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IN VITRO PROPAGATION OF ECONOMICALLY IMPORTANT SOME INDIAN HIMALAYAN MEDICINAL PLANT SPECIES FOR CONSERVATION AND COMMERCIALIZATION

Priyanka¹, Upendra Kumar^{2*}, Anuj Kumar³, Amit Kumar⁴ and Vijai Malik⁵

¹*Department of Botany, Govt. Girls Degree College Kharkhauda, Meerut (UP) INDIA*

²*Department of Molecular Biology, Biotechnology & Bioinformatics, College of Basic Sciences & Humanities, CCS Haryana Agricultural University, Hisar-125004 INDIA*

³*Center for Computational Biology & Bioinformatics, Uttarakhand Council for Biotechnology, Dehradun INDIA*

⁴*Dayalbagh Educational Institute, Dayalbagh, Agra (UP) INDIA*

⁵*Department of Botany, CCS University, Meerut (UP) INDIA*

Email: baliyan.upendra@gmail.com

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Abstract: Medicinal and aromatic plants form an integral and essential part of the lives of hill communities, and the inhabitants depend on these plants for their use. These plants are well known source of active principles in Ayurvedic, Unani and other traditional systems of medicines. Being source of many high value drugs, and ever increasing global demand for the “naturals”, these species are being subjected to reckless, often illegal harvesting, well beyond their natural regeneration capacity. This has led to many species being listed in the Red Data Book or/in various threat categories of International Union for the Conservation of Nature and Natural Resources (IUCN). In order to face such challenges, biotechnological tools (in vitro propagation) can be used for rapid multiplication of elite clones to provide the much needed planting material for cultivation, and thus help in achieving the overall goal of conservation. The present paper deals in with the *in vitro* method being applied for some selected medicinal plants of Indian Himalayan Region (IHR).

Keywords: Conservation, Medicinal Plants, Propagation

IMPLEMENTATION OF BIOLOGICAL CONTROL PRACTICES IN BIODIVERSITY CONSERVATION

Kulvir Sra Dhindsa*

Department of Zoology, DAV College, Chandigarh (India)

Email: Kdhindsa19872@gmail.com

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Abstract: Agriculture is the main source of food, fibre, fuel and other useful products. It provides livelihood and subsistence to the large number of people. Agriculture largely relies upon the biodiversity of the ecosystem for pollination, the creation of genetically diverse plants and crop varieties, development of robust, insect resistant strains, crop protection and water shed control. Land overuse, climate change and chemical pesticide usage are the three important factors responsible for biodiversity loss. It is known that intensified agriculture, particularly the use of chemical pesticides, can suppress and displace local natural enemy populations, often resulting in pest resurgence, experience suggests that natural enemies can survive in such events, probably by exploiting natural habitats and other crops in the local area, and recover when conditions improve. Sustainable agriculture is possible through holistic approach towards crop protection through biological control of crop pests and alternative safe agricultural practices. Biological control is achieved by the introduction of biological material and natural pest control agents into the field by inundation and inoculation or through conservation of already existing beneficial organisms in the ecosystem. Such organisms and their products are manipulated by scientists to achieve a check on harmful agricultural and household pests. Many of them have been commercialized and are effectively used worldwide to achieve the target. Isolation, culture, formulation, conservation and application of better biological control agents for potential use in crop protection, is the need of the hour so that the biological diversity of the planet can be conserved.

Keywords: Biodiversity, Ecosystem, Biological control, Conservation, Sustainable agriculture

EFFECT OF VARIOUS ORGANIC NITROGEN FERTILIZATION ON GROWTH, YIELD AND QUALITY OF *KHARIF* MAIZE (*ZEA MAYS* L.)

Abhishek Shori¹, R.N. Meena^{2*}, Tej Ram Banjara¹, R. Meena³, and M. Bhoi⁴

^{1,2,4}*Department of Agronomy, Institute of Agriculture Science, Banaras Hindu University, Varanasi 221005 UP, INDIA*

³*Department of Soil Science & Agricultural Chemistry, Institute of Agricultural, Sciences, Banaras Hindu University, Varanasi -221005 (U.P.), INDIA*

