

Studies on Production Technologies for Mesta (*Hibiscus sabdariffa* L.) in Medium Black Soils of Northern Dry Zone of Karnataka

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ABSTRACT

Three field experiments were conducted at Regional Research Station, Bijapur, University of Agricultural Sciences, Dharwad with the objectives to find out optimum sowing time, plant population, nitrogen level and stage of harvest for higher yield and economic returns of mesta and identification of suitable crops and spatial arrangement for mesta based intercropping system during 1998-99 and 1999 - 2000. The experiment on effect of plant population and nitrogen on mesta consisted of four varieties (AS-73-CP-560, AMV-3, AMV-4 and Local), three plant population (0.22, 0.33 and 0.66 million plants ha⁻¹) and four nitrogen levels (0,30,60 and 90 kg N ha⁻¹). In the second experiment on effect of date of sowing, stage of harvest and plant population, there were four dates of sowing (I F.N. of July, II F.N. of July, I F.N. of August and II F.N. of August), two stages of harvest (at 50% flowering and at maturity) and three plant population (0.22, 0.33 and 0.66 million plants ha⁻¹). Both the experiments were laid out in split-split plot design with three replications. The experiment on intercropping of mesta with millets at varying row proportions consisted of three millet intercrops (pearl millet, foxtail millet and finger millet) and four row proportions (1:2, 1:3, 2:4 and 1:5) along with their sole crops. The experiment was laid out in randomized block design with three replications.

Fibre yield of mesta was significantly higher with AS-73-CP-560 (982 kg ha⁻¹) compared to AMV-3 and Local (798 and 588 kg ha⁻¹, respectively) but was on par with AMV-4. Similar trend was observed with respect to green matter and dry stalk yield ha⁻¹. AS-73-CP-560, AMV-3 and AMV-4 were on par with each other in their seed yield (646,612 and 636 kg ha⁻¹, respectively) but significantly superior over local (214 kg ha⁻¹). Planting of mesta at lower plant population (0.22 million ha⁻¹) with 60 kg N ha⁻¹ was found significantly superior in fibre and seed yields and in economic returns.

Fibre yield, seed yield, green matter and dry stalk yields of mesta were significantly higher with sowing during I.F.N. of July compared to later sowing dates. Harvesting the crop at maturity both for fibre and seed was more profitable compared to harvesting the crop at 50 per cent flowering.

Intercropping of mesta + pearl millet at 1:2 row proportion gave significantly higher fibre equivalent yield (1507 kg ha⁻¹) and net returns (Rs 5875 ha⁻¹) followed by 1:3 row proportion of the same intercropping system (1499 kg ha⁻¹ and Rs 5818 ha⁻¹, respectively). However, benefit cost ratio was higher with mesta + pearl millet intercropping at 1:3 row proportion (1.87), followed by 1:2 row proportion (1.85).

Allelopathic Effect of Teak and Casuarina on the Performance of Greengram (*Vigna radiata* L.)

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ABSTRACT

Field experiments were conducted during two crop seasons (1998-99 and 1999-2000 kharif) at farmers field to study the allelopathic effect of teak and casuarina on the performance of greengram. The treatments consisted of six distances viz., 0-3, 3-6, 6-9, 9-12, 12-15 and 15-18m (T₁ to T₆) at 3m intervals from the tree row upto 18m. In each interval, plot of 3m x 8m size were made. The T₇ to T₁₂ treatments consisted of cement rings (90 cm deep and 60 cm wide) inserted into the fields to a depth of 90 cm serially from T₁ to T₆ at 3rd, 6th, 9th, 12th, 15th and 18th m. Pot experiment was carried out after the field experiment to know the performance of various cereals, pulses and oilseeds to root and root + leaf leachates of casuarina, teak and eucalyptus.

Under field conditions, teak and casuarina trees reduced the greengram emergence, growth and yield parameters ultimately affecting the grain yield upto a distance of 12 m and 9 m respectively. The lowest grain yield was noticed at 3m (481 and 489 kg/ha at teak and casuarina site respectively) from tree row and the yield gradually ameliorated with increase in distance and tree effect got nullified after 12m and 9 m in teak and casuarina respectively. The yield levels with casuarina at 9-12 and 12-15 m were on par with that of 15-18 m (607 kg/ha) and 12-15 m greengram yield was on par with that of 15-18 m (604 kg/ha) in teak. The grain yield of greengram within the cement rings which did not significant amongst themselves and were on par with the yield recorded at 15-18m distance outside cement ring.

In pot experiment, pulses were more adversely affected than cereals and oilseeds. Root + leaf leachate was detrimental than root leachate. Eucalyptus tree leachate has more adverse effect followed by teak and then casuarina on various cereals, pulses and oilseed crops.

Screening Cotton Genotypes (*Gossypim* spp.) for Tolerance to Drought Using Line Source Sprinkler Irrigation Technique

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ABSTRACT

Totally 52 cotton genotypes were screened using line source sprinkler irrigation technique (LST) and pot experiment during 1999-2001. The results revealed that under severe moisture deficits (40-80%), *G. arboreum* recorded the highest yield followed by *G. herbaceum* and *G. hirsutum*. Four genotypes, CBR-8, LRA-5166, CPD-418 and TCH-1002 in *G. hirsutum*, three genotypes, DB-3-12, R-51 and H-10 in *G. herbaceum* and three genotypes, A- 82-1-1, AK-235 and PA-183 in *G. arboreum* were found to be drought tolerant based on biomass, MDI, WUE and yield. The correlation studies indicated that the yield showed significant positive relationship with biomass ($r = 0.90^{**}$), plant spread ($r = 0.85^{**}$) and number of reproductive parts ($r = 0.79^{**}$) at harvest. The rate of photosynthesis at 90 DAS had significant positive relationship ($r = 0.37^{**}$) over the mean of all moisture regimes.

The genotypes identified as drought tolerant or susceptible in LST behaved similarly under rainfed field trial. The seed cotton yield showed significant positive relationship with biomass ($r = 0.96^{**}$), number of bolls ($r = 0.60^{**}$) and harvest index ($r = 0.54^{**}$). Biophysical parameters like rate of photosynthesis, rate of conductance and relative water content (RWC) had significant positive relationship with seed cotton yield, while leaf temperature had nonsignificant negative relationship. The nitrate reductase activity had significant positive relationship with yield both at flowering and boll formation.

Similarly, the results of pot culture experiment indicated that LRA - 5166 (*G. hirsutum*), DB-3-12 (*G. herbaceum*) and AK-235 (*G. arboreum*) were found to be drought tolerant. These genotypes showed lesser reduction in plant height, plant spread, leaf area (LA), total dry matter production, total chlorophyll, RWC and increased free proline content during various periods and cycles of stress and further they showed faster recovery after alleviation.

Based on the above three experiments, the genotypes LRA - 5166 (*G. hirsutum*), DB-312 (*G. herbaceum*) and AK-235 (*G. arboreum*) were found to be drought tolerant. These genotypes possessed lower LA, moderate plant height, higher levels of RWC, leaf water potential (LWP), free proline content, TDM, chlorophyll content and total sugars. Hence, these indices may be used either to screen or to develop drought tolerant cotton genotypes.

Hirsutisation of *Gossypium arboreum* L. Cotton and Genetic Emendation of *G. hirsutum* L. for Sucking Pest Resistance Through Introgression

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ABSTRACT

Investigations were undertaken to study genetic and economic worth of introgression of genes between *G. arboreum* x *G. hirsutum* by evaluating segregating generations and stabilized introgressed lines in multilocations representing three cotton growing zones of India. Derivatives from such crosses along with species representing different genomes of *Gossypium* were also studied to unearth anatomical basis of piercing and sucking pest resistance. Inter specific cross derivatives with more than 3.0g of boll weight and more than 35 per cent four loculed bolls were present in BC₁F₇ progenies. For the first time *G. arboreum* genotypes stable across environments, with higher seed index (>8.0g), fibre length (>28.0mm) and lower fibre micronaire around 4.0 were isolated, which were due to introgression of genes from *G. hirsutum* to *G. arboreum*. The data from early backcross generations revealed transgressive segregation for most of the economical traits like symposia, boll weight, seed index, lint index, seed cotton yield, ginning out turn (GOT), fibre strength and micronaire. Altered correlations among characters especially GOT and seed index and other fibre properties were due to new recombination of genes between A and AD genomes. Creation of genetic variability was evident as introgressed lines formed one big cluster separate from parents and checks with few genotypes being solitary. The data suggested presence of genes for higher seed index, longer and smooth fibre in D genome but not in A genome. High yielding cross derivatives with *G. hirsutum* quality fibre proved Hirsutisation of *G. arboreum* cotton. Genomic differences for leaf anatomy and morphological features were evident where in *G. australe*, *G. herbaceum*, *G. arboreum*, *G. anomalum* species exhibited isobilateral types of leaf with palisade parenchyma present both in abaxial and abaxial surface of leaf lamina. Studies with light and scanning electronic microscopy indicated transfer of lower palisade cells from *G. arboreum* to *G. hirsutum*. Further data also revealed involvement of D genome in absence of lower plisade in AD tetraploid. Path analysis depicted direct effects of cortex cell density, lower palisade cell length and number to jassid resistance.

Genetic Analysis and Molecular Mapping of Components of Resistance to Shoot Fly (*Atherigona soccata* Rond.) in Sorghum (*Sorghum bicolor* (L) Moench)

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ABSTRACT

Present investigation was initiated to study the genetic architecture of host plant resistance to shoot fly and its component traits, and to identify markers linked to QTLs controlling these traits in relation to varying levels of shoot fly infestation in sorghum. Mapping population consisting of 252 RILs of cross between BT x623 (susceptible) and IS 8551 (resistant) was subjected to phenotypic evaluation under artificial infestation in three environments. A subset of this mapping population (93 RILs) was used for genome mapping with SSR markers. The two parents differed for phenotypic characters. Variances due to genotypes and G x E interaction were significant for the traits studied. Highly significant and negative correlation coefficients were observed between the shoot fly resistance traits (violet position % and deadhearts%) and the component traits, such as, glossiness, trichome density and seedling vigour.

Continuous distribution of RILs suggested quantitative nature of the traits studied. The resistance traits recorded moderately high degree of variability and heritability. Glossiness and trichome density recorded consistently high degree of variability, heritability and Spearman's rank correlation coefficients, in individual and across the environments. Genetic analysis revealed their control by major loci. Predicted correlated genetic gain was high for shoot fly resistance when glossiness, trichome density and seedling vigour were used as indirect selection criteria. Transgressive segregants with phenotypic values outside the parental limits were observed for most of the traits, except for high intensity of glossiness and low deadhearts.

