop that shows higher yielding hybrids.
- **CMS: A conventional ‘pollination control’ technology:** ‘CMS (cytoplasmic male sterility) is available for exactly the same purpose as that of the ‘GM-barnase-barstar’. Deepak Pental’s group developed a mustard hybrid ‘DMH-1’ using the CMS technology, which was released in 2008, which is a non-GM method, but achieves exactly the same objectives as that of ‘GM-barnase-barstar’.

In his research paper published in 2006 (Theor Appl Genet (2006) 114:93–99; DOI 10.1007/s00122-006-0413-0), Pental claimed that the CMS based non-GM *B. juncea* hybrid (DMH-1) developed with ‘126-1’ cytoplasm has given around 30% heterosis over the best national and regional checks in multi-site trials conducted in the north-western states of India where mustard is grown extensively during the winter growing season.” Further, Pental also claimed that “As the male sterile lines with ‘126-1’ cytoplasm are stable both under long day and short day conditions, CMS ‘126-1’ besides its use in India may also be of value in developing *B. juncea* hybrids for regions where *B. juncea* is grown in the summer season.” But now regulators and developers alike have a changed stand-point that CMS is an unstable technology; and without evidence, that B&B is superior?

- **CMS: Numerous conventional mustard hybrids** are available in the market. There are no constraints in seed production as expressed by private or public sector institutions. It is not at all clear how the GM barnase-barstar technology can improve the situation and why it is needed in the first place: Public-domain literature (no annexure) provides this data:

- a. There are about 20 Non-GM mustard hybrids in the market being sold by private seed companies and about a dozen Non-GM mustard hybrids released by our public sector institutions, currently available in the market. Hybrid seed is moderately priced. One hybrid called 45S42 is the leading CMS hybrid and Coral 432 is also immensely popular.

- b. There is no dearth of commercial hybrids in the market. The GM technology is not designed to create a better hybrid. It only reduces

labour requirement in hand-made conventional hybrids. The following private companies sell NON-GM mustard hybrid seeds in the market.

- c. Pioneer sell three Mustard Hybrids, 45S42, 45S35 and 45S46.
- d. Advanta commands approx. 50% market share of mustard hybrid area with its hybrids Coral 432, PAC 401 and PAC 402.
- e. Proagro sells six mustard hybrids, namely 5111, 5222, 5333, 5444, 5666, 5450 and 5121.
- f. Mahyco sells 'Shraddha MRR 8012'
- g. Furthermore, IARI, DRMR and several agricultural universities have developed mustard hybrids, which are in the pipeline.

- **Variety:** And with regard to a high-yielding variety which outperforms HT mustard DMH 11 (official MSY 2616-2626 kg/Ha) by a significant margin, Sardarkrushinagar Dantiwada Agricultural University released a variety of mustard seed in 2011 that offers yields of 3,000 kg/Ha

**Question:** despite providing 30% heterosis and despite being stable as claimed by Dr Pental, why is it that DMH 1 did not make any difference to mustard yields in the country after its use over the past 8 years from its release in 2008? Why on the other hand, should it *not* be surmised, (on the same inferior evidence as DMH 11), that the claims made for it are identical and are very likely to meet the same fate as that of DMH-1?

**Question:** when the 'conventional CMS technology of DMH-1' is claimed to give 30% heterosis and is claimed to be stable with high genetic purity of DMH-1, where is the need for the 'GM 'Barnase-Barstar'

Technology?

**Conclusion:** When there are so many conventional mustard hybrids available in the market, it is not at all clear how the *GM 'Barnase-Barstar' technology* can improve the situation and why it is needed in the first place? The Developers have not made the case and the Regulators are willing to forego the scientific evidence for such a case. Rather there is great deal of supposition and collusion between Regulators/Institutions of governance and the Developers, of the hypothesis that the B&B system makes superior hybrids, without scientific underpinning, instead HT DMH 11 is being pushed willy-nilly on the nation with force, fraud, fudging.