Email: ramnarayanbhu@gmail.com

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Abstract: A field experiment was conducted to evaluate effect of various organic nitrogen fertilization on growth, yield and quality of *kharif* grain maize (*Zea mays* L.) at agricultural research farm of Banaras Hindu University during *kharif* season of 2015. At the experimentation site soil analysis was done before the sowing of the crop and after the harvesting of the crop. The net plot size was 3.0 m x 2.1 m for row to row and plant to plant spacing was 60 cm and 20 cm, respectively. The experiment was comprised of four organic source methods *viz.* B₁- 100% of RDN as GM, B₂ - 100% of RDN as VC, B₃ - 50% of RDN as GM +F50% VC, B₄- 100% of RDN Through inorganic sources and biofertilizer T₁. Control , T₂- *Azotobacter* , T₃ - *PSB*, T₄ -*PSB* + *Azotobacter*, Maize hybrid TRIPURESHWARI- 4477 was used as an experimental material. The experiment was laid out in split plot design and replicated thrice. Standard procedures were adopted for recording growth, yield and quality parameters. Organic materials (100 % RDN as GM, 100% RDN as vermicompost, 50 % RDN as GM + 50 % vermicompost and 100 % RDN through inorganic source was applied in the field. The significance of the treatment effect was judged with the help of 'F' test (Variance ratio). The difference of the treatments mean was tested using critical difference (C. D.) at 5% level of probability (Gomez and Gomez, 1984). Standard procedures were adopted for recording the data of agronomic and yield related parameters.

Keywords: Organic nitrogen, Biofertilizer, Green manure, Vermicompost, Tripureswari 4411, *Pseudomonas*, *Azotobacter*

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EXPERIMENTAL APPROACH FOR IMPROVEMENT OF SOIL FERTILITY BY DOSE ADMINISTRATION OF CHEMICAL AND ORGANIC FERTILIZERS IN *KHARIF* RICE FIELD

Suwendu Dey¹, Shubhadhip Dasgupta², Sudeshna Mandal² and Sudha Gupta^{1*}

¹*Pteridology and Palaeobotany Section, Department of Botany, Kalyani University, Kalyani-741235, West Bengal, India*

²*All India Coordinated Research Project (AICRP) on Soil Test and Crop Response Correlation, Directorate of Research, Bidhan Chandra Krishi Viswavidyalaya, Kalyani, West Bengal, India.*

Email: sudhaguptain@gmail.com

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Abstract: Experimental approach was taken up by dose administration of chemical (*CDCF-chemical dose commonly used by farmers; CDRA-chemical dose recommended by Agriculture Dept., Govt. of WB*) and organic fertilizers (*ODAC-organic dose using Azolla and cow-dung and ODAO-organic dose by using Azolla only*) in *Kharif* rice field at Chandipur, North 24 Parganas district of West Bengal in two consecutive years (2015 and 2016) for continuous monitoring of the soil fertility by analyzing different physicochemical properties (*texture, water holding capacity, moisture content, pH, EC, organic carbon, organic matter, total Nitrogen, available Nitrogen, Phosphorous, and Potassium*) of soil applicable for measurement of soil health. The comparative assessment of the studied soil parameters depict that among all the administered doses, presently proposed organic fertilizer dose of *Azolla* (900kg/hectare land) and cow dung (3150 kg/hectare land) is proved best for enhancing soil fertility over the years and this should be promoted for sustainable rice farming.

Keywords: *Azolla*, Cow dung, Green revolution, Organic matter, Total Nitrogen, Water holding capacity

TRAINING PROVIDED BY THE KVK AND IMPACT OF DECISION MAKING AND SOCIO-ECONOMIC STATUS OF WOMEN DEVELOPMENT

Uma Rashmi* and R.K. Kushwaha¹

M.P.D.C. Mohanlalganj Lucknow

¹C.S.A. U.A. & T. Kanpur

Email: umarashmiverma@gmail.com.

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Abstract: The krishi viggan Kendra will impact training through work experience and hence will be concerned with technical literacy. The syllabus and programme of each Kendra will be tailored according to the felt needs natural resources and for the rural development. K V K were started for the benefits of rural women, young girls and school dropouts with special emphasis on women. The study was conducted in 3 KVK & each KVK selected two blocks and three villages in each block. Ten respondents (women) were randomly selected from each village. Thus total samples of 180(women) respondents. Approximate women takes participated in KVKS training programme like products daliya making, bari making & papad making programme.