Parental polymorphism with 96 SSR primer pairs showed 80% of these to be polymorphic and 49% detected gel-scorable polymorphism. A genetic linkage map was constructed in which 23 markers were assigned to linkage groups (LGs) A, B, C, and J. QTL analysis for single environment identified eight QTLs. One major QTL for glossiness (tpx94-Xtx65) was detected on LGJ, with high phenotypic variance explained ranging from 34.3 to 46.5% in individual and across the three screening environments. Minor QTLs for seedling vigour (three), seedling height (four) and grain yield (one) were also identified. Further the QTL identified for glossiness on LGJ co-mapped with region associated with deadhearts (%) under high shoot fly pressure. The present study has assumed the feasibility of identifying QTLs for shoot fly resistance and pave the way for the use of marker assisted selection in breeding for shoot fly resistance.

Studies on seed production and post harvest Techniques in Chilli
(*Capsicum annuum* L.)

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ABSTRACT

Field and laboratory experiments were conducted to study the influence of provenance, stages of pickings, storage containers and seed treatment with chemicals and bio-products on two chilli varieties viz., Byadagikaddi and Dyavanur local at Main Research Station, Dharwad and Agricultural Research Station, Hanumanamatti and Annigeri during 1997 to 2000D.

Byadagikaddi variety recorded significantly higher growth and yield parameters compared to dyavanur local. Byadagikaddi variety produced higher fruit length (15.86 cm), fruits per plant (109.50), higher fruit yield per plant (81 .57g) and per ha (131 8 kg) and seed yield (498.42 kg/ha) and also recorded higher root length (9.81 cm) shoot length (9.03 cm) and vigour index (1694) compared to dyavanur local. Dharwad location recorded higher number of fruits per plant (109.63), fruit weight (1 .33 g), fruit yield per plant (86.33 g) and per ha (1468 kg) and seed yield (51 2.42 kg/ha) over Hanumanamatti and Annigeri location and seed quality parameters also showed similar trend. Second and first picking recorded higher fruit length (13.70 and 1 2.52 cm) and fruits per plant (28.94 and 35.63), fruit yield (428.56 and 380.40 kg/ha), seed yield (159.61 and 140.85 kg/ha) and also higher seed quality parameters viz., Germination (88.44 - 80.06), field emergence (83.04 - 80.69), vigour index (1311 - 1146) and lower in electrical conductivity (1.47 - 1.56 dSm⁻¹) of seed leachate over third and fourth picking.

Byadagikaddi variety dried at 35⁰c recorded higher seed quality parameters. Chilli fruits dried in mechanical dryer at 35⁰c recorded higher germination (90.37%), root length (8.76 cm), shootlength (7.85 cm), vigour index (1494) and lower electrical conductivity (1 .26 dsm⁻¹) indicating better seed quality over other drying methods.

Byadagikaddi showed significantly higher seed quality parameters during storage period. The seeds stored in aluminium foil recorded significantly higher germination (89.67-@82.83%), field emergence (84.0-76.7%), root length (9.77-6.85 cm), shootlength (8.55-6.38 cm), vigour index (1643-1076) and lower electical conductivity (0.808-1.57 dSm⁻¹) at the end of 20 months of storage period followed by polythene bag (700 gauge) and stored in fruit form.

The seeds treated with potassium iodide (10⁻³ m), calcium oxychloride (4 g/ kg)) and pongamia leaf powder (40 g/kg) recorded significantly higher seed quality parameters and maintained the seed germination above minimum seed certification standard (60%) over a period of 20 months.

Evaluation of Insect Pest Management Components in Soybean Ecosystem

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ABSTRACT

The studies were conducted on survey and surveillance of pests associated with soybean, seasonal incidence, nature of damage, influence of cultural practices on the incidence of insect pests and evaluation of ecofriendly methods for effective management of key sets in soybean ecosystem at Main Research Station, University of Agricultural Sciences, Dharwad during 1997 to 1999.

Soybean was attacked by 48 phytophagous species, of which 5 belonged to orthoptera, 13 to Hemiptera, 1 to *Thysanoptera*, 18 to Lepidoptera, 9 to Coleoptera, 2 to Diptera and three were non insect pests. The seedling borers, *Melanagromyza sojae* zehnter, *obereopsis brevis* Swed leaf eating caterpillar *Spodoptera litura* Fab. and pod borer *cydia ptychra* Meyrick were key pests during kharif. Whereas, leafminer *Aproaerema modicella* Deventer, whitefly *Bemisia tabaci* Genn. and leaf hopper. *Amrsca biguttula* Ishida were major during summer.

Pod borer incidence was maximum in July sown crop. The per cent incidence of stemfly was low (17.66%) on soybean sown in second week of June whereas it was high (21.70%) with girdle beetle. Lower plant population of 0.28 million plants per ha recorded lower infestation of the seedling borers. The per cent pod bore damage was low (21.43%) on early sown crop during June.

Pathogenicity of *Nomuraea rileyi* indicated 88.25 and 8.25 per cent mortality of *Spodoptera litura* and *Cydia ptychora* after 10 days of spray, respectively. The mycopathogen occurred in epizootic form on *S.litura* in soybean between 31 and 38th with peak activity in 34th and 35th standard week. *N. rileyi* @ 2.4×10^8 conidia/1 was most effective in reducing the larval population.

Among botanicals NSKE (5%). *Vitex Negundo* (5%) and combination of NSKE +SINPV proved effective in reducing the larval population and recording higher seed yield with better B:C ratios. Seed treatment with thiamethoxam and imidacloprid resulted in lower incidence of seedling borers and higher yield of soybean. Lambdacyhalothrin and chlorpyrifos established superiority in lowering larval population, pod damage and higher seed yield.

Management of Wilt and Root Rots of Cotton with Special Reference to Bio Fungicides

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ABSTRACT

Survey was revealed that wilt caused *Fusarium solani* up to 20 per cent followed by *Rhizoctonia solani* and *Rhizoctonia solani* and *Rhizoctonia bataticola* up to six per cent and *Sclerotium rolfsii* was negligible. Among nine isolates of *F. solani*, the Raichur isolate was more virulent. Among twelve cultures of *Trichoderma* and two cultures of *Gliocladium virens* against all four pathogens. *T. harzianum* of Dharwad isolate was the best and *G. virens* of TNAU was the best. In growth period studies, *T. harzianum* reached its peak on 12th day and maltose and dextrose were best to support the growth. Transparent polythene bag was superior. Among substrates wheat bran was superior. In seed treatments, @ 8g/kg of seed and among soil applications, three percent was superior. In the combination, seed treatments @ 8g/ kg with 1% soil application was superior.

Among agro chemicals tested for both *T. harzianum* and pathogens, the fungicides, carbendazim and benomyl were inhibitory to *T. harzianum*. Benomyl and carbendazim were excellent to control *F. solani*. Similarly, benomyl, methoxy ethyl mercury chloride (MEMC), carboxin, thiram and MEMC were superior to control *R. solani* and *R. bataticola* respectively. For *S. rolfsii*, carboxin was the best. Among insecticides, chlorpyrifos was inhibitory to *T. harzianum*, followed by imidachloprid. Endosulfan was least inhibitory. Carbofuran, phorate and endosulfan were less effective to pathogens. Among herbicides, alachlor was more deleterious than paraquat. Diuron was effective against all four pathogens. Among organic amendments neem cake was superior in suppressing the growth of all four pathogens. In storage studies, increase in temperature lowered cffu and at 0°C it was maximum and wheat bran was the best and can be stored up to five months. Culture filtrates of all twelve *Trichoderma* and two *G. virens* on seed germination of ayadhar and Abhadita with delinted and fuzzed seeds revealed that delinted seeds had better germination and culture filtrates enhanced seed germination.

Standardization of Production Technology in Snapdragon (*Antirrhinum majus* L)

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ABSTRACT

Snapdragon (*Antirrhinum majus* L.) is one of the important commercial cut flower grown across the globe. In order to standardize the production technology for profitable cultivation as cut flower, experiments were conducted at University of Agricultural Science, Dharwad during 1999-2001. Fifteen genotype were evaluated over two seasons under transitional tract of northern Karnataka for growth and floral characters.

Among the genotypes a wide and highly significant variation was observed for most of the character. The characters. The genotypes I.G.Mix showed superior performance for growth and yield attributes. High phenotypic and genotypic coefficients of variability were observed for the characters viz., durability of spike on plant, number of spikes per plant and spike length indicating the reliability of selection. In general, heritability (broad sense) estimates were high for most of the characters. High heritability with high genetic advance over mean was found for number of spikes per plant, number of spikes per plant, number of florets per spike, spike length and durability of spike on plant indicating the scope for genetic improvement through selection. Number of spikes per plant had a positive correlation with number of leaves per plant, leaf area per plant, leaf area per plant, days to bud initiation and days to first flowering at both phenotypic and genotypic levels indicating the possibility of simultaneous selection for these characters. Spike length was directly influenced by durability of spike on plant and florum length. Considering various, economic characters, genotypes I.G. Mix, Rocket White and Rocket Bronze performed well under transitional tract of northern Karnataka.

A wider planting geometry of 30x40 cm along with 100 kg nitrogen application per hectare recorded maximum number of quality standard spikes per plant besides other growth and yield attributes under both rabi and kharif seasons. During kharif, planting at a spacing of 30 x30 cm along with the application of 100 kg N per hectre was found best to achieve higher economic yield.

Among the different chemical preservatives tried, to know their effects on the post-harvest physiology of snap dragon cut flowers either cobalt sulphate @ 200 ppm or silver nitrate @50 ppm along with two per cent sucrose are best to promote these life and quality of snapdragon cut flowers.

