

Environmental Release of Genetically Engineered Mustard Hybrid (DMH-11) Developed at University of Delhi Approved

The **Government of India** approved on Tuesday the 25th October, environmental release of the **GM mustard hybrid DMH-11** and its parental lines **Varuna bn 3.6** carrying the **barnase** and **bar** genes and **EH-2 modbs 2.99** carrying the **barstar** and **bar** genes. These lines and the hybrid were developed at the **Centre for Genetic Manipulation of Crop Plants (CGMCP)** and the **Department of Genetics** located at the South Campus of the University under the stewardship of Prof. Deepak Pental (currently SERB National Science Chair), the then Professor at the Department of Genetics and a former Vice Chancellor of DU. The hybrid and the parental lines were developed indigenously



and covered by National and International patents. **This is the second GM crop after Bt. cotton to get environmental clearance in India and the first GM food crop to be approved.** This landmark approval paves the way for hybrid mustard which has ~25-30% higher yield, to reach the farmer's field within an estimated period of 2-3 years. This acceptance is also a positive step toward recognition of genetically engineered crop as a measure for food security.

Heterosis breeding in Indian mustard (*Brassica juncea* L. Czern & Coss): Analysis of component characters contributing to heterosis for yield
Euphytica **69**: 219–229, 1993.
Akshay K. Pradhan, Yaspal S. Sodhi, Arundhati Mukhopadhyay & Deepak Pental

The use of a Spacer DNA fragment insulates the tissue-specific expression of a cytotoxic gene (*barnase*) and allows high-frequency generation of transgenic male sterile lines in *Brassica juncea* L.
Molecular Breeding **8**: 11–23, 2001.
Arun Jagannath^{1,2,*}, Panchali Bandyopadhyay^{1,+}, N. Arumugam², Vibha Gupta², Pradeep Kumar Burma¹ and Deepak Pental^{1,2,*}

US006833494B1

(12) United States Patent
Pental et al. (10) Patent No.: US 6,833,494 B1 (45) Date of Patent: Dec. 21, 2004

(54) REGULATION OF LETHAL GENE EXPRESSION IN PLANTS

(75) Inventors: Deepak Pental, New Delhi (IN); Arun Jagannath, New Delhi (IN); Panchali Bandyopadhyay, New Delhi (IN); Neelakant Arumugam, New Delhi (IN); Vibha Gupta, New Delhi (IN); Pradeep Kumar Burma, New Delhi (IN)

(73) Assignees: University of Delhi, New Delhi (IN); National Dairy Development Board, Gujarat (IN)

Seurinck et al.: The nucleotide sequence of an anther-specific gene. *Apr* 24, No. 11, p. 2403*

Pfister et al., Nucleic Acids Resour Marazi et al., *Indo climatic (Brassica)* 347, pp. 337-341, * Marzi et al., *Isolation Cloning for Antherid. 1987. Plant Physiol. Barnase et al., Expr Expression of a Cb*

RESEARCH ARTICLES

Development of transgenic *barstar* lines and identification of a male sterile (*barnase*)/restorer (*barstar*) combination for heterosis breeding in Indian oilseed mustard (*Brassica juncea*)

Arun Jagannath*, N. Arumugam*, Vibha Gupta*, Akshay Pradhan*, Pradeep Kumar Burma* and Deepak Pental*^{1,2}

*Center for Genetic Manipulation of Crop Plants, University of Delhi South Campus, Buzas Jazira Road, New Delhi 110 021, India
†Department of Genetics, University of Delhi South Campus, Buzas Jazira Road, New Delhi 110 021, India