Keywords: Training of KVK, Impact of decision making, Socio- economic Condition

NATURAL REGENERATION STUDY OF FOUR RHODODENDRON SPECIES IN WESTERN HIMALAYA

Shailesh Pd Vashist¹, Tahir Nazir^{2*}, R.K. Pathak³ and S. Nautiyal⁴

¹Department of Botany D.A.V. P.G. College Dehradun

²Deptt. of forestry Dolphin P.G collage Dehradun Uttrakhand, India

³D.A.V. P.G collage Dehradun

⁴Ex. Head Plant physiology Forest research Institute Dehradun Uttrakhand

Email: tahir_nazir@rediffmail.com

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Abstract: Regeneration patterns of species population can address climate change by adaptive evolution or by migrating association to survive in their favorable climate and finally decided to particular forest future. The main aim is to study to know the regeneration status of *R. arboreum*, *R. barbatum*, (2800 masl.) *R. campanulatum*, (3200 masl.) and *R. anthopogon* (3800 masl.) along the altitudinal gradient. In this paper we examined the status of regeneration potential of tree and bushy species in temperate forest, sub-alpine forest, and alpine forest at Kedarnath Wildlife Sanctuary, Tungnath-Chopta in Western Himalaya. To seedling population and distribution, we examine regeneration status in 80 random plots in study area. Total four species of rhododendron genera belonging to Ericaceae family out of which 28 seedlings of *R. arboreum*, 12 seedlings of *R. barbatum*, 23 seedlings of *R. campanulatum* and 33 seedlings of *R. anthopogon* were found in the forest. On the basis of importance value index *R. arboreum* followed by *R. anthopogon* have been found in good regeneration phase in comparison to other two species in the study area. Whereas, *R. barbatum* was found in poor regeneration phase in the study area. *R. campanulatum* and *R. anthopogon* were found above the treeline indicating that the climatic conditions were favourable for their growth. The height, diameter and density of the species differed along the elevational gradient and showed a species specific trend. Regeneration Potential of *R. anthopogon* (33 seedlings) was high in comparison to other three species followed by the second high regeneration potential i.e. *R. arboreum* (28 seedlings). Whereas, regeneration potential of *R. campanulatum* (23 seedlings) was higher in compare to *R. barbatum* (12 seedlings).

Keywords: Kedarnath Wildlife Sanctuary, Regeneration status Treeline, Elevation gradient, Density

GROWTH RATE OF AREA, PRODUCTION AND YIELD OF GROUNDNUT IN RAIGARH DISTRICT OF CHHATTISGARH STATE

Devendra Kurrey*, Bhagchandra Jain, Youraj Singh Rajput and Pratima Dhruw

Department of Agriculture Economics,
Indira Gandhi Agricultural University, Collage Of Agriculture,
Raipur - 492012, Chhattisgarh
Email: devendrakurrey95@gmail.com

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Abstract: Groundnut is an important oilseed crop provides significant sources of cash through the sales of seed, cakes, oil and haulms. Groundnut plays an important role in the diets of rural populations. An attempt has been made in the study to estimate growth in area, production and yield of groundnut in Raigarh district and Chhattisgarh state (1993 to 2013). The growth rate was worked out by using exponential analysis. The area of groundnut in Raigarh district increased by 15.62 hectares from 15.20 hectares in 1993-94 to 30.82 hectares in 2012-13 similarly in case of the state area of groundnut cultivation is decrease by 10.9 hectares from 1993-94 to 2012-13. Actually the good growth by area of this crop may be observed only after 2002 in the district. In the Raigarh district production of groundnut is increased from 20.40 metric tons to 38.28 metric tons during this period of 20 years. Similarly in the state production of groundnut is decreased by 7.2 metric tons during the period of 20 years. The yield of groundnut in Raigarh district and Chhattisgarh state was estimated as 1019 kg and 910 kg during 1993-1994 periods. The yield of this crop is increased about 400 and 550 kg/ha up to year 2012-2013. The compound growth rate of area over the period of 20 years is estimated as 4.837 per cent in the Raigarh district which is significantly increased.

Keywords: Area, Groundnut, Production, Oilseed, Growth rate

PERFORMANCE OF BIO AND CHEMICALS SEED TREATMENT OF BROAD BEAN (*VEICIA FABA L.*) VARIETIES IN CENTRAL UTTAR PRADESH

Ram Pyare, Gautam Veer Chauhan, Ram Ashish Yadav, Harshita Sharma
and Vivek Kumar Trivedi*

Department of Agronomy, *Department of Soil Science and Agricultural Chemistry,
Chandra Shekhar Azad University of Agriculture & Technology, Kanpur- 208002 (UP)
Email: rampyare2012@rediffmail.com