Behavioural Problems Among School-Age Children: Prevalence and Intervention

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ABSTRACT

The study on Behavioural Problems Among, School -age Children: Prevalence and Intervention carried out in Dharwad urban area during the year 2000-2002 revealed that the prevalence was ranged from 12.31-17.64 per cent. Higher percent of children (50-80%) had externalizing problems compared to internalizing problems. Higher percentage of boys among all schools had externalizing problems compared to girls. Boys from Government and Aided schools had high level of externalizing problems hyper kinetic, conduct, hostile/aggression). Higher percentage of girls than boys from Government Aided and Private schools had high level of internalizing problems (withdrawn/solitary, anxiety/depression). Higher percentage of boys had learning problems and boys and girls were equally on high level. Older children had significantly more of impulsive problems compared to younger children. Children from nuclear families had higher levels of psychosocial problems and were significantly higher had extlernalizing problems. Combined effect of psychosocial, demographic and socio -economic factor brought about a significant variation of 33 per cent in externalizing problems and 32 per cent in internalizing problems. Mother's education was the only factor, which significantly reduced the learning problems among children. Intervention to children had significant impact in reducing the externalizing problems such as inattention, hyperactivity, total hyperkinetic problems, conduct problems, hostile/aggression, enhancing attention span, perceptual ability, concentration and in improving cooperation, assertion, self control social skills and in reducing learning problems and scholastic backwardness among children. Intervention to parents had significant impact in reducing psychosocial problems prevailing in the low SES families. About 25per cent of the primary schools were randomly selected from three strata. i.e. Government, Aided and Private schools. Children with behavioral problems were identified using the developed rating scale. Two schools were selected to study psychosocial factors and socio demographic factors influencing the behavioral problems (N=87). A total sample of 56 children who exhibited a high level of externalizing behavioral problems were randomly assorted in to two groups (experimental (28) and control (28) and by matching on age, gender, grade, socioeconomic status. The intervension program was provided for children about six months. For their parents/ 1 guardian, knowledge was imparted with the help of developed intervention package and through series of guest lectures from experts in the field of psychology, homeopathy and child development.

Performance, Constraints and Problems of Elected Women Representatives of Gram Panchyat in Dharwad Taluk with Special Reference to Family

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ABSTRACT

All the Elected Women Representatives (EWRs) of Gram Panchyat (GP) of Dharwad taluk who completed one full tenure from 1994 to 2000 barring those who have died and migrated formed the sample of 153. Ten were selected as sub sample for case studies; personal interviews observation and case study were the methods used. Results revealed that majority belong to SC/ST castes and to families living below the poverty line. Majority were in the age group of 45 to 60 years, illiterate and worked as agricultural laborers with no land holding or marginal land holding. Majority were married, had grown up children and belonged to large sized families. Majority had no political background but had the support of one of the other political party in fighting election. Two thirds received financial support from the party. Majority had contested first time from the reserved constituency and elected through ballot.

Twenty four percent used mass media as a source of information regarding GP. Majority had the knowledge regarding their tenure conducting regular meetings and tax collection. But most of them lacked knowledge regarding special and emergence meetings, quorum for conducting meetings, cancellation of membership no confidence motion, developmental schemes, financial matters, annual reports and budget. 86% attended the panchyat meeting regularly, 3/4th participated in discussions. 90% complained that they faced both direct and indirect opposition to their participation in discussions from the male members. 55% did not participate in the standing committee. Majority had no knowledge regarding the purpose and functions of the standing committee 89% did not participate in efforts to solve the community issues.

Less than 50% attended three training programmes and many felt that training programmes increased their knowledge. Loss of daily wages was the main reason for not attending training programmes. Some of the respondents carried out activities mainly in the areas of health, family planning, education and welfare. Only 16% took up pro-active step like formation of self-help groups. Effort to solve alcoholism formation of DWACRA Group and Mahila Mandal. Fifty seven percent attended all Gram Sabhas. 85% had no knowledge regarding purpose of functions of Gram Sabha. More than 1/3rd complained about the absence of officials from different departments in Gram Sabhas. Majority stated that their family members were very supportive of their panchayat work. Nearly 3/4th stated that their household work was mainly shared by their daughter-in-law. Among social-cultural and economic constraints 44% faced constraints because of gender. At personal level, for 74% of respondents illiteracy was the major constraint. At GP level, lack of information flow from secretary was the main constraint.

A negative and significant correlation at 5% level was found between total family problems and total performance of EWRs. The family problems and performance of EWRs

in the area of agriculture and animal husbandry was found to be negatively and significantly correlated at 5% level. The family problems of residents and members were found to be negatively and significantly correlated with the performance in the area of health, family planning, education and welfare at 1% and 5% respectively. The other problems related to GP, problems related to socio-cultural, personal and class factor were found to be negatively and non-significantly correlated. Thus this study clearly reveals the importance of family problems which negatively effectively affect the EWRs. Work.

Effect of Plant Geometry and Fertilizer Levels on Growth, Yield and Quality of Chilli (Cv. Vietnam-2)

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ABSTRACT

A field experiment was conducted to study the effect of plant geometry and fertilizer levels on growth, yield and quality of chilli (Cv.Vietnam-2) at Main Research Station, Dharwad during kharif, 2001. The experiment was laid out in randomised block design with 16 treatment combinations consisting four spacing and four fertilizer levels.

A spacing of 60 cm x 45 cm recorded significantly higher number of fruits and fruit weight sq m^{-1} and dry chilli yield ($1\ 223.8\ \text{kg ha}^{-1}$) compared to other spacings. However, the total dry matter production, number of fruits and fruit weight plant⁻¹ were maximum with 90 cm x 60 cm spacing.

Application of 150:75:75 kg N, P_2O_5 and $\text{K}_2\text{O ha}^{-1}$ produced significantly higher fruit yield ($1\ 1\ 76.0\ \text{kg ha}^{-1}$) over other fertilizer levels and was on par with 125:62.5:62.5 kg N, P_2O_5 and $\text{K}_2\text{O ha}^{-1}$ ($1\ 095.3\ \text{kg ha}^{-1}$). Application of 150:75:75 kg N, P_2O_5 and $\text{K}_2\text{O ha}^{-1}$ also resulted in significantly higher total dry matter plant⁻¹ per cent fruit set, number of fruits plant⁻¹, fruit weight plant⁻¹ and nutrient uptake over other fertilizer levels.

Quality parameters differed significantly with spacing and fertilizer levels. A spacing of 90 cm x 60 cm recorded significantly higher ascorbic acid ($1\ 72.1\ 5\ \text{mg } 100\ \text{g}^{-1}$) over other spacings. Oleoresin content of chilli fruit was not significantly influenced by spacing. Whereas, significantly higher oleoresin yield ($1\ 7.97\ \text{kg ha}^{-1}$) was recorded with 60 cm x 45 cm over other spacings. Application of 1 50:75:75 kg N, P_2O_5 and $\text{K}_2\text{O ha}^{-1}$ recorded significantly higher ascorbic acid ($171.45\ \text{mg } 100\ \text{g}^{-1}$), per cent oleoresin (15.67) and oleoresin yield ($1\ 8.41\ \text{kg ha}^{-1}$) over other fertility levels.

Application of 1 50:75:75 kg N, P_2O_5 and $\text{K}_2\text{O ha}^{-1}$ with 60 cm x 45 cm spacing recorded significantly higher net returns (Rs. 38,759 ha^{-1}) and B:C ratio (2.56) over other treatment combinations except 60 cm x 45 cm spacing and 125:62.5:62.5 kg N, P_2O_5 and $\text{K}_2\text{O ha}^{-1}$ with which it was on par.

Response of French bean (*Phaseolus vulgaris* L.) to Fertilizer levels in Northern Transitional Zone of Karnataka

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ABSTRACT

A field experiment was conducted during kharif 2001, to study the response of French bean (*Phaseolus vulgaris* L.) to fertilizer levels at Main Agricultural Research Station, University of Agricultural Sciences, Dharwad, Karnataka. The experimental site consisted of black soils clay loam soil in reaction (pH 7.6), low in available N (220 kg ha⁻¹), medium in available P₂O₅ (32.2 kg ha⁻¹) and high in available K₂O (328.6 kg ha⁻¹). Three levels each of nitrogen (40, 80 and 120 kg ha⁻¹) and phosphorus (25, 50 and 75 kg ha⁻¹ P₂O₅) and two levels of potassium (30 and 60 kg ha⁻¹ K₂O) in addition to an unfertilized control (0:0:0 kg ha⁻¹ NPK) were tried in a RCBD using three replications. Performance of crop with medium N and higher P₂O₅ levels was superior to others. The combination of 80:75:30 kg ha⁻¹ N, P₂O₅ and K₂O respectively produced significantly higher grain yield (2076 kg ha⁻¹) over rest of the treatments due to significant improvement in growth and yield components viz., leaf area index (2.68), total dry matter (16.87g plant⁻¹), number of pods plant⁻¹ (12.38), number of grains pod⁻¹ (5.26) and grain weight plant⁻¹ (8.93 g). All the fertilized treatments recorded significantly higher grain yield over unfertilized control (1306 kg ha⁻¹).

Total N uptake was significantly higher (76.20 kg ha⁻¹) with medium rate of, N fertilization (80 kg ha⁻¹). Whereas, total phosphorus and potassium uptakes, were significantly higher (36.00 kg P₂O₅ and 34.81 kg K₂O ha⁻¹) with high rates of phosphorus (75 kg ha⁻¹) and potassium (60 kg ha⁻¹) fertilization.

Apart from grain and protein yields, higher net returns (Rs.25613/-) and B:C ratio (2.61) were obtained with 80:75:30 kg ha⁻¹ N, P₂O₅ and K₂O

Effect of Fertigation on Yield, Quality and Nutrient uptake of Sugarcane

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ABSTRACT

A field experiment was conducted to study the effect of fertigation on yield, quality and nutrient uptake of sugarcane (CoC-671) in medium black soil during 2001-02, at Agricultural Research Station, Arabhavi, Gokak taluk of Belgaum district. The experiment consisted of eight treatments with three replications and was laid out in RBD.

The cane (141.43 t/ha) and sugar (20.65 t/ha) yields were increased by 24.34 and 34.53 per cent due to fertigation when compared to soil application of fertilizer with surface irrigation (106.48 t/ha). Further, the cane and sugar yields were increased with an increase in fertilizer level and were maximum with 125 per cent level of fertigation.

Fertigation of 75 per cent of recommended levels of N and K recorded on par yield with that of 100 per cent N and K indicating a saving of fertilizer to the tune of 25 per cent. Similar trend was observed with respect to growth and yield attributes. The juice quality parameters such as brix, pol per cent and CCS per cent did not differ significantly due to fertigation treatments.

The total quantity of water applied through drip was 107.5 cm as compared to 201.0 cm in surface irrigation resulting in 46.52 per cent water saving. The water use efficiency ranged between 1.24 to 1.34 tonnes per hectare cm in fertigation treatments as compared to 0.53 tonnes per hectare cm in surface method. Fertigation resulted in significantly higher uptake of nutrients than soil application of fertilizers with surface irrigation.

