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ECONOMICS OF PROCESSING OF REDGRAM (*CAJANUS CAJAN L.*) IN NORTH KARNATAKA

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Abstract: Redgram is largely grown in northern part of the state especially in Kalaburgi district, which is called as “pulse bowl” of Karnataka. Based on the highest production of redgram, Kalaburgi and Vijayapura districts were selected and proportionate sampling procedure was followed to select the processing units. From both the districts 22 processing units were selected for the study. Total quantity of raw materials procured by redgram processing units was around 1,054 quintals of redgram and 6.39 quintals of oil with the each time procurement of 28 to 30 times per year. Everyday minimum 25 persons were required to run the redgram processing units. Redgram processing units had processed 31,636 quintals of redgram annually and total capacity utilization was 55.62 per cent. The total cost of processing of redgram to one quintal of dal was ₹ 6174, out of which the total variable cost was ₹ 6,125 per quintal and total fixed cost was ₹ 49 per quintal. The major problems faced by processors in production of tur dal were high price of raw materials, high transportation cost, lack of availability of sufficient raw materials, high moisture content of the raw material and improper quality of raw materials.

Keywords: Procurement, Human resource management, Capacity utilization, Cost of processing, Redgram

EFFECT OF POPLAR (*POPULUS DELTOIDS*) SHELTERBELT ON THE YIELD OF AGRICULTURAL CROPS AND SOIL PROPERTIES IN SEMI ARID REGION OF HARYANA

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Abstract: The study was conducted in 2 year old east-west and north-south directions bund plantation at CCS HAU, Hisar during 2016-2017 to evaluate the effect of *Populus deltoides* bund planting on the yield of agricultural crops and soil properties in Haryana. Total biomass yield of dhaincha was recorded non significant at different distance from tree line of both east-west and north-south planted rows of eucalypts. Different aspects also had no significant effect on total biomass yield of dhaincha. Same pattern of grain yield of wheat (*T. aestivum*) was recorded in both east-west and north-south planted eucalypts. Poplar planted in east-west direction has attained 8.8 cm girth and 8.7 m height whereas in north-south direction it has attained girth of 3.9 cm and height of 6.0 m. The soil organic carbon and available N, P and K content were recorded maximum in bund planted poplar compared to control in different aspects.

Keywords: Crops, Poplar, Soil, Region Yield

YIELD POTENTIAL ASSESSMENT OF FINGER MILLET GERMPLASM ACCESSIONS IN BASTAR PLATEAU AGROECOLOGICAL ZONE

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Abstract: A preliminary grain yield evaluation trial involving 100 germplasm accessions of finger millet was conducted at Research cum Instructional Farm, SG College of Agriculture and Research Station, Jagdalpur, IGKV, Raipur, Chhattisgarh during *Kharif* 2018-19 crop season. The tillers number per plant arrayed between 1 to 4.4 (adjusted mean of five random plant average) over the test accessions and 1.8 to 2.2 among the check varieties. Genotype GEC147(4.4 tillers) followed by GEC127 (4.3), GEC352 (4.0), IC0477591 (3.7) and IC0477601 (3.5) were identified as high tillering accessions. Length of longest finger varied from 3.52 to 13.27cm among test accessions whereas, its distributed between 7.23 to 11.52cm among check varieties. In pursuance of DUS descriptors, 34% of genotypes exhibited long fingers, 51% medium length fingers and remaining had short finger size. The finger width at widest point had range between 0.41 to 1.33cm among all the test accessions, which were basically germplasm, but in case of established cultivars (or local checks) it was relative stable i.e., 0.96 to 1.07cm. Comparison of percent grain yield superiority over best check revealed that only one genotype GEC132 out yielded (423.5g) the best check variety GPU67 (418.3g), but the value was non-considerable i.e., 1.24%. However, statistical comparison of critical difference ($CD = p \leq 0.05$) showed that seven genotypes had similar performance as that of best check. These were GEC132, GEC11, GEC122, IC0476378, IC0477650, IC0477591 and IC0477406 and therefore, can be concluded as findings of the present work.

