Journal of Plant Development Sciences

(An International Monthly Refereed Research Journal)

Volume 10 Number 12 December 2018

Contents

A REVIEW ON AVAILABILITY, UTILIZATION AND FUTURE OF EGG PLANT GENETIC RESOURCES IN INDIA

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Received-07.12.2018, Revised-26.12.2018

Abstract: Egg plant is one of the most important indigenous vegetable crops of India, cultivated in the tropical and subtropical regions of the world. The global production of the crop has been seriously affected by various biotic and abiotic stresses and development of pest and disease resistance is a major challenge in brinjal breeding. Many wild species of the genus Solanum are available in the country, which have not been efficiently utilized in breeding programs. The present review attempted to gather information on the genetic resources of egg plant available, their distribution, sources of resistance to various pests, diseases and abiotic stresses and opportunities in their utilization for crop improvement programs using conventional and biotechnological interventions.

Keywords: *Solanum*, Genetic resource, Stress, Utilization

FUELWOOD AND FODDER CONSUMPTION FROM AGROFORESTRY AT DIFFERENT ALTITUDINAL ZONES OF GARHWAL HIMALAYA

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Received-01.12.2018, Revised-21.12.2018

Abstract: In Himalayan region, agroforestry is one of the strategies for adaptation to climate change through provision of direct and indirect impact on improving the livelihood of the farmers in the form of productive and protective benefits, respectively. The present study attempts to assess the contribution of agroforestry in fuelwood and fodder consumption at different altitudes of Garhwal Himalayan region. Multistage random sampling method was used for the selection of the agroforestry dominated villages during 2015 to 2017. Fuelwood and fodder consumption by households was estimated in regular interval for a period of 24 hrs using weight survey method. The results revealed that fuelwood consumption from agroforestry was 0.44, 0.63, 0.68 and 0.50 kg/capita/day while the consumption from other sources was estimated at 0.84, 0.90, 0.92 and 1.47 kg/capita/day at <800 m, 801-1200 m, 1201-1600 m and >1600 m altitude, respectively. Similarly, fodder consumption from agroforestry was estimated at 4.70, 5.35, 5.57 and 3.64 kg/ACU/day while the consumption from other sources was 7.16, 6.98, 7.02 and 10.05 kg/ACU/day at <800 m, 801-1200 m, 1201-1600 m and >1600 m altitudes, respectively. The estimated results of the study will be helpful in quantifying the contribution of agroforestry in fulfilling the requirements of fuelwood and fodder. Further the share of agroforestry might assist in framing the policies with respect to the agroforestry adoption as a mechanism for climate change adaptation through the means of protective and productive services as well as by reducing the anthropogenic pressure on forests at higher altitudes.

Keywords: Agroforestry, Biomass, Energy, Fodder, Fuelwood, Garhwal Himalaya

SEASONAL INCIDENCE OF MAJOR INSECT PESTS OF POTATO CROP IN WESTERN U.P

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Received-04.12.2018, Revised-23.12.2018

Abstract: An experiment was carried out under field conditions at the H.R.C of SardarVallabhbhai Patel University of Agriculture and technology, Meerut to study the seasonal incidence of major insect pests of potato crop during 2016-17 and 2017-18.The incidence of aphid, leafhopper and whitefly was recorded during 4th week of January (3rd meteorological standard week), the peak activity of aphid (13.89 aphid/5 plants), whitefly (15.67 whitefly/5 plants) was observed during last week of November (47th meteorological standard week) and the peak activity of leafhopper was observed during first week of December (49th meteorological standard week), respectively. The aphid population showed a significant negative correlation with maximum temperature (T_{max}) r= -0.567, p<0.05, minimum temperature (T_{min}) r= -0.648, p<0.01 and with mean temperature (T_{mean}) r= -0.452, p<0.05. The whitefly population showed a signification positive correlation with maximum temperature (T_{max}) r= 0.654, p<0.01 and mean temperature (T_{mean}) r= 0.678, p<0.01 and minimum temperature (T_{min}) r= 0.569, p<0.01. Whereas a significantly negative correlation was observed with evening relative humidity (RH_{even} r= 0.656, p<0.01 and mean relative humidity (RH_{mean}) r= 0.686, p<0.01. The leafhopper showed a significant negative correlation with minimum temperature (r= 0.583, p<0.05) and evening relative humidity (r= 0.485, p<0.05).