Further, the uptake of nutrients was increased with an increase in fertilizer level and was maximum with 125 per cent level of fertigation. Fertigation of 100 per cent recommended levels of N and K resulted higher net returns of Rs. 41,785/-. This was 33.47 per cent higher compared to soil application of fertilizers with surface irrigation (Rs. 27,800/-). Fertigation of 75 and 100 per cent N and K both recorded higher B:C ratio of 1.59.

Integrated Nitrogen Management in Drill Sown Upland Rice through Leaf Colour Chart (Lcc)

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ABSTRACT

A field experiment was conducted at the Agricultural Research Station, Mugad, during kharif season of 2001 to study the effect of integrated nitrogen management in drill sown upland rice through leaf colour chart.

Treatments included two varieties Amrut and Dodiga as first factor and two organic nutrient sources viz., FYM @ 10 t ha⁻¹ vermicornpost @ 2.5 t ha⁻¹ and no organic control as second factor and two nitrogen management practices viz., that at LCC threshold value of 3 and recommended practice as the third factor. Farmers' practice with the application of FYM @ 10 t ha⁻¹, N and P₂O₅ @ 80 kg and 57.5 kg ha⁻¹ respectively was included as check treatment for comparison. The factorial experiment was laid out in RBD with single control.

The results showed that Dodiga recorded higher grain yield than Amrut. N management at LCC-3 recorded similar grain yield to that of RDN, but the N required was lower in the former. Chemical fertilizers could be saved to an extent of 10-30 per cent with the incorporation of organics with N management at LCC-3, without significant reduction in grain yield.

Higher N uptake was recorded with vermicompost application with N management at LCC-3 in Dodiga variety than other treatment combinations and check. Vermi Compost application with N-management at LCC-3 in Dodiga gave higher net returns (Rs. 19,190) and B: C ratio (1.73).

Utility of *Parthenium* as a Source Green Manure in Transplanted Rice (*Oryza sativa* L.)

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ABSTRACT

A field experiment was conducted during summer season of 2002 at ARS, Siruguppa to study the "Utility of *parthenium* as a source of green manure in transplanted rice". There were 18 treatment combinations, comprising of six organic manures in main plots and three fertilizer levels in sub-plots and replicated three times in split-plot design. Organic manures exerted significant influence on growth and yield of rice. Incorporation of green *parthenium* @ 2.5 t ha⁻¹ and FYM @ 6 t ha⁻¹ recorded significantly higher grain yield (45.07 q ha⁻¹), straw yield (61.09 q ha⁻¹), number of panicles per hill (12.13), number of grains per panicle (127.11), length of panicle (19.74 cm) and harvest index (42.30 %) when compared to other organic manures and control.

Application of 100 per cent RDF recorded significantly highest grain (45.68 q ha⁻¹) and straw yield (63.46 q ha⁻¹) when compared to 75 and 50 per cent RDF. Combined application of *parthenium* @ 2.5 t ha⁻¹ + FYM @ 6 t ha⁻¹ and 100 per cent RDF registered significantly higher grain yield of 51.00 q ha⁻¹ over rest of the treatment combinations and it was on par with the same treatment combination along with 75 per cent RDF (48.00 q ha⁻¹).

Application of organic manures influenced all soil properties except pH and EC. Organic carbon content (0.75%), uptake of N (121.10 kg ha⁻¹), P₂O₅ (29-55 kg ha⁻¹), K₂O (139.34 kg ha⁻¹), total bacteria (10.33 x 10⁴/g of soil), PSB (9.33 X 10⁴/g of soil), ANUE (21.53 %) and PNUE (3714 %) were significantly higher due to incorporation of *parthenium* @ 2.5 t ha⁻¹ + FYM @ 6 t ha⁻¹ over other organic sources. Similarly, all these properties were significantly higher under the application of 100 per cent RDF compared to other lower levels.

The maximum gross returns (Rs. 29,926 ha⁻¹) and net returns (Rs. 16,440 ha⁻¹) were recorded with the incorporation of *parthenium* @ 2.5 t ha⁻¹ + FYM @ 6 t ha⁻¹. Incorporation of *parthenium* @ 5 t ha⁻¹ recorded significantly higher B: C ratio (2.30). Application of *parthenium* @ 2.5 t ha⁻¹ + vermicornpost @ 1 t ha⁻¹ recorded maximum cost of Cultivation (Rs. 14,234 ha⁻¹).

Effect of Irrigation Scheduling on the Performance of Wheat Genotypes in Vertisols

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ABSTRACT

A field experiment was conducted at the Agriculture College Farm, Dharwad during rabi season of 2001-2002 to study the effect of irrigation scheduling on the performance of wheat genotypes in vertisols.

Results indicated that the grain yield and straw yield were significantly highest (2669 kg ha⁻¹ and 4599 kg ha⁻¹ respectively) in I₇ irrigation schedule which received six irrigations at crown root initiation (CRI) + tillering + jointing + flowering + milky + dough stages. Growth and yield parameters (effective tillers, total dry matter, leaf area, leaf area index, number of grains, 1000 grain weight) were also significantly highest in I₇ irrigation schedule over I₁, I₂, I₃, I₄, I₅ and I₆ irrigation schedules.

Consumptive use of water was highest (485.5 mm) in I₇ irrigation schedule which received frequent irrigations. Water use efficiency (WUE) was highest (9.19 kg ha⁻¹ mm⁻¹) in I₂ irrigation schedule where three irrigations were given at CRI and flowering stages. The higher soil moisture was extracted from the surface layer (0-15 cm) in frequently irrigated (I₇) treatment and extraction from this layer decreased progressively in less frequent irrigation schedules (I₁). In general, the crop extracted higher soil moisture from surface layer and extraction decreased with increasing depths.

Economic analysis showed that frequent irrigation schedule (I₇) resulted in higher net returns (Rs. 17,487) and B:C ratio (2.22).

Thus, irrigating the wheat crop at all critical stages produced higher grain yield and net returns. Under scarcity of irrigation water, four irrigations scheduled at crown root initiation (CRI), tillering, flowering and milky stages recorded on par grain yield resulting in saving of two irrigations. Wheat genotype DWR- 1006 performed better than DWR- 162.

Effect of Row Spacing and Fertilizer Levels on Growth and Yield of Groundnut Genotypes

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ABSTRACT

A field experiment was conducted during rainy season of 2000-01 at Main Research Station, University of Agricultural Sciences, Dharwad, to investigate the effect of row spacing and fertilizer levels on growth and yield of groundnut genotypes. This experiment was laid out in a split-plot design with three replications. Treatments consisted of three groundnut genotypes viz., GPBD-4, TGLPS-3 and JL-24 as main plots and four levels of spacing and fertilizers viz., S₁F- 30 x 10 cm + 100% RDF (25:75 : 25 Kg N, P₂O₅ K₂O/ha), S₁F₂ -30 x 10 cm + 150% RDF (37.5 : 112.5:37.5 N₁P₂O₅ K₂O/ha), S₂ F₁-45 x 10 cm + 100% RDF and S₂F₂ -45 x 10 cm + 150% RDF) as sub-plot treatments.

The results showed that, groundnut genotypes differed significantly. Genotype GPBD-4 recorded significantly higher dry pod, kernel and oil yield (2892.58, 2256.33 and 1093.87 kg/ha, respectively) as compared to TGLPS-3 (2685.30, 1822.33 and 865.07 kg/ha respectively) and JL-24 (2475.50, 1829.33 and 862.34, kg/ha, respectively). There was significant difference in any pod, kernel and oil yield due to row spacing, Closer row spacing of 30 x 10 cm recorded higher dry pod yield (2754.55 kg/ha), kernel yield (1 980.50 kg/ha) and oil yield (943.74 kg/ha) as compared to wider row spacing of 45 X 10 cm (2614.39, 1957.80 and 937.11 kg/ha,. Respectively). Increasing the levels of NPK from 100 to 150 per cent of recommended does resulted in numerical in dry pod, kernel and oil yield. Growth and yield characters followed the similar trend.

The interaction effects were significant due to genotypes, spacing and levels of NPK. Genotype GPBD-4 recorded higher dry pod yield (3223.00 kg/ha), kernel yield (2580.00 kg/ha) and oil yield (1238.67 kg/ha) at wider row spacing of 45 x 10 cm with lower levels of NPK (25:75:25 kg N, P₂O₅ and K₂O/ha). The genotype GPBD-4 recorded significantly higher net returns (Rs. 27380/ ha) and B:C ratio (3.29) as compared to TGLPS-3 (Rs.16977/ha and 2.09, respectively) and JL-24 (Rs.13807/ha and 1.96, respectively) at wider row spacing of 45 x 10 cm with lower levels of NPK (25: 75: 25 kg N,P₂O₅ and K₂O ha) application.

Effect of Plant density on Growth and Yield of Groundnut Cultivars under Rainfed condition

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ABSTRACT

Field experiment to study the Effect of plant density on growth and yield of groundnut cultivars under rainfed condition was conducted at Main Research Station, University of Agricultural Sciences, Dharwad on medium black clayey soil (pH-7.9, organic carbon-0.72%, AvailableN-308 kg ha⁻¹ Available P₂O₅-45.80 kg ha⁻¹ and Available (K₂O-40 kg ha⁻¹) during kharif 2001.

In the present investigation, three groundnut cultivars: GPBD 4. TAG 24 and JL 24 were tried at three plant densities (3,33,333, 2,22,222 and 1,66,666 plants ha⁻¹). Two planting geometries (30 cm x 10 and 45 cm x 10 cm) were tried at a plant density of 2,22,222 plants ha⁻¹. The experiment was laid out in Split Plot Design with three replication. Since the crop undergone severe moisture stress during its growth period (Between 45 and 70 days after sowing), one protective irrigation was given uniformly to a depth of 5 cm.

Cultivar TAG 24 produced significantly higher dry pod yield and kernel yield (4908 and 3429 kg ha⁻¹, respectively) as compared to cv. GPBD 4 (4753 and 3347 kg ha⁻¹) respectively) and cv JL 24 (4334 and 3016 kg ha⁻¹, respectively). The yield components such as total number of developed pods plant⁻¹ dry pod weight plant⁻¹ shelling percentage, percentage of sound mature kernels and harvest index were greater in cv. TAG 24. Cultivar TAG 24 produced high total dry matter plant⁻¹ as compared GPBD 4 and JL 24. Further, cv.TAG 24 accumulated greater dry matter in reproductive parts (56.60%) as compared to cv. JL 24 (53.03%) and cv. GPBD4 (55.69%).