Keywords: Upland agriculture, Genotypic effect, Grain yield, Finger millet, Germplasm

IMPACT OF FRONTLINE DEMONSTRATIONS ON CHICKPEA (*CICER ARIETINUM*) PRODUCTION, PRODUCTIVITY AND PROFITABILITY IN TRANSITIONAL PLAIN OF INLAND DRAINAGE ZONE OF RAJASTHAN

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Abstract: Pulses are well known richest source of vegetable protein and poor man's food because of its essential component of diet. The frontline demonstrations of chickpea crop was carried out by Krishi Vigyan Kendra, Nagaur-I, Agriculture University, Jodhpur during rabi seasons from 2011-12 to 2019-20 on 178.5 ha area with 382 demonstrations in different clusters of Nagaur district of Rajasthan. The results shows that demonstrations produced on an average 18.02 q/ha grain yield of chickpea, which was 24.18 per cent higher as compared to prevailing farmers practice (14.51 q/ha). The front line demonstrations fetched more average gross returns (Rs.60161/ha), net return (Rs. 37963/ha) and B:C ratio (2.76) with slightly higher investment on cost of cultivation (Rs.1663/ha) as compared to farmers practice. The increase in gross and net returns was in the tune of Rs.11960 and Rs. 10285 per hectare with incremental benefit: cost ratio of 0.33. The average extension gap, technology gap and technology index was 350kg/ha, 608 kg/ha and 25.2 per cent, respectively. It is also observed that majority of the respondent farmers expressed high (51.83%) to the medium (32.72%) level of satisfaction regarding the performance of chickpea under demonstrations.

Keywords: Chickpea, Front Line Demonstrations, Gap, Return, Satisfaction, Yield

ASSESSMENT OF GENETIC VARIABILITY, CORRELATION AND PATH ANALYSIS FOR CANE YIELD WITH ITS COMPONENT TRAITS IN EARLY MATURING SUGARCANE CLONES

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Abstract: Twenty five early maturing sugarcane clones were evaluated in randomized block design with three replications at research farm of CCS Haryana Agricultural University, Regional Research Station, Uchani, Karnal during *spring season*, 2020-21. The objective of the investigation was to study genetic variability, correlation and path analysis for seventeen characters among twenty five diverse early maturing sugarcane clones. Significant differences were observed among the genotypes for all the characters studied. The higher magnitude of genotypic (GCV) and phenotypic coefficients of variation (PCV) was recorded for traits like number of tillers at 120 DAP, single cane weight, cane length, CCS (t/ha) and cane yield. High heritability coupled with high genetic advance as percentage of mean was recorded for number of tillers at 120DAP, single cane weight, cane length, CCS (t/ha) and cane yield suggesting preponderance of additive gene action in the expression of these characters. Cane yield showed significant and positive correlation with number of tillers at 120DAP, number of shoots at 240DAP, number of millable canes at harvest, single cane weight, cane length, cane girth and CCS (t/ha.) at both genotypic and phenotypic level. Path analysis revealed that sucrose % at 8 months showed highest positive direct effect on cane yield followed by CCS % at 10 months, CCS (t/ha), single cane weight, number of millable canes at harvest, purity % at 8 months and number of tillers at 120DAP. These characters merit special attention in formulating selection strategy in sugarcane for developing high yielding and early maturing sugarcane clones.

Keywords: Sugarcane, Genetic variability, Heritability, Correlation, Path coefficient analysis

