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WORKING GROUP ON BIOCHEMICAL AND MOLECULAR TECHNIQUES, AND DNA-PROFILING IN PARTICULAR

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ORGANIZATION OF SOYBEAN OFFICIAL DUS TRIALS IN BRAZIL BASED ON THE USE OF MOLECULAR MARKERS

Document prepared by an expert from Brazil

1. The National Plant Variety Protection Service – SNPC on the Ministry of Agriculture, Livestock and Food Supply (MAPA), is the national authority for the examination of applications and for granting Plant Breeder's Rights in Brazil.

2. Soybean is one of the most important agricultural commodities in Brazil. In 2010/11 production reached 74 million tons, a figure that increased significantly since the promulgation of the PVP Law in Brazil, in 1997. Nowadays, 863 varieties are registered in the National List, and 612 protected by PBR. About 50 new titles are granted every year, corresponding to one third of the titles granted in one year by SNPC.

3. The narrow genetic base of Brazilian soybean varieties, the relatively large number of protected varieties and the level of variation characteristics, due to the diversity of environments where the DUS tests are carried out for this crop in Brazil, increasingly present difficulties to examine distinctness.

4. The objective of this paper is to report some cases in which molecular markers were used to assist the organization of official trials for assessment of the distinctness of candidate and protected varieties by the SNPC.

5. Candidate variety descriptions are provided by the breeders with the application. The information is included on the database of GAIA software and compared with other varieties in order to identify the most similar ones.

6. SNPC regularly performs trials for post control of protected varieties and to check candidate varieties characteristics as declared by the breeders.

7. Since 2009, all candidate varieties of soybean with applications deposited at SNPC have its DNA profiled with SSR markers and the data generated is stored in a database. For that purpose, a bulk of 50 plants per variety is analyzed for fifteen soybean trinucleotide micro satellite loci. The DNA profiles or fingerprints generated for the candidates and protected varieties are then compared amongst each other in order to check for genetic similarities.

8. For the majority of the cases, the group of selected markers allows the differentiation of samples profiled. When genetic distance between the varieties is small and phenotypic differences are weak these varieties are included in side by side trials, which are followed by SNPC examiners that, after evaluations made on specific stages of the crop, elaborate reports with photographs and field data.

9. Regarding uniformity of the candidate varieties, it is expected that the tested genotypes should be typically homozygote in each loci, e.g. one allele duplicated per loci, as soybean is an autogamous diploid species. When two distinct alleles are observed in one loci, this can be an evidence of residual heterozygosis or mixed lines, and in this cases, additional field tests are needed.

10. In 2010/11, four protected soybean varieties were tested at field trials due to genetic similarity and the distinctness was established after the evaluation of morphological and physiological characteristics.

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