Dry pod yield of groundnut increased from 45127 to 5048 kg ha⁻¹ and kernel yield from 3256 to 3495 kg ha⁻¹ with increase in plant density from 1,66,666 to 3,33,333 plants ha⁻¹, respectively. The performance of individual plants with respect to morphological parameters except plant height growth and yield parameters were superior at lower plant density (66,666 plant ha⁻¹) as compared to performance at higher plant density (3,33,333 plant ha⁻¹).

Dry pod, kernel and, oil yield of cv. TAG 24 were significantly higher (5509, 3861 and 1857 kg ha⁻¹ respectively) at a plant density of 3,33,333 plants ha⁻¹ with a planting geometry of 30 cm x 10 cm. While, cv.GPBD 4 maximized its dry pod, kernel and oil yields (5191, 3716 and 1799 kg ha⁻¹, respectively) at a plant density of 2,22,222 plant ha⁻¹ with a planting geometry of 30 cm x 15 cm. However, cv. JL 24 recorded higher dry pod yield (4489 kg ha⁻¹) at 2,22,22 plants ha⁻¹ with a planting geometry of 45 cm x 10 cm; and higher kernel and oil yield (3185 and 1532 kg ha⁻¹, respectively) at 1,66,666 plants ha⁻¹ with planting geometry of 30 cm x 20 cm.

Physiological Investigation on Soybean (*Glycine max* (L.) Merrill) in a Agro forestry System

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ABSTRACT

A field experiment was conducted during kharif 2001-02 at Main Research Station, University of Agricultural Sciences, Dharwad, to study the influence of the tree species on soybean in a factorial randomized block design with three replications. There were fourteen treatment combinations consisting of *Mangifera indica*, *prosopis cineratia*, *Dalbergia latifolia*, *Ceiba pentandra*, *Azadirachta indica* and *Tamarindus indica*. as one factor and distance from the tree base (2m and 5 m) as another factor.

The dry matter in leaf , stem, pod and total in soybean was highest under *Prosopis cineraria* at 5m distance from tree base whereas, lowest was recorded under *Ceiba pentandra* at 2 m distance from tree base.

The growth parameters of soybean viz., LA, LAI, LAD, AGR, CGR, RGR, NAR, SLA and SLW differed significantly due to the effect of tree species. The parameters, AGR, CGR and NAR were maximum under *Prosopis cineratia* as compared to other tree species.

The grain yield of soybean was higher (2768 kg/ha) in the absence of tree species. Among the tree species, *Ceiba pentadra* affected the yield more than the other tree species at 2 m distance. Whereas, the effect of *Prosopis cineratia* was least in reducing the yield at 5 m distance.

Among the biochemical parameters the chlorophyll 'a' 'b' and total chlorophyll content in soybean leaf was highest at 2 m distance as compared to 5 m distance from base of tree. Maximum amount of total chlorophyll was noticed under *Ceiba pentandra*.

Effect of plant Growth Regulators, Chemicals and Nutrients on Morpho-physiological, Biochemical and Yield attributes in Mothbean (*Vigna aconitifolia* (Jacq.) marechal)

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ABSTRACT

A field experiment was conducted during khariff, 2001 at Main Research Station, University of Agricultural Sciences, Dharwad to study the effect of different growth regulators, chemicals and nutrients on morpho-physiological, biochemical and yield and yield attributes in mothbean. The experiment was laid out in randomized block design with treatments comprising three growth regulators (NAA, cycocel and miraculan);, two chemicals (salicylic acid and O-naphthol) and three nutrients FeSO_4 , ZnSO_4 and KNO_3 with three replications.

Application of NAA (20 and 40 ppm) and miraculan (2000 ppm) significantly increased the plant height while, cycocel 1,500 PPM decreased the same. Application of cycocel (500 ppm) recorded significantly higher number of nodes and number of branches followed by NAA (20 and 40 ppm). The treatment with growth regulators NAA (20 and 40 ppm) and miraculan (2000 ppm) significantly increased the growth parameters viz., leaf area, LAI, SLW, LAR, BMD and Lad. The application of growth regulators, chemicals and nutrients significantly increased RGR and CGR. The leaf area, LAI, CGR, SLW, BMD showed a significant positive correlation with seed yield. The application of NAA @ 0.5 and KNO_3 @ 0.5% as compared to control. The application of growth regulators, chemicals and nutrients significantly increased the number of seeds per plant, number of pods per plant, pod weight, pod length and harvest index and these parameters showed a significant positive correlation with seed yield. Among the treatments, NAA @ 20 ppm is more effective and economical in mothbean.

Physiological Basis of Yield Potential in Promising Groundnut (*Arachis hypogaea* L.) Genotypes)

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ABSTRACT

A field experiment was conducted during kharif 2000 under rainfed conditions at the main Research Station, University of Agricultural Sciences, Dharwad to study the "Physiological basis of yield potential in promising groundnut genotypes". The experiment consisted fifteen genotypes as treatments laid out in a randomized block design with three replication on medium black soil to screen for various morpho-physiological, growth parameters biochemical, yield and yield components.

The genotype JL 86350-79, TMV-2 and DH-22 possessed significantly higher plant height as compared other genotypes and the minimum plant height was recorded in DH-86. The genotype DH-53 recorded higher number branches and lowest was observed in genotype, DH-74.

Leaf, stem reproductive part and total dry matter were more in the genotype GPBD-4. Significantly higher leaf area and leaf area index was noticed in the genotype DH-74 genotype GPBD-4 recorded highest leaf area ratio (LAR) and was followed by DH-74. Significantly highest AGR, CGR, RGR and NAR values were recorded in the significantly with respect to SLW and SLA at all the stages. SLW was highest in GPBB-4 while SLA was highest in the genotype DH-86.

Among the biochemical parameters, chlorophyll content, nitrate reductase activity and oil content were highest in the genotype GPBD-4 and lowest was in DH-75. The genotype differed significantly with respect to pod yield and T yield components. Among the genotypes GPBD-4 recorded higher pod yield, yield components. While, DH-86 recorded lowest values of pod yield and yield components.

Effect of growth Regulators on Growth, Physiology and Yield in Chickpea (*Cicer arietinum* L)

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ABSTRACT

A field experiment was conducted at Main Agricultural Research Station, University of Agricultural Sciences, Dharwad during kharif 2001 to study the influence of different growth regulators, on various morpho-physiological, biochemical traits, yield and yield components in chickpea genotypes. The experiment was laid on in factorial randomized block design using four growth regulators (GA_3 , NAA, Miraculum and Cycocel) at different concentrations with three replications.

Significant differences were observed for various morpho-physiological, biochemical and yield and yield attributes due to the application of growth regulators. Significant increase in plant height, dry matter in leaf, stem and reproductive parts and total dry matter was recorded due to the application of plant growth regulators. The growth parameters viz. LAI, AGR, CGR, RGR, NAR, SLW and LAD increased significantly with the application of NAA (40 and 60 ppm), lihocin (500 ppm) and cycocel (500 ppm). The biochemical parameters viz., total chlorophyll contents nitrate reductase activity improved significantly due to the application of growth regulators NAA (40 and 60 ppm), lihocin (500 ppm), cycocel (500 ppm) and salicylic acid (50 ppm).

Seed yield also recorded significantly higher with NAA (40 and 60 ppm) followed by lihocin (500 ppm), cycocel (500 ppm) and salicylic acid (50 ppm) and the increased yield was due to higher number of seeds per plants, number of pods per plant, test weight and harvest index. The correlation studies indicated as significant positive association between seed yield and total chlorophyll content, NRA, leaf dry weight, TDM, AGR, CGR, RGR, NAR, LAD and SLW. From the point of economics application of NAA (40 and 20 ppm) was more economical.

Effect of Growth Regulators on Growth, Yield and Quality of Brinjal (*Solanum melongena* L.)

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ABSTRACT

A field experiment was conducted at Main Agricultural Research Station, University of Agricultural Sciences, Dharwad during kharif 2001 to study the influence of different growth regulators, on various morphological, physiological, biochemical, yield and yield components in brinjal. The experiment was laid out on randomized block design using four growth (GA_3 , NAA, Miraculum and Cycocel) at different concentrations with three replications.

Growth regulators significantly influenced the morphological characters such as plant height, number of braches per plant, number of leaves per plant and stem diameter. Further, the plant height and number of leaves per plant were significantly higher with GA_3 (50pp) followed by NAA (75ppm). The leaf dry weight and stem dry weight were significantly higher with application of GA_3 (50 ppm) followed by NAA (75 ppm). Similarly total dry weight of the plant was significantly influced by GA_3 (50 ppm) followed by NAA (75 ppm) compared to control.

The growth regulator GA_3 (50ppm) and NAA (75ppm) revealed significantly increased LAI, AGR, CGR and NAR at 60-90 DAT. Cycocel (100 ppm) exhibited higher chlorophll content comapared to control.

The results on various phenological chracters by the application of growth regualtors were non significant except number of flower per inflorescence. Among the growth regulator, GA_3 (50 ppm) followed by NAA (75 ppm) and GA_3 (25ppm) recorded higher number of flowers per inflorescence.

The results of various yield and yield attributes indicated that all the yield contributing characters viz., fruit length, fruit breadth, number of fruits per plant average fruit weigh and fruit yield per plant (kg) increased significantly due to growth regulators treatments. It s concluded that the application of GA_3 (50 ppm) followed by NAA (75 ppm) was more effective in increasing the yield potential.

Genetic Studies in Pop Sorghum

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ABSTRACT

Pop sorghum belongs to Roxburgii group of sorghum and is cultivated and consumed next only to grain sorghum because of their economic and nutritive value. Exploitation of existing genetic variability is a prerequisite for any crop improvement. Present study was undertaken to evaluate 178 cultivars collected from North Karnataka. These with three checks viz., CSH-16, DFJ-1 and SPV- 462 were grown in augmented design with three replications during khariff 2001 at MRS, Dharwad to assess genetic diversity, variability, correlation for 13 characters.