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Abstracts: A field experiments was conducted at Students' Instructional Farm of Chandra Shekhar Azad University of Agriculture and Technology, Kanpur-208002 (UP) during Rabi season of 2016-17. The experiment comprising of twelve treatments was laid out in a Factorial Randomized Block Design with three replications. Treatment comprised three varieties of Bakla (*Vicia faba*) viz., Pant Nagar local, Pusa Palam (Samridhi) and Kanpur local and four bio & chemical seed treatments viz., Malathion @ 3.0 g/kg seed Carbendazim @ 3.0 g/kg seed, Neem Powder @ 250 g/kg seed and Control (water) each treated seed soaked in four hours. The soil of the experimental field was sandy loam in texture with pH of 7.5 and EC of 0.20 mmhos/cm at 25°C. Seed rate of Faba bean @80 kg/ha was row to row spacing 30cm and plant to plant 20cm was sown by country plough on dated: 30.11.2016. Remaining practices were applied as per recommendation. Crop was harvested on March 03, 2017. The results indicated that all observed growth parameters in respect of seed germination, plant height and maximum flowering at all stages were significantly higher under the variety of Pant Nagar local along with bio & chemical seed treatments of Carbendism in present experiment. The yield attributing characters viz., pods/ plant, pod weight/ plant and seed/ biomass weight/ plant were significantly higher in variety of Pant Nagar local with bio & chemical seed treatments of Carbendism in present trail. The Pant Nagar local variety gave higher yield (10.64 q/ha) and straw yield (19.41 q/ha) in comparison to all other varieties. Among the bio & chemicals seed treated the significantly higher seed (11.14 q/ha) and straw yield (16.87 q/ha) was recorded under seed treatments with Carbendism than malathion, neem powder and control seed treatment, respectively.

Keywords: Neem Powder, Carbondazim, Malathian, Varieties of Faba bean

EVALUATION OF SPRAY SCHEDULE INVOLVING FUNGICIDE, COMMERCIALY AVAILABLE BOTANICAL AND ITK ON CURVULARIA LEAF SPOT OF MAIZE FOR YIELD AND QUALITY PARAMETERS

Vidya Palaki* and P.V. Patil

Department of Plant Pathology, College of Agriculture, Vijayapur-586 101

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Abstract: Highest per cent increase in grain yield over unsprayed control was recorded in the spray schedule hexaconazole @ 0.1 per cent - hexaconazole @ 0.1 per cent (52.80) followed by carbendazim + mancozeb @ 0.2 per cent - wanis @ 0.5 per cent (28.80), hexaconazole @ 0.1 per cent - wanis @ 0.5 per cent (26.74), and carbendazim + mancozeb @ 0.2 per cent - carbendazim + mancozeb @ 0.2 per cent (24.61). Least per cent increase in grain yield over unsprayed control was observed in spray schedule wanis @0.5per cent- wanis @0.5 per cent (10.34). The highest B: C was obtained with spray schedule hexaconazole @ 0.1 per cent - hexaconazole @ 0.1 per cent (1:3.81) followed by hexaconazole @ 0.1 per cent - wanis @ 0.5 per cent and carbendazim + mancozeb @ 0.2 per cent - wanis @ 0.5per cent both were recorded B:C (1:2.81). Most of the remaining spray schedules treatments, T₄, T₇, and T₂ recorded next highest B: C of 1: 2.71, 1:2.69, 1: 2.43 and 1: 2.42, respectively. Least B: C of 1:2.18 was recorded in unsprayed control.

Keywords: ITK, Botanical, Maize, Spray schedule

WOMEN EMPOWERMENT THROUGH SELF-HELP GROUPS IN VIDISHA DISTRICT OF MADHYA PRADESH

Aparna Jaiswal*, Arvind Kumar Saxena¹ and Chandrika Sharma²

College of Agriculture, Balaghat, JNKVV(Jabalpur)
^{1,2}*College of Agriculture, Ganjbasoda, JNKVV(Jabalpur)*

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Abstract: Self-help Groups (SHGs) are pioneer for success of community development. It's not exaggeration if we say that they are the milestone for covering up the status and position of women which was lacking since independence. It is one of the important platforms for addressing the gender issues of economic development in its best possible way. The SHGs are not only providing access to financial services but also develop the sense of understanding about the market workings and informing the women members about the numerous welfare programmes. Therefore, Self-help Groups are the important key for women empowerment. Keeping these things in view the study was conducted to determine the extent of empowerment of rural women members through SHGs in Vidisha block of Vidisha District of Madhya Pradesh in 2016 by interviewing 60 rural women from 10 Self Help Groups. Maximum number of respondents belongs to medium category of overall empowerment. The main purpose of joining Self help group is to get loans and to promote their savings. Lack of encouragement, Lack of social mobility and income derived was too low were the major personal problem, social problem and economic problem observed by the respondents.

Keywords: Self help groups, Women empowerment