EFFECT OF IRRIGATION SCHEDULES AND BALANCED FERTILIZATION ON GROWTH AND PRODUCTIVITY OF TARAMIRA

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Abstract: A field experiment was conducted to study the impact of irrigation levels and balanced fertilization on growth parameters and yield of taramira [*Eruca sativa* (L.) Mill] during *rabi* season of 2017-18 at Agronomy Farm, S.K.N. College of Agriculture, Jobner. The experiment comprising three levels of irrigation (one irrigation at branching stage, two irrigation at branching and flowering and three irrigations at branching, flowering and pod formation stage) and five treatment comparisons for balanced fertilization (control, N_{30} , $N_{30} + P_{15}$, $N_{30} + P_{15} + K_{30}$ and $N_{30} + P_{15} + K_{30} + S_{40}$ kg/ha) there by making 15 treatment combinations was laid out in split plot design and replicated four times. Results showed that two irrigations the first at branching and the second at flowering stage significantly increased the growth characters viz., plant height at harvest (118.6 cm), dry matter accumulation at harvest (172.59 g/metre row length), chlorophyll content (0.991 mg/g), LAI (1.05), CGR during 60 DAS-at harvest (2.820 g/m/day), grain (1199 kg/ha), straw (3344 kg/ha) and biological (4543 kg/ha) yield of taramira. Although, three irrigations increased the yield over two irrigations but the increment was statistically not significant. Results further revealed that fertilization with nitrogen and phosphorous in taramira brought significant improvement in all the growth characters, grain (1153 kg/ha) straw (3095 kg/ha) and biological yields (4248 kg/ha) over control. Increase in growth parameters and yield owing to application of potassium as well as sulphur over N and P remained marginal.

Keywords: Growth, Fertilization, Flowering, Irrigation, Nitrogen, Taramira

FIELD BIO-EFFICACY OF FLONICAMID AGAINST SUCKING INSECT PESTS OF SOYBEAN (*GLYCINE MAX* (L.) MERRIL)

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Abstract: The experiment was carried out during 2018-19 and 2019-20 at Instructional and Research Farm, KrishiVigyan Kendra, Mandsaur, in randomized block design with three replications. The soybean variety JS 20-29 was sown on 20/06/2019 in first season and 22/06/2020 in second season with spacing of 45X 10 cm. All the standard agronomical practices were adopted for growing the crop. Three doses of flonicamid 50% WG @ 75, 100 and 125 g.a.i^{ha}⁻¹, ethion 50% EC @ 750 g.a.i^{ha}⁻¹ and profenophos 50 % EC @ 500 g.a.i^{ha}⁻¹ were applied twice against aphid (*Aphis gossypii*), jassid (*Amrascabi guttulabiguttula*) and whitefly (*Bemisia tabaci*) in morning hours at 15 days interval at the ETL level of pests. The sucking pest population was recorded before first spray and at 3, 7 and 14 days after each spray on randomly selected five plants per plot and three leaves per plant and averaged during both the seasons. The overall per cent population reduction over control was calculated from last observation of second spray. Finally plot wise grain yield was recorded and converted into kg/ha. All the collected data was averaged and analyzed statistically using suitable transformation. The highest dose of flonicamid 50% WG @ 125 g.a.i^{ha}⁻¹ exhibited highest efficacy in all the intervals of both sprays during both the years with maximum population reduction (96.68 % and 97.14%) followed by second highest dose of flonicamid 50% WG @ 100 g.a.i^{ha}⁻¹ (94.56% and 95.51%) and third dose of flonicamid 50% WG @ 75 g.a.i^{ha}⁻¹ (90.63% and 88.98 %), respectively against aphid. Rest of the insecticides comparatively showed lesser population reduction. Similar trend of efficacy was recorded against jassid during both the years as flonicamid 50% WG @ 125 g.a.i^{ha}⁻¹ (100% and 100 %) showing non-significant difference with flonicamid 50% WG @ 100 g.a.i^{ha}⁻¹ (96.15% and 100%) and followed with flonicamid 50% WG @ 75 g.a.i^{ha}⁻¹ (88.46% and 85.71 %), respectively. Maximum whitefly population reduction was observed in flonicamid 50% WG @ 125.00 g.a.i^{ha}⁻¹ (95.74 % and 93.98 %) and little difference with flonicamid 50% WG @ 100 g.a.i^{ha}⁻¹ (92.55% and 92.13%) followed by flonicamid 50% WG @ 75 g.a.i^{ha}⁻¹ (85.11 % and 84.26%), respectively. During first and second season per cent increase in yield was noted with flonicamid 50% WG @ 125.00 g.a.i^{ha}⁻¹ (62.53 % and 58.20 %) followed by flonicamid 50% WG @ 100 g.a.i^{ha}⁻¹ (55.65% and 51.16 %), respectively.

