

India registers plant varieties under PPV&FR Act, 2001

S. Nagarajan, R. K. Trivedi, D. S. Raj Ganesh and A. K. Singh

The Protection of Plant Varieties and Farmers' Rights 2001 came into force in 2005 and procedural details for the registration of 12 species of plants were completed by 2007. Applications were received from May 2007, and so far 168 varieties of various kinds have been registered. Here we present a brief on the same.

In India, the Protection of Plant Varieties and Farmers' Rights (PPV&FR) Act-based variety protection stipulates that a new variety should be novel, which means that it should not have been marketed for cultivation for more than a year at the time when the application for registration is filed. The candidate variety must satisfy the DUS requirements, namely distinctiveness (D) for at least one essential character from what is already known; must have acceptable level of uniformity (U) and stability (S)¹. The general guidelines and crop-specific guidelines issued by the Authority further explain the philosophy, methodology and procedural details to ascertain if a new variety is registerable. The distinctiveness of the candidate variety is evaluated to verify the claims by comparing with near-similar reference varieties, in a field trial conducted at two locations for two seasons. The material should be 'sufficiently uniform', for the reason that uniformity depends on the breeding methodology followed in designing a variety. Lack of uniformity indicates that the material is heterozygous or has admixtures and therefore cannot be stable over generations. Analysis of the visual data scored on distinctiveness and uniformity, and inferring stability forms the basis of registration of the new variety. If the DUS field test is not able to establish that the variety under evaluation is distinct, then if the applicant so desires, special laboratory tests can be conducted (physiological/chemical/molecular tests) to establish that the applied variety is distinct and registerable. The standard laboratory procedures of such special tests are to be made known and the laboratory where it is to be conducted is to be accredited. The material is said to be novel if it has not been marketed for more than a year at the time of filing of application. In other words, varieties that are in public use for more than a year are not registerable as new varieties, as they have become a matter of common knowledge.

Seed deposition requirement

Seed here means the sexually produced true seed and the vegetative propagules of the asexually propagated plants. Each plant species varies in the nature of multiplication of the propagules, their size, planting time and storability characteristics. Individual crop species-specific DUS test guidelines developed by the Authority give details on the amount of seed needed for the conduct of the DUS test. On completing the DUS tests, if the applied variety meets all the requirements of registration, then a part of the original seed supplied is transferred to the National Gene Bank. The seed lot is stored under low-temperature conditions at 5°C for the entire registration period, and if necessary, after few years of storage in the National Gene Bank, the seed lot will be rejuvenated and replenished at the cost of the applicant. The seed stored in the National Gene Bank will be used for dispute settlement or when an exigency arises for invoking compulsory licensing provision. Such a seed deposition in the National Gene Bank would dissuade market malpractices or violations as the sample in custody can be drawn to verify the facts. When the period of registration granted lapses, the material automatically moves to public domain.

Extant variety

Under 'extant variety' the PPV&FR Act, 2001 covers (i) farmers' variety (FV), (ii) variety notified under the Seeds Act, 1966, (iii) variety about which there is common knowledge (VCK) and (iv) any other variety in the public domain. From the date of notification of the species in the Gazette of India, within three years, the extant varieties can be filed for registration. By way of Regulations², DUS criteria for registering FV and VCK have been notified. The DUS test for FV shall

be a multi-location field evaluation for one year. The test shall include comparison with reference varieties and shall be grown in specified number of rows of given length. As the nature of seed maintenance practice of FV is not precise, the level of uniformity will not be like that of a variety maintained by a qualified plant breeder. Farmers knowingly accommodate small variations to keep the variety more adapted to stress. Therefore, in FV, the number of off-types permitted is twice of what has been prescribed for a new variety. The margin provided will in no way interfere with the product quality compared to the price one has to pay for FV. Keeping in view that farmers are still not conversant with the Act, a period of five years has been granted from the time a species is notified, to file FV for registration and through a Gazette notification³ the PPV&FR Rules, 2003 have been amended. FV can get plant breeders' rights for the entire period granted under the law, despite being in the non-commercial seed cycle for a long time. Once registered, a FV rights holder will pay the annual fee for FV to retain the plant breeders rights granted.

Process of extant variety registration

By way of Gazette notification of the PPV&FR Regulations⁴, 2006, an Extant Variety Recommendation Committee (EVRC) was established to periodically meet and evaluate/scrutinize the applications of varieties notified under the Seeds Act, 1966, and recommend to the Registrar those varieties which satisfy registration requirements. EVRC has seven members and the Registrar acts as the member secretary. The Registrar on consideration of the recommendation and other aspects, decides on whether to accord plant breeders rights to the applicant for the residual period of time or not. The passport data of accepted varie-

COMMENTARY

ties are published in the *Plant Variety Journal of India (PVJ)*, a monthly publication of the Authority. After publication in *PVJ*, objection, if any, can be filed by the aggrieved party by submitting in the prescribed format with Rs 1500 fee. By doing so a higher degree of transparency on the application is kept as well as an opportunity to hear from the concerned parties to place their views before the Registrar. On completing these requirements, the registration/protection is granted for the residual period. The breeder of such extant varieties shall enjoy all the rights and privileges granted under the Act, till such a time the annual fee is paid to the Authority.

