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Development and evaluation of transgenic peanut plants against peanut bud necrosis disease (PBND) under greenhouse and field conditions

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Peanut bud necrosis disease (PBND) is an economically important virus disease of groundnut (*Arachis hypogaea* L.) caused by *Peanut bud necrosis virus* (PBNV) (*Groundnut bud necrosis virus*), a member of genus *Tospovirus* for which no durable resistance has been found among the available germplasm accessions. The use of viral coat protein (cp) / nucleocapsid protein (ng) as a transgene for producing virus

resistant plants is one of the most spectacular successes achieved in plant biotechnology. In the present work about 48 independent transgenic events were produced by using two binary vectors encoding for nucleocapsid protein (NP) gene through *Agrobacterium tumefaciens* and micro-projectile mediated genetic transformation. The progeny of the transgenic plants were challenged with PBNV inoculum at two levels of concentration under P_2 greenhouse conditions. In the T_1 generation, at 1:100 (w/v) concentration of leaf sap inoculum, 24 of 36 events tested exhibited any disease symptoms and did not acquired any virus. However, at higher concentration [1:50 (w/v)] all the 24 lines acquired the virus but the symptoms were delayed by nearly 60 days in six events when compared with the untransformed controls, which showed nearly 100% mortality in seven days after inoculation. Simultaneously, these 24 events were also evaluated under contained on-station fields, which showed similar results. Analysis of the disease severity indicated that six events possessed partial resistance against PBND.

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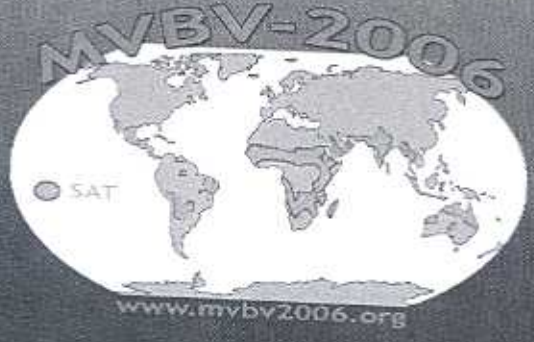

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