Keywords: Seasonal incidence, Aphid, Leafhopper, Whitefly

Journal of Plant Development Sciences Vol. 10(12)

IMMUNOMODULATORY ACTIVITY OF *CASTELA TEXANA* METHANOLIC-EXTRACT ON THE PRODUCTION OF NITRIC OXIDE IN MURINE MACROPHAGES

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Received-06.12.2018, Revised-27.12.2018

Abstract: *Castela texana* (Torr. & A. Gray) *Rose* is a native plant to the arid regions of northern Mexico, whose medicinal properties includes antipyretic, antiparasitic, antibacterial and immunomodulatory activity. The objective of this work was to evaluate the immunomodulatory activity of the methanolic-extract of *Castela texana* leaf on the production of nitric oxide in murine peritoneal macrophages, since these cells are the major players of the first line of defense of the immune response. The citotoxicity of *Castela texana* methanolic-extracts (10, 100 and 1000 µg/mL) was evaluated with a haemolytic activity model. Then thioglycollate-elicited peritoneal cells were cultured and tested for nitric oxide production, which was determined by Griess method at 6, 12 and 24 h post-treatment within the following experimental groups 1) Negative control supplemented with 2% PBS, 2) Positive control supplemented with 2% LPS extract, 3) Positive control supplemented with 2% complete Freund´s adjuvant, and 4) *Castela texana* supplemented with 2% methanolic-extract 10 µg/mL. The *Castela texana* methanolic-extract showed a high cytotoxic activity so only the lowest concentration (10 µg/mL) was evaluated on the production of nitric oxide in murine macrophages. The *Castela texana* extract triggered a high production of nitric oxide at short times (6 and 12 h) compared to the concentration of nitric oxide induced by the positive controls with LPS and complete Freund's adjuvant. It can be concluded that this extract may act as an acute activator of nitric oxide production in macrophages, settling an antecedent to study the use of *Castela texana* compounds as immunological adjuvants.

Keywords: *Castela texana*, Nitric oxide, Murine macrophages

Journal of Plant Development Sciences Vol. 10(12)

EVALUATION OF ADVANCE BREEDING LINES OF TUBEROSE (*POLIANTHES TUBEROSA* L.) FOR FLOWER YIELD AND QUALITY

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Received-07.12.2018, Revised-27.12.2018

Abstract: Three advance breeding lines 1x6-1, IIHR-12 and An sel-1 were evaluated for two consecutive years along with parents, local check and commercial check for flower yield and quality parameters. Advance breeding line IIHR-12 was found to be superior with better flowering and quality parameters such as the medium tall spike (72.64 cm), longest rachis (28.06 cm), extended flowering duration (190.80 days) number of matured bud on spike (5.31), shorter intermodal length (3.39 cm), low spike weight (54.87 g). IIHR-12 with straight spike buds with pink tinge and attractive star shaped flowers were found to be suitable as cut flower. It was also found to be field tolerant to root knot nematode *Meloidogyne incognita*. Advance breeding line 1 x6-1 was found to be superior to the commercial check Arka Prajwal for traits days to opening of first floret (22.07), flowering duration (185.67), weight of flower spike (79.24g) with straight spikes and flower buds with pink tinge. AN sel-1 has recorded to be superior than the commercial check Arka Prajwal for days to opening of first floret (21.70), number of florets per spike (55.17), diameter of floret (4.69 cm), flowering duration (207.41), number of spikes per clump (5.03). The nature of spike of AN sel-1 was found to be bent with pink tinge on flower buds. The commercial check Arka Prajwal registered superior performance for the traits matured bud weight (1.80g), single flower weight (2.29g) and hundred flower weight (221.04 g).

Keywords: Tuberose, Advance breeding lines, Evaluation, Flower yield, Quality

Journal of Plant Development Sciences Vol. 10(12)

ESTIMATING GROWTH RATES AND DECOMPOSITION ANALYSIS OF MAJOR PULSES IN GUJARAT

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Received-02.12.2018, Revised-22.12.2018

Abstract: India is known for the world's largest pulses sector, producing and consuming diversity of pulses. This paper explores the trend in area, production and productivity of major pulse crops *i.e.* chickpea and pigeon pea grown in Gujarat as well as India. The results showed that the CGRs of area, production and yield over sixteen years (2001-02 to 2016-17) were positive and significant for total pulses in India while, in Gujarat production and yield was increased significantly. Further it was observed that the CGR of area, production and yield of chickpea was positive and significant, whereas in case of pigeon pea the CGR of production and yield was positive and significant in Gujarat. The decomposition analysis concluded that increasing area of chickpea, pigeon pea and total pulse play an important role in increasing production of these crops in India but in Gujarat increasing in yield was increased total production of pulses. Import of total pulses was higher than export of total pulses with 10.48 per cent CGR in India during last twelve years. Whereas, chickpea contribute higher proportion for both total export and import in India. To meet the growing requirement, the country has to produce an adequate amount of pulses as well as remain competitive to keep the domestic production. Overall performance of pulse crops was quite impressive which can be seen by positive growth rate and reduced instability, which is good sign for sustainable agriculture and regional food security.

