

**PERFORMANCE OF ADVANCED POTATO CLONES IN MOISTURE STRESS CONDITIONS IN ARID ZONE OF INDIA**

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Potato is a drought-susceptible crop and when subjected to water stress results in low yield and poor tuber quality. The development of varieties which can maintain their yield under moisture-stress could improve the productivity of areas where irrigation is a limiting factor. In arid zones, drought in combination with high temperature increases the stress to a new level and significant reduction in tuber yield and quality have been observed [2]. Eight advanced clones (392745.7, 392780.1, 397006.18, 399101.1, 301029.18, 380583.8, 388972.22 and 391580.30) received from the International Potato Center, Peru were evaluated along with two varieties Kufri Pukhraj (early fast maturing ) and Kufri Surya (heat tolerant) in an arid sub-tropical region of Western India at Jodhpur during 2012-13 crop season. Five of these clones (392745.7, 392780.1, 397006.18, 399101.1 and 388972.22) were found virus resistant when evaluated in lowland tropics in Peru. The field experiment was laid out in strip plot design with two irrigation regimes: I1= normal Irrigation (eight irrigations) and I2= deficit irrigation (five irrigations) as horizontal factor and ten clones/varieties as vertical factor. Data were recorded on growth, yield and tuber quality attributes at 30, 45, 60, 75 and 90 days. The crop was dehaulmed at 90 days of planting and harvested 15 days later to allow tuber skin set. Drought tolerance index (DTI) was calculated using formulae referred by Hassanpanah [1]. Clone 397006.18 had the highest mean tuber weight per plant (513.7g), which was significantly superior to control Kufri Surya (360.8g) and other two advanced clones 392780.1 (352.3g) and 391580.30 (333.8g). This was also comparable to the control Kufri Pukhraj (483.0g). Severity of moisture stress reduced tuber weight notably and interactions between genotypes and irrigation regime were also distinct. Maximum mean tuber dry weight per plant was also observed in same clone 397006.18 (104.8g) which was significantly higher than both the controls Kufri Pukhraj (76.1g) and Kufri Surya (72.3g). Like other yield attributes, tuber dry weight declined consistently in moderate drought treatment (36.2%) and interactions of irrigation and genotypes were significant. Clone 397006.18 also presented the highest and significantly superior total biomass yield (142.0g). The harvest index (HI) of clone 397006.18 was 0.74 which was at par with other clones and varieties, except for variety Kufri Surya which was higher (0.81). Water stress decreased HI markedly, however, no interactions between irrigation and genotypes were observed. Among all the clones 397006.18 recorded the highest DTI of 1.067. Overall, clone 397006.18 performed best among all the evaluated clones. This clone can further be tested in abiotic stress conditions in other regions to confirm its potential and release as a variety if found promising.

**References**

- [1].Hassanpanah D, 2010. Evaluation of potato advanced cultivars against water deficit stress under in vitro and in vivo conditions. *Biotechnology*.9, 164-169.
- [2].Levy D, 1986. Genotypic variation in the response of potatoes (*Solanum tuberosum* L.) to high ambient temperatures and water deficit. *Field Crops Research* 15, 85-96.