Many private plant breeders and seed companies market 'truthfully labelled' (TL) seeds under their own reputation guarantee. Varieties sold under the tag 'TL' and the *Bt* cotton transgenics approved by the Genetic Engineering Approval Committee (GEAC) as commercial release are potential materials that can come under VCK. These materials are generally not notified under the provisions of the Seed Act.

For VCK, multi-location DUS field trial of the size prescribed for a new variety has been prescribed and since these are materials already under usage, the testing duration has been reduced to one year. The DUS fee for VCK has been accordingly halved and the registration fee to be paid has been Gazette-notified⁶. It is viewed that the protection period for VCK should take into account the already spent commercial life and for the residual period registration should be accorded.

For the 19 notified crop species⁷⁻⁹ [bread wheat, rice, maize, sorghum, pearl millet, pigeon pea, chickpea, lentil, black gram, green gram, field pea, kidney bean, diploid cotton (two species), tetraploid cotton (two species), jute (two species) and sugarcane], the Authority has so far received 1708 applications. Among these, 1138 are under 'Extant' category (Table 1). Till now under the VCK group about 400 applications covering primarily cotton (about 250) have been received. After examining the applications, many of them have been taken up for field-based DUS test.

After being examined by the Plant Varieties Registry and obtaining relevant information/documents from the applicants, the applications were put up to the EVRC. So far EVRC has examined 415 cases, out of which only 317 applications

have been recommended for registration. The minimum passport data of recommended applications have been published in *PVJ* for calling objections. The applicants have submitted the specified quantity of seed material to the National Gene Bank and a total of 163 extant varieties (notified under Seeds Act, 1966) have been registered under the PPV&FR Act, 2001, and certificates of registration have been issued (Figure 1). Notice was also given in *PVJ* under Section 26 of the Act calling for (benefit-sharing) compensation claim¹⁰, if the material of a breeder had been used without prior approval.

Annual fee payable to the National Gene Fund

Plant varieties have existed even before varietal breeding programmes started in the public and private systems. In other words, the basic genome of modern-day varieties is a continuation of earlier plant variations that were created by farmers or were already there in nature. But for the marginal yield gain that the grower of new varieties gets, there is no pay-back for using the plant genetic diversity that was conserved by farmers, tribals, woman and others living in the agro-

Table 1. Status of the crop-wise 'extant variety' application received since 2007 till 31 May 2010

Crop	2007	2008	2009	2010	Total
Rice	70	94	34	–	198
Maize	74	22	34	–	130
Wheat	47	39	3	–	89
Pigeon pea (tur/arhar)	11	10	3	–	24
Pearl millet (bajra)	65	11	34	–	110
Sorghum (jowar)	23	33	33	–	89
Chickpea (Bengal gram)	13	29	4	–	46
Garden pea (field pea)	12	12	1	–	25
French bean (rajmesh)	3	4	2	–	9
Lentil (masoor)	5	6	2	–	13
Black gram (urad bean)	11	4	7	–	22
Green gram (mung bean)	21	5	13	–	39
Cotton	–	102	209	14	325
Jute	–	16	3	–	19
Sugarcane	–	–	–	–	–
Total	355	387	382	14	1138

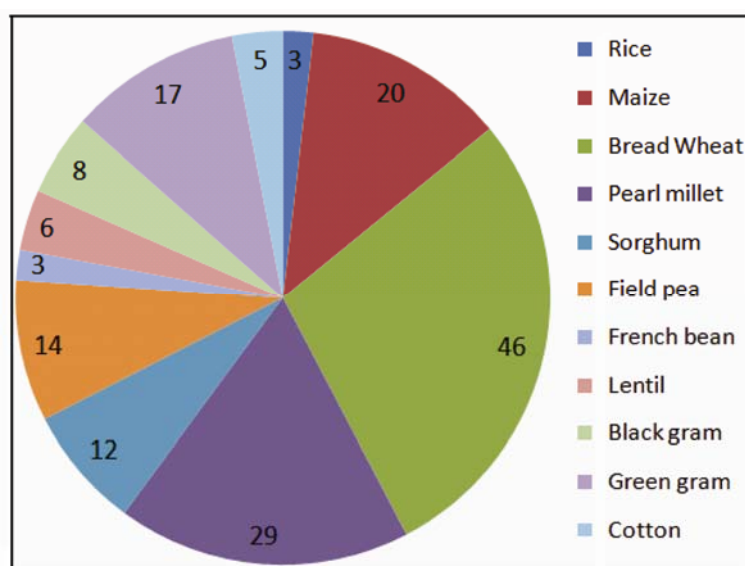


Figure 1. Number of certificates of registration issued under the PPV&FR Act, 2001.

biodiversity hotspots. The annual fee that flows into the National Gene Fund has been structured in such a manner that it sustains and promotes agro-biodiversity in perpetuity to enable variety development for all times to come. Following two national debates and wide consultations, a general agreement was reached which has been notified in *The Gazette of India*¹¹. It can be summarized as follows:

(1) The annual fee for any variety of the genera and species other than extant varieties and FV as specified in clause (a) of Section 14 of the Act shall be Rs 2000 (rupees two thousand only) plus 0.2% of the sales value of the seeds of the registered variety during the previous year plus 1% of royalty, if any, received during the previous year from the sale proceeds of seeds of the registered variety.

