Haryana and Punjab of the our country (India) 2012 - 2017 to assess "economic impact and extent of adoption of improved variety (AHS- 82) of snapmelon " in the region A total of 340 respondents were selected from different category of the farmers/ locale people under different areas/ states under the study. The targeted information / data were collected from respondents and secondary sources/field workers. The area and production of these varieties increased very fast in hot arid regions of India. An extensive study was conducted to assess the impact of adoption of this variety of snapmelon. The study generated the wonderful information/data about the impact of adoption of improved variety (AHS-82) of snapmelon in these states/regions. The area and production under this variety (AHS-82) was only 969 ha and production was 14.34 thousand tons in 2007 which increased to 3562 ha and 52.72 thousand tons, respectively in the year of 2017. The gross return from this improved variety (AHS-82) alone was Rs. 11.76 crores in 2007 which increased to Rs. 43.23 crores in 2017 with the net return of Rs. 8.50 crores in 2007 to Rs. 31.26 crores in 2017 in entire hot arid region of the country (India). It was observed that the net return from the improved variety of snapmelon (AHS-82) in entire hot arid region of the country (India) was 63.14 % and 283.08 % higher in comparison of local variety (local check) of snapmelon during the year of 2007 and 2017, respectively. The adoption and production of AHS-82 is continuing increasing very fast year to year in hot arid regions of the country with high return per unit area of the farmers' fields.

Abstract No. 1650

Evaluation and utilization of nopal (culinary) cactus pear under hot arid ecosystem

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Climate change has become one of the biggest challenges for the sustainable crop production. Prolonged droughts and desertification are the major issues faced by Indian hot arid zone where rural poor and smallholders are most heavily affected. Therefore, the crops which can withstand to such conditions like; drought, high temperatures and poor soils need more emphasis. Cactus crops are gaining increasing interest across the globe, in particular cactus pear or prickly pear (Opuntia ficus indica (L) Mill.) because of its unique characteristics which provide resilience to the harsh ecological conditions. Cactus pear can be grown on land where no other crops are able to grow; it can be used to restore degraded land. It is the only crop that can be relied on when everything else fails. Even today cactus pear is treated as underutilized crop in India, though it has multiple utility. Cactus cladode is rich in pectin, mucilage, minerals, polyphenols, nicotiflorin, vitamins, polyunsaturated fatty acids and amino acids. Cactus nopal pulp has numerous compounds (dietary fibre, vitamin C, phenolic compounds) with the potential to provide important benefits like intestinal, cardiovascular, hepatic health, antioxidant activity and cancer prevention.

Recently micropropagation technique of spine-less, vegetable type cactus pear (nopal cactus) was standardized by ICAR - Central Institute for Arid Horticulture (ICAR-CIAH), Bikaner and its evaluation was done under field conditions. Further several value added and culinary products such as fruit, squash of fruit, pickle, ready to serve drinks, colour from fruit and cochineal, cladodes for culinary and salad based on fruits and nopales/cladodes were explored and demonstrated to several beneficiaries from nopal at ICAR-CIAH, Bikaner for making this crop more remunerative. Now-a-days, it is parts of kitchen gardens in arid and semi-arid regions due to nutritional and medicinal properties. Cactus is alternative resource to

meet the food supply and nutritional health requirements. The field evaluation of this nopal cactus was done with other cactus pear existing germplasm. The cultivation of vegetable type for human consumption is depends on selection of the spineless varieties. The most important species for nopales production is *Opuntia ficus indica* (L.) Mill. It has been proved from the intensive R&D efforts made at ICAR-CIAH, Bikaner that cactus pear can be cultivated successfully in arid region with enhanced nutrition and income from the different products of nopal cactus pear.

Further, round the year production can be taken under low cost green house condition. Under greenhouse, nopales can be harvested regularly at an interval of 15-20 days with an average yield of 1.5 kg tender nopales per plant per year. Thus, the farmer can get regular income from this crop. Evaluation indicated that Rs 150 to 200 per plant per year can be obtained from different fresh products of vegetable nopales, fruits and processed items (such as squash, RTS, pickle, jam, candied products *etc*.) from a full grown plant after 3-4 years of planting. Thus, a farmer can get an income of Rs 500 to 600 per square metre area under green house condition with an estimated benefit cost ratio of 3:1. Thus, nopal cactus is multipurpose and suitable for human consumption for culinary exploitation; other genotypes either suited for animal feed or use as biofencing.

Abstract No. 1660

A study on seed dormancy in cucumber (*Cucumis sativus* L. cv. Pusa Barkha)

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Fresh seeds extracted from cucumber (*Cucumis sativus* L. cv. Pusa Barkha) exhibited high level of dormancy immediately after harvest. Standard germination test on intact and decoated seeds revealed higher percentage of un-germinated seeds in decoated (42.7%) than intact(5%) seeds. Nature of seed dormancy in cucumber was classified as "Morpho-physiological". Among the seed dormancy breaking treatments, 0.02%GA_3relieved dormancy by 94.6% followed by 0.2% KNO_3(75.5%). The increase in germination could be correlated with an increase in the Hydrogen peroxide content due to decreased activity of catalasein the treated seeds. A significant increase in nonspecific peroxidase activity was also observed in seeds treated with GA_3. The critical levels of H_2O_2 that promote germination in cucumber seeds are thus maintained by a concerted synthesis and breakdown action of peroxidase and catalase, respectively. ABA levels decreased in KNO_3 and GA_3 treated seeds along with increasing H_2O_2 levels. This decrease in ABA content in response to dormancy breaking treatments was also accompanied by an increase in GA_3 content in the seeds. The change in ABA/GA balance, rather than absolute hormone status is known to control germination. Gibberellic acid, although required for the completion of germination, is not directly involved in many processes during germination, such as the initial mobilization of seed storage proteins and lipids.