There was considerable range of variation in the genotypes for the 13 characters studied. The character viz., fodder yield/plant, grain yield/plant, number of leaves, number of primaries, flake size, expansion ratio and popping yield exhibited high GCV, PCV and high heritability coupled with high genetic advance. Correlation studies indicated that days to 50% flowering, plant height number of leaves, panicle breadth, panicle weight, fodder yield/plant, number of primaries and 1000-grain weight are the important components of grain yield, while expansion ratio and flake size are the important components of popping yield. Among the characters studied, panicle weight had the highest direct positive effect on grain yield followed fodder yield and panicle breadth.

Using D^2 analysis of Mahalanobis (1936), 178 genotypes were grouped into 13 clusters. Cluster II was the biggest with 76 genotypes followed by cluster I, IV, III, V and VII with 47, 24, 10, 8 and 6 genotypes respectively. Remaining were solitary clusters. Intra cluster D^2 values ranged from 32.13 (VI and VII) to 151.92 (V and XI). Inter cluster distance was maximum in cluster IV (45.15) and least in cluster V (36.64). Based on the overall ranking for each cluster across mean values of 13 characters, cluster XII ranked first followed by cluster III, IV and VI, Genotypes involved these cluster can be used for future breeding programme. In the present study, no definite relationship was between geographical distribution of genotypes and the genetic diversity.

Biometrical Basis of Handling Segregating Populations for Improving Productivity in Onion (*Allium cepa* L)

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ABSTRACT

The investigation was carried out during kharif 2001 at the Botany Garden, College of Agriculture, Dharwad to assess the biometrical basis of handling segregating populations for improving productivity in onion. In order to assess the biometrical basis of handling segregating populations, the parental materials were selected based on combination representing viz. a) high GCA and high SCA (C_1F_2), b) high GCA and low SCA (C_2F_2), c) low GCA and high SCA (C_3F_2), d) low GCA and low SCA (C_4F_2)¹The heritability parameters were high in C_1F_2 populations for all traits indicating the presence of additive type of genetic variance.

The heritability and GAM were high in CF_2 and C_2F_2 for bulb yield, number of leaves per plant, plant height and equatorial diameter. All the characters were associated positively with bulb yield except shape index, but only equational diameter and polar diameter had maximum positive direct effect on bulb yield in all the four populations. Hence these characters could be considered while making selection for bulb yield. The correlations among yield traits and their path did not differ in the different segregating populations.

The higher numbers of transgressive segregants were recorded in C_1F_2 and C_2F_2 populations for bulb yield indicating that, it was mainly due to high parental GCA. The results of present investigations reveal that, though all the populations were derived from the crosses with high per se performance and genetic diversity, higher variability was exhibited in the F_2 population of those courses whose parents had high GCA. Hence in order to generate wider variations and isolate higher transgressive segregants parents were selected by considering their GGA apart from SCA, per se performance and genetic diversity.

Molecular Characterization of Insecticidal genes in Native *Bacillus thuringiensis* Isolates

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ABSTRACT

The present study was conducted to assess the molecular diversity and to characterize the cry gene profile of native *Bacillus thuringiensis* isolates. Nine isolates of *B. thuringiensis* and three reference strains were characterized by PCR-Product profiles using random primers obtained from Operon Technologies, USA. The nine primers used for assessing the molecular diversity among the isolates generated 169 bands, all polymorphic (100% polymorphism). Among the nine primers, the primer OPC-18 had the lowest minimum (0.00) and least average (0.308) genetic similarity values. Hence, it can be used to distinguish the isolates and fingerprint the *B. thuringiensis* isolates used in this study. The isolates were also characterized by PCR Product profiles using cry specific primers to understand the distribution of cry genes in the isolates. Cry¹ and cry⁷ were found in HD1, P1, D1, PP10, PP11 and PP12; cry 8 and cry9B were present in HD1, D1 and PP12; cry 9A was found in Bt42, T2 and PP41; cry9C in HD1, P1, T2 and PP12; cry¹¹ in PP14 and S13. The nem and cry genes were found in TN and S13 respectively. PCR amplification with cry 1 A(c) specific primers revealed the presence of the gene in HD1 P1, D1, PP11 and PP12. The isolated P1 and D1 had two distinct plasmid bands of size 18.3kb and 12.8kb and the reference strain HD1 had seven distinct plasmid bands of size 25.33, 17.84, 11.57, 7.08, 4.91, 3.5 and 1.506 kb. Plasmid DNA library of isolate P1 was generated in p SK + vector. Of the 40 clones PCR tested with a cry¹ general primer, 26 showed the presence of cry¹ genes.

Studies on Induced and Recombinational Variability in Dicoccum Wheat (*Triticum dicoccum schrank* Suhulb)

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ABSTRACT

An investigation was carried out during rabi season of 2001 to assess the extent of variability released by hybridization, mutagenesis, hybridization followed mutagenesis and to study the association pattern among the component traits of seed yield under timely (D_1) and late sown (D_2) conditions. Two crosses viz., DDK 1001 XMACS 2928 (C_1) and DDK 1009 XDDK 1013 (C_2) were used to generate F_3 and F_3M_3 generations and also M_3 s of DDK 1001 and DDK 1009. The segregating populations were evaluated for ten quantitative traits including seed yield.

The yield levels of different segregating population hardly differed under timely and late sown situations. The mean values did not differ much among the populations within respective crosses. Wide range was observed in F_3M_3 populations of both the crosses under both sowing conditions. The variability parameters like GCV, PCV heritability and genetic advance got reduced under D_2 in C_1 populations than in C_2 . Slightly high GCV and PCV for seed yield (SY) and its components traits like, plant height (PH), spike length (SL), productive tillers (NP), grains per spike (GPS) and thousand seed weight (TSW) suggests C_1 populations as potential sources to isolate variations was observed for SY, NP and GPS accompanied by high heritability and genetic gain. Irrespective of cross and sowing time, variation was slightly more in F_3M_3 than in F_3 or M_3 .

Highly significant positive correlation of SY was observed with NP, SL and GPS. The association pattern has been observed to change from F_3 to F_3M_3 either on favourable side or on unfavourable side. More number of favourable correlations are observed in C_2 under both the sowing conditions. Transgressive families recorded for SY, NP and TSW were numerically higher in F_3M_3 than F_3 or M_3 both in C_1 and C_2 under both the sowing conditions. Number of transgressive families were relatively more in C_1 than number of resistant lines in F_3M_3 of C_1 .

Effect of Macro and Micro Nutrients and Growth Regulators on Plant Growth, Seed Yield and Quality Of Bell Pepper Cv. California Wonder

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ABSTRACT

A field experiment was conducted at Main Research Station, University of Agricultural Sciences, Dharwad on the effect of macro and micro nutrients and growth regulators on plant growth, seed yield and quality and to know the effect of seed treatment with growth regulators and micronutrients on viability and vigour of Bell pepper Cv. California Wonder. It consisted of two fertility levels, eight growth regulators and micronutrient sprays and one control with three replications. Another experiment consisted of 16 seed treatment chemicals with four replications in CRD design. A fertilizer dose of 300: 180: 150 kg NPK/ha gave the highest plant height, more number of leaves, number of branches and dry weight per plant. This fertility level also recorded significantly more number of fruits (6.70/plant) and seed yield (5.73 g/plant and 185.85kg/ha) which was 10 per cent higher over other doses of fertilizer (2.50: 150: 125 kg NPK/ha).

Among the growth regulators GA₃ 100 ppm recorded the highest plant height, number of leaves and number of branches per plant followed by GA₃ + Cytokinin (50 ppm each), NAA 40 ppm and Miraculon 1000 ppm. Number of seeds (224.63 / fruit) and seed yield (5.92 g/ plant and 200.18 kg/ha) were significantly higher with GA₃ 100 ppm which increased 19.35 per cent over control. Interaction between fertility levels and growth regulators had no significant influence on seed yield and quality parameters. However, two sprays of GA₃ 100 ppm given at 45 and 80 DAT with 300: 180: 150 kg per ha had given maximum fruit yield, seed yield and quality parameters. Significantly higher seed germination (91.75, 91.50%) rate of germination (12.75, 10.92), root length (5.55, 5.07 cm), shoot length (7.50, 7.00 cm), seedling dry weight (5.3, 5.0, 49.50 mg/10) and Seedling vigour index (117, 1144) were recorded when seeds treated with GA₃ 200 ppm and KNO₃ (1.0%) respectively over other growth regulators and micronutrients seed treatment.

Influence of Phosphorus, Micronutrients and Growth Regulators on Growth Seed Yield and Quality of Pea (*Pisum sativum* L.)

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ABSTRACT

A field experiment was conducted at Main Research Station, University of Agricultural Sciences, Dharwad during rabi 2001, to study the influence of phosphorus, micronutrients and growth regulators on growth, seed yield and quality of pea cv. Arkel. This consisted of two factors viz., one factor as three phosphorus levels (40,60 and 80 kg/ha) and another factor as four micronutrient treatments(ZnSO₄ 20kg, Ammonium molybdate 1 kg, Sulphur 10 kg and Boraz 10 kg/ha) and a control. In another experiment having one factor as four growth regulators (NAA 50 ppm, IAA 50 ppm, GA₃ 50ppm and Ethrel 200 ppm) and a control with three stages of spray (30, 45 and 60 DAS) as another factor. Both the experiments having three replications and laid out in randomized block design in factorial concept.

The results indicated that significantly higher growth components and higher yield components viz., pods per plant (7.86 and 7.79), dry pod weight (7.16 and 7.09 g), seeds per pod (5.74 and 5.53), 100 seed weight (18.61 and 18.56 g) and seed yield (1784 and 1777 kg/ha) were recorded with separate soil application of 80 kg phosphorus per ha and zinc sulphate 20 kg per ha, respectively. Similarly, per ha and zinc sulphate 20 kg per ha, respectively. Similarly, these recorded higher seed quality parameters. However, the combination of 80 kg phosphorus with 20 kg zinc sulphate per ha gave maximum seed yield (1856 kg/ha).

In second experiment; GA₃ 50 ppm foliar spray recorded higher growth parameters, followed by NAA 50 ppm. Foliar spray of NAA 50 ppm gave maximum pods per plant, seeds per pod, dry pod weight and seed yield per ha (1797 kg), whereas GA₃ 50 ppm recorded significantly higher seed quality parameters. Among the stages, spray given at 45 DAS gave significantly higher seed yield and quality parameters.

Effect of Spacing and Fertilizer Levels on Growth, Seed Yield and Quality in Radish (*Raphanus sativus* L.)