Keywords: Flonicamid, Bio-efficacy, Aphid, Jassid, Whitefly, Assessment

IMPACT OF FOLIAR NUTRITION AND HORMONAL APPLICATION ON THE STATUS OF SOIL APPLIED NUTRIENTS IN RICE FALLOW COTTON

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Abstract: A field experiment was carried out to analyze and critically evaluate the foliar fertilization of plant growth hormones and foliar nutrients in rice fallow cotton. The field experiment was conducted in a rice fallow condition with 11 treatments which were replicated thrice in Randomized block design (RBD). The impact of foliar fertilization in cotton through NAA, Fantac plus, Mepiquat chloride and TNAU cotton plus were statistically analyzed by means of growth, yield, nutrient uptake, and availability of nutrients in soil. The treatment, foliar application of NAA @ 40 ppm at flowering and Fantac plus @ 1ml l⁻¹ at boll formation stages (T₈) resulted in increased growth and yield components, as a result, they recorded maximum uptake of nutrients NPK while holding the minimum soil available NPK status.

Keywords: Rice fallow cotton, NAA, Fantac plus, Nutrition uptake, Soil

STUDIES ON GENETIC VARIABILITY PARAMETERS IN MUNGBEAN (*VIGNARADIATA* L.)

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Abstract: Mungbean is a very important pulse crop and development of new varieties with desirable traits forms an important breeding objective. Evaluation of germplasm for yield and yield contributing traits is crucial to know the variability and their exploitation in the breeding programmes. In the present study, 48 genotypes were evaluated for different yield and yield characters. Analysis of variance for all the traits was significant revealing availability of sufficient variability for these traits in the studied material. The genotypic coefficients of variation for all the characters studied were lesser than the phenotypic coefficients of variation indicating the presence of interaction between genotypes with environment. Wide genetic variability was observed for the characters viz., pod length, seeds/pod, where as it was narrow for the characters viz., days to 50% flowering, plant height, clusters/plant, branches/plant, pods/plant, days to maturity and yield/plant. High heritability with high genetic advance as per cent of mean was recorded for plant height, clusters/plant, branches/plant, seeds/pods, pods/plant and yield/plant indicating the preponderance of additive gene action in the inheritance of these traits and offers the scope for further improvement through simple selection procedures. High heritability coupled with low genetic advance as per cent of mean was observed for days to maturity indicating the role of non-additive gene action in the inheritance of this trait and the non-additive component may be exploited through heterosis breeding. The traits, plant height, clusters/plant, branches /plant, pods/plant, seeds/pod and yield /plant indicated the preponderance of additive gene action in their expression and can be exploited using direct simple selection.

Keywords: Genetic advance, Heritability, Mung bean, Variability

NUTRI-GARDEN: A WAY FROM FOOD PRODUCTION TO NUTRITIONAL SECURITY FOR TRIBAL COMMUNITY IN ALWAR DISTRICT (RAJASTHAN)

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Abstract: Tribal communities have less awareness about nutritional food which lead to higher number of malnutrition people among them especially the tribal farm women. Tribal farm women have all the resources for cultivation but lack of knowledge make them vulnerable people for nutrition. Therefore, Krishi Vigyan Kendra, Navgaon (Alwar-I) trained tribal women and introduced them to the concept and establishment of nutri-gardens, also provided nutri garden vegetable kits along with fruit trees. The main objective of introducing the concept of nutri-gardens was to encourage tribal women to cultivate healthy food crops in their home backyards. The KVK Alwar-I conducted nutri garden FLD for promotion of vegetable and fruit consumption by the tribal community during 2018-19 to 2020-21. For this study, 150 tribal farm women were selected as respondent who had established and maintain nutri garden at their own place. It found that, training and demonstrations by KVK scientists on nutri garden model help to increase knowledge of respondents on every aspects of establishment of nutri gardens. In this model, The vegetables selected by taking care of balance nutrition for family and also getting a basket of food with diversity. Nutri garden has all types of vegetables from leafy vegetables to spices for covering all nutritional demand of tribal families. This research highlights that nutri garden can provide throughout year green and fresh vegetables to families. Thus we can say Nutri-Garden is an easiest way from food production to nutritional security for tribal family in the district.