Keyword: Pulses, Compound growth rate, Instability index, Decomposition analysis, Export, Import

Journal of Plant Development Sciences Vol. 10(12)

UTILIZATION OF WINTER HABIT DONOR, *AEGILOPS TAUSCHII* BY VERNALIZATION AND PHOTOPERIOD MANAGEMENT

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Received-05.12.2018, Revised-26.12.2018

Abstract: Allelic diversity in the wild grass Aegilops tauschii is vastly greater than that in the D genome of common wheat. Numerous efforts have been made to harness this extensive and highly variable gene pool for wheat improvement. This follows two distinct approaches, first production of amphiploids, between *Triticum turgidum* and *Aegilops tauschii*, and second direct hybridization between *Aegilops tauschii* and *Triticum aestivum*; both approaches then involve backcrossing to *Triticum aestivum.* Long duration, winter habit and specific requirements for raising *Aegilops tauschii* often make it difficult for every breeder to utilize the resource in their breeding programme. We demonstrate an easy low cost protocol for raising *Aegilops tauschii*, three times a year to facilitate the hybridization programs.

Keywords: Growth chamber, Faster breeding, Hybridization, Low cost

Journal of Plant Development Sciences Vol. 10(12)

EFFECT OF BEST PLANT BIO-REGULATORS AND MICRONUTRIENT FOR GETTING HIGHER FRUIT SETTING IN MANGO (*MANGIFERA INDICA* L.) CV. AMRAPALI

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Received-02.12.2018, Revised-20.12.2018

Abstract: An investigation was carried out on 19 years old plantation of mango (*Mangifera indica* L.) cv. Amrapali at C.S.A.U.A.&T., Kanpur (U.P.) India, during the year 2013-2014. In all, 15 treatments foliar application of plant bio-regulators and micronutrient were tested in RBD design replicated thrice. The result concluded that pre-harvest application of GA_3 (40 ppm) + $ZnSO_4$ (1.0%) results in significant decrease in fruit drops, increase in fruit retention. The application of NAA (40 ppm) + $ZnSO_4$ (0.5%) results in significantly increase the number of fruits set per plant and minimum fruit set under control.

Keywords: Mango, GA_3, NAA, Zinc sulphate, Fruit drop

Journal of Plant Development Sciences Vol. 10(12)

KNOWLEDGE AND ADOPTION OF RECOMMENDED MAIZE PRODUCTION TECHNOLOGY

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Received-06.12.2018, Revised-25.12.2018

Abstracts: This investigation was carried out in three district of Bastar plateau of Chhattisgarh State to assess the level of knowledge and adoption of recommended maize production technology. 270 farmers were considered as respondents for this study. Respondents were interviewed through personal interview. Collected data were analyzed with the help of suitable statistical methods. The analysis of the results showed that overall knowledge of recommended maize production technology, 72.96% respondents had medium level of knowledge and 73.70% respondents had medium level of adoption regarding recommended maize production technology.

Keywords: Maize production, Knowledge, Adoption, Technology

INFLUENCE OF INTEGRATED NUTRIENT MANAGEMENT PRACTICES ON GROWTH AND SEED YIELD OF INDIAN MUSTARD (*BRASSICA JUNCIA* L.) CULTIVARS

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Received-02.12.2018, Revised-23.12.2018

Abstract: A field investigation was carried out during *Rabi* seasons of 2013-14 and 2014-15 at Crop Research Centre, Sardar Vallabhbhai Patel University of Agriculture and Technology, Meerut (U.P.) to find out the influence of integrated nutrient management practices on growth and yield of Indian mustard (*Brassica juncia* L.) cultivars. Experiment consist five cultivars of Indian cultivars (Pusa Mustard 22 , Pusa Mustard 26, Pusa Mustard 27, Pusa Vijay and Pusa Mahak) and four practices of integrated nutrient management practices (100% RDF, 75% RDF + 2 tonne Vermicompost, 75% RDF + 2 tonne Vermicompost + Bio-fertilizer and 75% RDF + 2 tonne Vermicompost + Bio-fertilizer). The growth and seed yield of mustard significantly influence by different treatments. The maximum dry weight, crop growth rate and seed yield recorded under the cultivar Pusa Vijay with application of 75% RDF+2t VC +Bio-fertilizer whereas maximum plant height were recorded under the cultivar Pusa mustard 27 with application of 75% RDF+2t VC +Bio-fertilizer in both the years years.

Keywords: Growth, Management, Mustard, Nutrient, Seed