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ABSTRACT

The experiment was laid out in split plot design with 26 treatment combinations involving two spacings viz., 60x30 cm and 60x45 cm as main factor and 13 fertilizer levels (Three N levels i.e., 95, 115 and 130 kg, two P levels i.e., 45 and 55 kg, two K levels i.e., 45 and 55 kg per hectare and RDF as control) as sub factor. The results revealed that closer spacing 60x30 cm) significantly increased the leaf area index (7.67) while, wider spacing 60x45 cm) significantly increased number of branches per plant (9.25). Higher fertilizer level (130:55:55 NPK kg/ha) significantly increased the plant height (124 cm), number of branches per plant (9.47), leaf area index (7.51), delayed 50 per cent flowering (69.7 days), maturity (109 days), seed yield per plant (12.3 g), per hectare (5.13 q) and test weight (9.9 g) compared to RDF. Though the seed yield per plant was significantly higher (11.7 g) in wider spacing, but the closer spacing recorded significantly higher speed yield per hectare (5.07q). The interaction due to spacing and fertilizer levels was non-significant, Significantly higher germination (93.3 and 97. 1%), field emergence (86.92 and 90.4%), seedling vigour index (1628 and 1853), seedling dry weight (10.75 and 12.06 mg/10 seedlings) and lower EC (0.48 and 0.43 dSm⁻¹) were recorded by seeds produced with wider spacing was non-significant for all seed quality traits. From the study, it can be concluded that for nucleus and breeder seed production of radish, a fertilizer level of 130:55:55 kg NPK per hectare with wider spacing of 60x45 cm is beneficial while, for certified seed production the same fertilizer level be adopted with closer spacing of 60x30 cm.

Effect of Distillery Yeast Sludge as a Source of Nitrogen on Growth and Yield of Cabbage and Soil Properties

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ABSTRACT

A field experiment was conducted at Garag village of Dharwad district during rabi 2001-02 on clay soil to study the effect of distillery yeast sludge as a source of nitrogen on growth and yield of cabbage and soil properties. The treatments consisted of three sources of nitrogen (ureas, DYS and FYM) and their combination at different levels. The experiment was laid out in randomized complete block design with ten treatments replicated thrice. Among various treatments, maximum number of leaves (24.37), plant spread (33.31 cm) and head yield (38.67 t/ha) were recorded in the treatments 100 per cent N through urea. However, the results obtained were on par with the treatments receiving 50 per cent N through DYS+ 50 percent N through ureas. The protein and ascorbic acid contents of cabbage were not influenced by the different sources of nitrogen.

The soil analysis after the harvest of crop revealed that the soil physical properties were not significantly influenced by the treatments. The maximum available N (341.4 kg/ha) in soil was noticed in the treatment 100 per cent N through DYS. The highest available P and K content were observed in the treatment 100 per cent N through FYM. The micronutrient content of soil remained unaffected. The highest microbial population and enzymes activity (dehydrogenase and urease) were recorded in the treatment 25 per cent N through DYS + 75 per cent N through FYM and was on par with 50 per cent N through DYS + 50 per cent N through FYM treatment.

Economic analysis indicated that application of organic sources of nitrogen increased the cost of cultivation. The highest net returns (Rs. 62086) were obtained in the treatment 100 per cent N through urea. Whereas, the highest B:C ratio (3.71) was observed in the treatment 50 per cent N through DYS + 50 per cent N through urea.

Clay Mineralogy of Some Associated Red and Black Soils of Northern Karnataka

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ABSTRACT

Six soil profiles from three sites of Northern Karnataka viz., Main Research Station Dharwad in Dharwad district, Bheemaranagudi in Gulbarga district and Mantagani in Haveri district were collected to study clay mineralogy and weatherizing status of these soils. Clay mineralogical studies were made by X-ray diffraction and mineralogical studies were made by X-ray diffraction and weathering status was assessed based on $\text{SiO}_2/\text{R}_2\text{O}_3$ molar ratios.

Structure is predominantly sub-Angular blocky and Angular blocky in subsurface horizon of Bheemaranagudi black pedon. Slickensides were common feature in black pedons and their intensity were more in middle of the solum. Free iron oxides were more in red pedon compared to the associate black pedon. Among the sites, Bheemaranagudi had low amount of free iron oxides as it devoid of iron bearing minerals while free calcium carbonate was more at Bheemaranagudi than Dharwad and Mantagani sites. Sometime content was relatively more over other clay minerals in all the pedons except in red pedon at Dharwad, which contained more of kaolinite. Some time was relatively more dominant in black pedons than associated red pedons. Kaolinite was identified in all the pedons. However, the XRD peak for the mineral was found sharp in the red pedons indicating good crystallinity of the mineral. Vermiculite was identified in all the pedons except in red pedon of Dharwad. 1.0-1.4 mm mixed minerals existed in Ap1 horizon of Bheemaranagudi red pedon. Chlorite was not a common mineral in these pedons, however it was very conspicuous in Ap1 horizon of Bheemaranagudi black pedon.

Among the primary minerals, generally Mica content was relatively more followed by Quartz, K-feldspar and Na-feldspar in all the pedons. $\text{SiO}_2/\text{R}_2\text{O}_3$ molar ratios of the soil was higher for black soil when compared to associated red soils indicating red soils are more weathered than black soils. $\text{SiO}_2/\text{R}_2\text{O}_3$ molar ratios of red pedon of Dharwad was lower compared to red pedons at other sites, indicating more weather status.

Survey of Indigenous Practices for the Management of Pests in Raichur District and Evaluation of Few Practices Against Okra Pests

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ABSTRACT

Studies were undertaken at College of Agriculture and Regional Research Station, Raichur during 2001-2002 to document indigenous practices followed in Raichur district and to evaluate few practices against okra pests with its impact on occurrence of natural enemies.

Survey revealed an array of 98 indigenous practices adopted by the farmers in the region to manage the pests. Which are gathered, catalogued and documented on crop wise basis. Field evaluation studies revealed that NSKE + Cow Urine-, Garlic extract + Chilli extract Cow Urine, Garlic extract + Cow Urine, Neem oil + Garlic extract and *Clerodendron* extract *Vitex* extract were effective as that of oxydemeton methyl against leafhoppers and aphids. Where as, Neem oil + Garlic extract, Garlic extract + Cow Urine and NSKE + Cow Urine treatments were effective against whitefly and mites.

Garlic extract + Chilli extract + Cow Urine, NSKE + Cow urine, *Clerodendron* extract + *Vitex* extract, Garlic extract + Cow Urine and Neem oil + Garlic extract treatments were effective with minimum fruit damage by fruit borers. Garlic extract + Chilli extract + Cow Urine, NSKE + Cow Urine recorded higher yield next to endosulfan in imidacloprid seed treated plot. All the indigenous components including insecticide treatment (oxydemeton methyl) showed non-significance difference on occurrence of natural enemies indicating safety to spiders, *Chrysoperla* and coccinellids after seven days of application. Highest B:C ratio of 18.99 and 14.68 was recorded in NSKE + Cow Urine and *Clerodendron* extract + *Vitex* extract treated plots respectively as compared to oxydemeton methyl (1 6.62) treatment in plot without seed treatment against sucking pests but in imidacloprid seed treated plot they were next to endosulfan (21.50).

Studies on Soybean Anthracnose Caused by *Colletotriclum truncatum* (Schw.)

Andrus and Moore

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ABSTRACT

Among the several diseases affecting soybean crop, anthracnose caused by *Colletotrichum truncatum* (Schw.) Andrus and Moore is a major constraint in soybean cultivation. Therefore, the present investigation was carried out with different objectives aiming at the control of this disease.

Among the 24 soybean seed samples of 15 genotypes collected from Bangalore, Dharwad, Nippani, Sankeshwar, Ugar khurd, Coimbatore, Guntur and Indore recorded the mean *C. truncatum* seed infection of 2.0, 3.92, 6.75, 4.08, 4.25, 0.50, 5.17, and 3.25 per cent, respectively. Seed to plant transmission study of the fungus revealed 10 per cent seed rotting and seven per cent hypocotyl infection. The relation of soybean plant age to anthracnose severity revealed the maximum disease severity of 39.25 per cent on 40-day-old seedlings. Development of fruiting bodies on infected symptomless soybean stem pieces are obtained by dipping the stem pieces in different concentrations of paraquat and maximum (abundant) acervuli were produced on stem pieces dipped in 2.5 per cent paraquat.

The reaction of different pulses and weeds to soybean isolate of *C. truncatum* indicated that *Phaseolus vulgaris* among beans, *Amaranthus viridis*, *Physalis minima*, *Solanum nigrum* and *Acalypha Indica* among weeds showed infection. Among the 15 plant extracts evaluated in vitro Parthanium was found superior in inhibiting the germination of spores of the fungus (74.43% Out of 10 fungicides tested in vitro benomyl and carbendazim (100 %) among the systemic fungicides and SAAF (92.22 %) among the non-systemic fungicides were found effective. From the field evaluation of 10 fungicides, it was observed that either benomyl or carbendazim seed treatment at the rate of 2 g / kg of seed along with two foliar applications at 0.1 per cent on 30 and 45 days after sowing, was found effective in controlling the disease. Screening of 60 genotypes under greenhouse condition revealed that only three genotypes PK 1129, DSb 2 and cockerstaurt were found to be resistant.

Epidemiology and Crop Loss Assessment of Sterility Mosaic Virus Disease of Pigeonpea (*Cajanus cajan* (L.) Millspaugh) in North- Eastern Karnataka

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ABSTRACT

The survey was conducted for monitoring the incidence of sterility mosaic virus disease during 2000-01 and 2001-02 in major pigeonpea growing taluks of Gulbarga and Bidar districts. The results revealed an average incidence of 49.35%, in Bidar district and 30.98%, in Gulbarga district over two years. The maximum disease incidence was recorded in Bhalki taluk (54.35%) followed by Bidar (54.30%), Chincholi (53.10%), Humnabad (47.60%), Basavakalyan (41.30%) and remained least in Afzalpur taluk (13.05%).

The cumulative rainfall of summer months (Dec.-April) and monsoon months (May-Nov.) showed positive correlation with SMVD incidence over two years (2001 and 2002) in both the districts. The minimum temperature and cumulative rainfall showed positive significant correlation with SMVD incidence, whereas maximum temperature and minimum RH showed negative correlation. The mean incidence of SMVD from four taluks of Gulbarga district recorded maximum in June I fortnight crop sown (43.02%) followed by July II fortnight (42.0%), July I fortnight (39.7%), whereas least incidence was observed in August I fortnight sown crop (8.7%).