Keywords: Nutri-Garden, Nutritional security, Tribal community, Crop diversity, Kitchen garden

STUDIES ON BIOLOGY OF RED PUMPKIN BEETLE (*AULACOPHORA FOVEICOLLIS* LUCAS) UNDER ODISHA CONDITION, INDIA

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Abstract: An experiment was done to investigate the biology of the red pumpkin beetle, *Aulacophora foveicollis* (Lucas) under laboratory conditions. Sweet gourd plants were used as the host plant for studying the biology of the test insect. It was found that female red pumpkin beetle laid 118 to 184 eggs with an average of 142.3 ± 30.9 . The oviposition period varied from 8 to 12 days with an average of 11.7 ± 1.2 days. The average length and breadth of egg at 1st, 2nd, 3rd and fourth instar larva and also pupa were 0.85 ± 0.08 mm and 0.70 ± 0.03 mm, 3.00 ± 0.12 mm and 0.51 ± 0.06 mm, 5.67 ± 0.44 mm and 0.55 ± 0.08 mm, 8.77 ± 0.18 mm and 0.83 ± 0.09 mm, 12.67 ± 0.88 mm and 3.07 ± 0.18 mm, 6.37 ± 0.29 mm and 115 ± 0.18 mm, respectively. The incubation period, larval period, and pupal period were 12.53 ± 0.1 days, 17.674.33 days, and 13.38 ± 0.31 days, respectively. The average lifespan of adult males and females was 40.67 ± 0.66 days and 47.33 ± 3.06 days, respectively.

Keywords: Red pumpkin beetle, Odisha, Vegetables

EVALUATION OF THE PRODUCTIVITY FOR CHICKPEA (*CICER ARIETINUM* L.) THROUGH CLUSTER FRONTLINE DEMONSTRATION IN FARMERS FIELD IN DHAR DISTRICT (M.P.)

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Abstract: The cluster frontline demonstration (CFLDs) on chickpea was conducted by Krishi Vigyan Kendra, Dhar during the rabi season of 2016-17 to 2018-19. The results revealed that improved seed of JAKI – 9218 + seed treatment with ((2g Thiram + 1g carbendazim kg/seed) + Rhizobium + P.S.B.@ 5g per kg of seed) + plant protection (Pheromone trap 3 no./acre+ insecticide) recorded average highest yield 17.50 q/ha followed by 12.90 q/ha in control plot. The same trend was found in case of gross and net monetary returns, which was Rs. 94,788/- and Rs. 70,745/- ha and for control Rs. 68931/- and Rs. 48098/-ha respectively. Benefit cost ratio for demonstration and control was 3.96 and 3.32, respectively. The extension gap ranging between 4.29 to 4.86 q/ha. Data on technology index reduced from 12.5 percent (2016-17) to 13.4% (2018-19), exhibited the feasibility of technology demonstration in this region. It can be concluded that the pulses production could be enhanced by encouraging the farmers through adoption of recommended technologies which were followed in the CFLDs.

Keywords: CFLDs, Chickpea, Extension gap, Technology gap

ASSESSMENT OF IPM TECHNOLOGY FOR MANAGEMENT OF FRUIT FLY (*CARPOMYIA VESUVIANA* COSTA) IN ALWAR DISTRICT OF RAJASTHAN

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Abstract: The experiment was carried out to evaluation of technological gap and performance of integrated pest management (IPM) against the Ber fruit fly, *Carpomyia vesuviana* Costa (Diptera: Tephritidae) with using deep summer ploughing, clean cultivation with two foliar application of Dimethoate 30 EC @ 1ml/ltr in 0.5% Jaggery with establishment of Pheromone (*Methyl eugenol*) trap @ 25 traps/ha at time of flower formation and fruit set at farmers field condition. This experiment was conducted in on farm trials (OFT) at ten farmers field of Shekhambas and Ramgarh villages of Alwar district (Rajasthan) during period of two years (2019-20 and 2020-21). The fruit fly infestation was recorded lowest (pest infestation 12.37 %) when, using deep summer ploughing, clean cultivation with two foliar application of Dimethoate 30 EC @ 1ml/ltr in 0.5% Jaggery with 25 Pheromone (*Methyl eugenol*) trap per ha. Maximum infestation pest damage (56.24%) was observed in traditional farmers practice (FP), the adoption of recommended production technology and plant protection measures of ber was poor. The main objective of the OFT was to conduct extent of technological gap between recommended and actually adopted ber fruit fly management technologies by the ber growers in Alwar district of Rajasthan. The OFT was effective in changing attitude, skill and knowledge of IPM approach and ber fruit yield increased upto 42.43 percent more over the farmers practice. Results indicate that IPM approach received higher net income by Rs. 268164 /ha as compare to FP (Rs. 206518 /ha).