(2) The annual fee for the extant variety shall be: (a) For extant variety notified under Section 5 of the Seeds Act, 1966 (54 of 1966), the annual fee shall be Rs 2000 (rupees two thousand only); (b) For extant variety other than the category specified in (a) above, the annual fee shall be Rs 2000 (rupees two thousand only) plus 0.1% of the sales value of the seeds of the registered variety during the previous year plus 0.5% of the royalty, if any, received during the previous year from the sale proceeds of seeds of the registered variety.

Thus India, a signatory to TRIPS of the WTO, enacted in Parliament a *sui generis* law, namely PPV&FR Act, 2001, framed the rules in 2003 and started receiving applications since 2007. Till now 168 certificates of registration have been issued, out of which 163 are for extant varieties notified under Seeds Act, 1966, three for FV and two for new varieties. PVJ is the official notification platform for this Act. Thus, India has effectively put in place an IPR system for plant varieties.

1. The Protection of Plant Varieties and Farmers' Rights Act, 2001. *The Gazette of India*, Extraordinary No. 64 dated 30 October 2001.
2. The Protection of Plant Varieties and Farmers' Rights (Criteria for Distinctiveness, Uniformity and Stability for Registration) Regulations, 2009. *The Gazette of India*, Extraordinary Part II-Section 3-Sub-section (i) G.S.R. 452(E) dated 29 June 2009.
3. The Protection of Plant Varieties and Farmers' Rights (Second Amendment) Rules, 2009. *The Gazette of India*, Extraordinary Part II-Section 3-Sub-section (i) G.S.R. 783(E) dated 27 October 2009.
4. The Protection of Plant Varieties and Farmers' Rights Regulations, 2006. *The Gazette of India*, Extraordinary Part II-Section 3-Sub-section (i) G.S.R. 740(E) dated 7 December 2006.
5. The Protection of Plant Varieties and Farmers' Rights Rules, 2003. *The*

Gazette of India, Extraordinary Part II-Section 3-Sub-section (i) G.S.R. 738(E) dated 12 September 2003.

6. The Protection of Plant Varieties and Farmers' Rights (Amendment) Rules, 2009. *The Gazette of India*, Extraordinary Part II-Section 3-Sub-section (i) G.S.R. 319(E) dated 11 May 2009.
7. *The Gazette of India*, Extraordinary Part II-Section 3-Sub-section (ii) G.S.R. 1884(E) dated 1 November 2006.
8. *The Gazette of India*, Extraordinary Part II-Section 3-Sub-section (ii) G.S.R. 2229(E) dated 31 December 2007.
9. *The Gazette of India*, Extraordinary Part II-Section 3-Sub-section (ii) G.S.R. 1874(E) dated 27 July 2009.
10. *Plant Variety J. India*, 2009, 3.
11. *The Gazette of India*, Extraordinary Part II-Section 3-Sub-section (ii) G.S.R. 2182(E) dated 26 August 2009.

ACKNOWLEDGEMENTS. We thank Dr R. B. Singh, Chairman and Members of the EVRC and participants of the two Round Table Discussions for fixing annual fee held at GBPUAT, Pantnagar and Hyderabad, for their suggestions. We also thank Dopal Roy Choudhury and Dr Ramesh Kumar, National Gene Bank, PPV&FR Act for assistance.

*S. Nagarajan**, *R. K. Trivedi*, *D. S. Raj Ganesh* and *A. K. Singh* are with the *PPV&FR Authority, S-2, A-Block, NASC Complex, DPS Marg, Near Todapur Village, New Delhi 110 012, India.*
*e-mail: sn@nagarajans.net

The drying up of River Ganga: an issue of common concern to both India and Bangladesh

H. S. Sen

A number of hydel projects and other schemes diverting water in the Ganga–Bhagirathi river system upstream to the Farakka barrage act as an impediment to uninterrupted flow of water into the barrage. This is a major reason besides others, including design aspect of the barrage itself, due to which there is fast deterioration of the hydrology of both Hugli–Bhagirathi and Ganga–Padma river systems. To ensure livelihood security in this ecosystem in both India and Bangladesh, there is need for close introspection and appropriate action in a holistic manner to restore the hydrology of the river system.

The ecological sustainability of both South Bengal (below Farakka barrage) in India and almost the entire Bangladesh (command area under the Ganga–Padma river system) is under increasing threat due mainly to unplanned diversion of water in the upstream of the Ganga–

Bhagirathi region under the Indian territory. I propose here that introspection be made and appropriate action taken to ensure uninterrupted flow of water into the barrage to save the ecosystem in both India and Bangladesh.

Neo-tectonic movement

The tidally dominated area (TDA) is located at the tail-end of the Ganga basin. Due to neo-tectonic movement during the 16th–18th century, the Bengal basin had tilted easterly along a hinge