**9. HT MUSTARD DMH 11 (AND ITS HT VARIANTS) IS A FRIVOLOUS AND DANGEROUS GMO WITH THE STATED REGULATORY INTENT TO DEREGULATE**

Petitioners stated (ref. IA 47) that it *“matters not a jot if HT DMH 11 is not approved. What does matter is that its 2 HT Barnase and Barstar parental lines are”*. By this means and back-crossing, HT DMH versions (of the B&B system) will be deregulated and released to farmers without safety-testing. Respondent 'Reply' confirms this:

**At 62, Page 43:** *“Once the GE mustard events Varuna bn 3.6 and EH2 modbs 2.99 are approved and deregulated, these would be immediately used by the National net-work programme”*.

**9.1 Wrap-up of Evidence**

**a. There is no proof of hybrid-making advantage:** there is no proof to substantiate and no inference can be drawn that HT Mustard DMH 11/the GM Barnase-Barstar system can confer any additional advantage over the conventional hand-made hybrid VEH2-F1

(Varuna x EH2) and Non-GMO cytoplasmic male sterile-based hybrids (CMS). The testing with VEH2-F1, which is mandatory for evidence of any superiority of HT hybrid DMH 11 was not done, nor with other valid '*comparators*', which were also necessary. Norms were comprehensively flouted. The fraud of the field testing is abundantly apparent.

**b. World-wide:** GM rape-producing countries of USA, Canada and Australia, all have yields at the lower end of the scale of between 1280-1480 kg/Ha. But Non-GMO China (with a significant CMS market share), Ukraine & Romania also fall within this range. Haryana, the most important mustard producing area in India outperforms Canada with approx. 1600 kg/Ha, (separate research). France, Germany, Poland and the UK heavily out-yield the GMO countries (with yields around 3000 kg/Ha). Crop productivity is a complex interplay of many factors. But the AFES document and 'Reply' make suppositions and simplistic claims for the success of B&B system in Canada without evidence to support this claim.

**Annexure Q2:** Comparative Yield in GM and Non GM Rape- producing Countries sourced from the FAO.

**c. How can HT DMH11 impact India's edible oil import?** HT (B&B) mustard has not been scientifically proven to be a robust, stable system to deliver better hybrids and is outperformed at a '*face-value*' MSY of 2016-2026 kg/Ha (DRMR Data to the regulators), by India's best cultivars, both varieties and hybrids. It is ludicrous that India's import bill of edible oil (approx. Rs 68,000 crores), of which Canola/HT rape (is only around may be 2%), can be impacted in any

measure by HT mustard DMH11 and its variants, which will not, on present evidence, have any impact as a priority on domestic production! There are a lack of straight logic and hard science in the 'Reply' of the U o I that require scrutiny and are incredible. There is no conceivable connection between HT DMH 11 and attaining self-sufficiency in oil-seeds production. The problem lies squarely with Government Policy and trade issues.

**d. Dr Paroda was a late induction, the 6<sup>th</sup> member of the TEC:** an in-house MoA appointee insinuated into the TEC after its 1<sup>st</sup> report, Dr Paroda is a proven promoter of GMOs and funded by the 'Industry' in this work (ref IA 42 of 2013 Annexures P4 & P6). This Hon'ble Court was gravely misled by this serious breach of its mandate of an independent TEC. During the 'hearing' of 12 November 2012, Petitioners had specifically opposed his induction during oral arguments and this Hon'ble Court had orally stated that these concerns would be looked at, after the TEC's final report is filed (WS pg. 26).

**NOTE:** Dr Paroda's single report does not withstand the 5-Member majority, unanimous Report, which also has Government Nominees in it and also for the added reason of his serious conflict of interest.

**e. Genetic Contamination of our mustard germ plasm is the outstanding issue:** According to the National Bureau of Plant Genetic Resources (NBPGR) "*India possesses rich diversity of oilseed brassicas. Brassica rapa var. toria, B. rapa var. brown sarson and B. juncea considered to be native of Indian gene centre (Arora, 1988)*". India's gene banks have 5477 Brassica juncea ('Indian Mustard') Accessions.