Keywords: Ber, Fruit Fly, *Carpomyia vesuviana* Costa, IPM, OFT

ROLE OF CLUSTER FRONT LINE DEMONSTRATIONS ON YIELD AND ECONOMICS OF MUSTARD (*BRASSICA JUNCEA* L.) IN NAGOUR DISTRICT OF RAJASTHAN

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Abstract: Front line demonstration is an appropriate means for demonstration as well as transfer of improved agricultural innovations to the farming community. Under centrally sponsored schemes on oilseed production technology under NFSM schemes, KVK Maulasar conducted 478 demonstrations on different variety of mustard during *Rabi*, 2015-16 to 2019-20. The critical inputs were identified in existing production technology through discussion with farmers and on the basis of soil sampling. Lack of plant protection measures were the predominant identified causes of low productivity of oilseed crop in district Nagaur. In the same sequence the other parameters like technological impact, economical impact and extension gap were analyzed for impact assessment of cluster frontline demonstrations (CFLDs) on mustard crop. The results of five consecutive years study revealed that the average yield under demonstration plots was obtained 17.18 q/ha as compared to 14.66 q/ha in farmer plots. The average technology gap, extension gap & technological index were found 318 kg/ha, 312 kg/ha and 14.35 percent, respectively. Further, data showed that the average additional cost of cultivation (Rs. 2269/ha) under integrated crop management demonstrations and has fetched additional net returns of Rs. 14031 per hectare with incremental benefit: cost ratio of 0.35. The results clearly indicate the positive effect of CFLDs over the existing practices.

Keywords: Economic analysis, Extension gap, Technology gap, Technology index, Yield

RESPONSE OF *RHIZOBIAL* STRAINS ON BIOCHEMICAL TRAITS AND NUTRIENT UPTAKE IN MUNGBEAN (*VIGNA RADIATA* L. WILCZEK) UNDER MOISTURE STRESS

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Abstract: The present study was conducted to assess the biochemical responses and nutrient uptake in response to *rhizobial* inoculations in mungbean, and to screen the *rhizobial* isolates for drought tolerance. A field experiment was designed in randomized block design and replicated thrice during *kharij* 2016 at Crop Physiology Field Area, CCS, Hisar. The experiment consisted of two levels of treatments (1) without inoculation (only RDF) and (2) with inoculation (RDF with combination of five *rhizobial* strains viz. *Vigna* 703 + PSB strain P-36, MR 63, MR 54, MB 17a and MH 8b2) and two environments i.e. rainfed (no post sowing irrigation) and irrigated. Membrane stability index, leghaemoglobin content, chlorophyll content reduced by 17.7 %, 24.5% and 2.9% resp. under rainfed conditions while the plants inoculated with *rhizobial* isolate MR63 and MB 17a showed greater chlorophyll content (20.2% and 16.2%), LHb (29.1% and 22.9%) and MSI (19.4% and 17.9%) and enhanced nutrient uptake over RDF.

Keywords: Biochemical traits, Drought, Mungbean, Nutrient, Rhizobia

VALUE ADDITION OF *OCIMUM BASILICUM* L. FOR THE PREPARATION OF TRADITIONAL CRUDE SALT AND ITS MEDICINAL USES

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Abstract: The crude salt (Hara namak) is prepared by local inhabitants of district Solan in Himachal Pradesh using *O. basilicum* L. along with several other ingredients, and uses it to add flavour to their food as well as to cure several stomach ailments. The paper describes the indigenous method of preparation of this salt and its uses in different parts of Himachal Pradesh.

Keywords: *Ocimum basilicum*, Crude salt, Traditional medicine, Traditional knowledge, Value addition