**NOTE:** India's rich genetic diversity in mustard will certainly be contaminated if HT Mustard DMH11 and its variants are commercialised. Isolation distances (employed in FTs) have no meaning. Point-to point seed dispersal by wind and insect-mediated pollen transfer by bees (and bees play a predominant role in India in the pollination of mustard) means that cross pollination occurs over several kilometers.

The contamination of Non-GMO rape/mustard with the Barnase gene (sterile pollen), would be a genetic use restriction for farmers because they would not be self-fertile (ref point 6). And, the B&B technology being specifically a hybrid-making system has further serious implications for mustard diversity in public sector mustard research (DRMR), for developing improved traits in cultivars.

**NOTE:** Yet, like in the case of Bt brinjal, there is supreme indifference by the Regulators on this issue (they were willing for brinjal diversity to be contaminated). How can contamination of India's mustard germplasm be a scientific and responsible response? HT mustard will present an irreversible bio-security risk to our Country.

The Prime Minister made particular reference to this issue in his address to the '*Intl Agro-biodiversity Congress*' on 7 November 2016:

*"Use of technology in agriculture should not be at cost of sustainability, bio-diversity"*. Prime Minister N Modi.

Quite so.

## **10. CONCLUSIONS: THE EPITOME OF THE BLUFF AND SPIN OF THE HT DMH 11 PROCESS**

In a statement of Machiavellian artfulness, in the 'Reply':-

**At 63 pg. 43:** *“Once a robust pollination control mechanism is in place, yield of hybrids can be further improved by breeding better parental lines”.*

The statement is pure spin. Unless deconstructed, it conveys that HT Hybrid DMH11 is a superior hybrid technology that will (alone) provide 25 to 30% higher yield and even better. This is the message believed to have reached the highest levels of political office ie of the Prime Minister. The statement is completely without logic, false and has no scientific meaning. The first half of the statement has no connection what-so-ever with the 2<sup>nd</sup> half. The first half is in fact true of the Non-GM CMS system, not the B&B system for which a scientific case has simply not been made.

As if this were not enough, the ‘Reply’ seeks to indemnify itself of documentary fraud through a *caveat*, stating:

*“---All Observations and analysis by the regulator is based only on the submitted dossier and correct figures and displayed for public view in the AFES document. Any reference to other documents is beyond the purview of safety assessment by the regulators” (ref 92 at pg. 58).*

(This is a reference to the charge of fudging (ref. point 4), where these ‘other’ documents include submissions by the Developers of scientific data that formed the basis for the regulatory approval to test under BRL II and thereafter, the request for commercial approval of *HT DMH 11* and its HT variants.

These are two glaring examples of the evidence of this Rejoinder and earlier Application (IA 47) of the sheer extent of the spin; the unremitting regulatory fraud in an ethically deviant, tyrannical

regulation that is also a subterranean process in 'Contempt of Court', and which defy democratic processes that have Constitutional safeguards. Dr Bhargava in his letter to the Chair of the GEAC (Petitioners Application IA 47 Annexure M2), describes the singular and unconscionable lack of response to a fully professional and technically competent, science-based Presentation on HT DMH11 by CSOs to the GEAC, (on 18 July 2016), which has been comprehensively ignored and side-lined.

**10.1** In the light of these matters, Petitioners respectfully submit that:

- That Dr Paroda's separate report be ignored and the unanimous recommendations of the 5-Member TEC Reports be implemented.
- That the environmental release of any HT GMO including planting for seed production be banned, including immediate up-rooting if planting has been done.
- That a Commission of Enquiry is instituted into the processes and decision-making governing HT DMH11 and its HT variants.

DEPONENT

VERIFICATION:

I, the above named Deponent, do hereby verify that the contents of the above Affidavit are true and correct to my knowledge, no part of it is false and nothing material has been concealed there from.

Verified at New Delhi on this \_\_\_\_day of November 2016.

DEPONENT