Physiological changes due to SMVD at different growth stages revealed maximum plant height, primary branches, leaf area, fresh weight and dry weight in healthy pigeonpea plants in comparison with SM- infected which showed 30.7%, 23.9%, 21.5%, 36.3% and 36% reduction in plant height, primary branches, leaf area, fresh weight and dry weight respectively. The SM-infected plant showed 22.3% increase in the number of secondary branches. The biochemical changes by SMVD revealed that SM-infected plants showed 30.9% reduction in chlorophyll a content, 18.6% reduction in chlorophyll b content, 32.13% reduction in phenolic content and 24.0% increase in reducing sugars in comparison with healthy plants.

The results on crop loss assessment to SMD revealed maximum plant height, shoot dry weight, pods/plant, pod dry weight in healthy plants in comparison with partially SMD infected plants. The loss in yield was maximum in 12 and above branches infected plants (97.5%) followed by 8-12 branches infected plants (81.5%) and least reduction was observed in 2-4 branches infected plants (26.6%). The annual revenue loss due to SMVD incidence was estimated to be 429.4 tonnes values at Rs. 73,01,010.5 and 263.3 tonnes valued at Rs. 44,77,460 in Bidar and Gulbarga district respectively.

Effect of Micronutrient Supplemented Azospirillum Biofertilizers on Maize (*Zea mays* L.)

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ABSTRACT

Attempts were made to study the effect of micronutrients on the growth and survival of *Azospirillum brasilense* strains and their combined effect on maize under pot culture conditions. Initial laboratory experiments were conducted to study the effect of different concentrations of micronutrients, individually and in combinations on the growth of *A. brasilense* strains under liquid culture conditions. The results revealed that, supplementation of zinc @ 100 ppm has supported a maximum log viable cell counts in strains ACD 20 and ACD 15, whereas maximum growth of ACD L4 was noticed due to addition of iron to the both. Addition of 100 ppm of micronutrients as individual and in combination significantly improved the invitro nitrogen fixation efficiency of all three strains. The higher invitro nitrogen fixation was observed in the broth supplied with 100 ppm of Zn + Fe + Mo over control. Later, two strains of *A. brasilense* (ACD 20 and ACD L4) were tested for their survival in lignite carrier supplied with micronutrients for 90 days. Results revealed that, addition of 100 ppm of Zn + Fe + Mo combination supported highest survival of *Azospirillum* strains over control.

Based on the observations made under laboratory conditions, pot culture experiment was designed to study the effect of micronutrient supplemented *Azospirillum* biofertilizers, as seed treatment and soil application on maize. Results obtained from pot trial revealed that, inoculation of combination of Zn + Fe + Mo along with *A. brasilense* strains gave significantly higher dry matter production, N content and uptake, endorhizosphere *Azospirillum* spp., iron uptake and grain yield of maize. Results of Mo uptake revealed that, the maximum uptake of Mo was recorded due to inoculation of *Azospirillum* strains in combination with Mo over uninoculated control.

**Effect of Micronutrient Supplemented Bradyrhizobium Biofertilizers on Soybean
(*Glycine max* (L.) Merrill)**

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ABSTRACT

Attempts were made to study the effect of micronutrients on the growth and survival of *Bradyrhizobium japonicum* strains and their combined effect on soybean under pot culture conditions.

Initial laboratory experiments were conducted to study the effect of different concentrations of micronutrients, individually and in combinations on the growth of *B. japonicum* strains under liquid culture conditions. The results revealed that, supplementation of zinc @ 75 ppm has recorded maximum log viable cell counts in strains SB- 120 and VC-1 whereas strain USDA 24M1 has recorded maximum log viable cell counts upon addition of Mo @ 75 ppm when compared to control. Later, two strains of *B. japonicum* (SB-120 and USDA 24M1) were tested for their survival in lignite carrier supplied with micronutrients for 90 days. Results revealed that, addition of zinc @ 75 ppm recorded maximum survival of strain SB-120, whereas addition of Mo @75 ppm supported maximum survival of strain USDA24M1 When compared to control. Based on the observations made under laboratory conditions, pot culture experiment was designed to study the effect of micronutrient supplemented *Bradyrhizobium* biofertilizers, as seed treatment and soil application on soybean. Results obtained from pot trial revealed that, inoculation of *B. japonicum* strains alongwith zinc + molybdenum increased the nodule number, nodule dry weight and nodule N content. Whereas leghaemoglobin content was increased due to inoculation of *B. japonicum* strains along with molybdenum. Combination of zinc, molybdenum and iron along with inoculation of *B. japonicum* strains increased the shoot and root dry weight, zinc and iron uptake by soybean. Higher molybdenum uptake was noticed due to inoculation of *B.japonicum* strains along with molybdenum. Inoculation of *B. japonicum* strains and Zn + Fe + Mo resulted in an increased grain yield of soybean over control.

Bioethanol Production from the Pods of *Samanea saman* (Jacq.) Merr.

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ABSTRACT

Ethanol is being blended with petrol or diesel @ 20% in transportation in order to conserve the natural resource and reduce the cost. Molasses is the only major source for producing ethanol, which is available at a high cost. From the preliminary observations, it was evident that the pods of *S. saman* consist of reducing sugars in appreciable amount. Hence, the present study was conducted to know its potential and to optimise the parameters for ethanol production. Various pretreatment methods were tested for obtaining maximum reducing sugars. The aqueous extraction with and without heat treatments, fungal and alkali pretreatments methods yielded less amount of reducing sugars as compared to acid pretreatment. Acid pretreatment @ 1.5% was found to be effective in releasing reducing sugars. Increase in reducing sugar was significant up to 8 hrs of incubation period, beyond which increase was not significant. Hence, acid pretreatment was followed for further studies for ethanol production.

Among the yeast strains screened, BCY-108, *Candida wickerhami* NCIM 3463 and *Kluyveromyces marxianus* NCIM 3551 recorded highest ethanol yield with corresponding decrease in residual reducing sugar. These three strains were further used to optimise fermentation parameters. The fermentation period of 5 days, pH of 4.5, temperature of 30°C and 1.5 per cent inoculum level were optimum for production of maximum ethanol as compared to control. The BCY-108 yeast strain was efficient as compared to other yeast cultures. For further enhancing the ethanol production, acid hydrolysate was supplemented with zinc sulphate, ammonium sulphate, orthophosphoric acid and sodium dihydrogen orthophosphate. Among these nutrient supplementation, ZnSO₄ @ 10 mg L⁻¹ stimulated maximum ethanol yield of 29.849 g L⁻¹. Based on these parameters, a pilot scale fermentor of 3L capacity was set in three replications. The hydrolysate containing 35.26 g L⁻¹ of reducing sugars yielded an average of 30.44 g L of ethanol and 0.72 g L of residual reducing sugars, indicating 97 per cent conversion. Thus, it can be concluded that pods of *S. saman* can be successfully used for ethanol production.

Marketing of Eucalyptus in Karnataka - An Economic Analysis

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ABSTRACT

Eucalyptus was introduced to India as early as 1790 in Nandi hills of Karnataka. Eucalyptus have been in demand due to their multifarious uses. The present study pertains to three eastern plain districts namely, Dharwad, Gadag and Haveri in Karnataka state. In the first stage two taluk from each district in second stage three villages from each taluka and in third stage two eucalyptus growers from each of these villages were selected randomly. The analytical technique included were Lorenz curve technique, multiple regression and tabular analysis.

The market structure for sales of eucalyptus poles in Alnavar and Haliyal depots showed a co-efficient of inequality of 0.343 and 0.358 respectively. Similarly, the market structure for eucalyptus pulpwood sales from KFD and KFDC indicated the co-efficient of inequality at 0.236 and 0.321 respectively, for the year 1995-96. The sales pattern by farmer showed that. 319.50 tonne sold Directly to enduser industries and 336 tonne through pre-harvest contractor to enduser industries. The KFD and KFDC sold entire production the year directly to pulpwood industries. The marketing cost incurred by producer was higher in the sales made through preharvest contractor and it is least in the case of sales directly to the end user agencies. The produce sold by government agencies directly to the pulp wood agencies found to be more efficient compared to other agencies.

The economics of eucalyptus indicated that as the stage of harvest increases, the net return also increases. The optimum year of harvest is found to be at 5-6 years old plants stage. The factors influencing the eucalyptus price of farmer were quantity sold and age of the plant sold. The farmers opined high harvest cost, quality restriction by industries, limited buyers, lack of information about prices of wood and lack of auction centers as a marketing problems.

Efforts may be made to extend the auction sales for eucalyptus in farmers field to get better price. It is also recommended to farmers to establish their own association co-operatives to protect from exploitation.

Production and Marketing Management of Fodder in Dharwad District

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ABSTRACT

Fodder is the life of cattles, Indian fodder resources are able to meet only 46.60% of the requirement. The major portion was contributed by the crop residues viz., maize, sorghum, wheat, ragi etc. In Karnataka, an increasing trend of fodder production has been observed during the last decade. Further, the growth achieved is different in different points of time and region. Keeping in view, the importance of fodder production in Karnataka, the study was carried out to evolve the efficient management of fodder in dairy forms to bridge demand and supply gap and increase the fodder production. The study was also carried out to estimate the demand and supply of fodder in Karnataka and analyse the cost and return structure in production. Some important marketing channels and constraints in production and marketing of fodder were identified.

The study was conducted in Dharwad district of Karnataka and was based on both primary and secondary data. The primary data for the year 2000-01 were collected through personal interviews from 45 farmers and 15 middlemen. The secondary time series data on availability and requirement of fodder (from 1989-90 to 1998-99) were collected from the Directorate of Economics and Statistics. The data were analysed using simple linear regression and tabular analysis. The results indicated that demand for green fodder increased at an average of 91% but supply increased at 1.81%. The gap between the demand and supply of cultivated green fodder was 92.27% in 2002-03 and it is supposed to increase at 92.95% by 2010-11 A.D. Whereas, it was 24.69% for dry fodder in 2002-03 and is supposed to increase at 21.65% by 2010-11. Cost and return estimation revealed that variable cost accounts for 75% of total cost. The two important marketing channels were identified. In channel-I, the producers sell their fodder directly to consumer while in channel-II, the producers sell their fodder to consumer through village-merchant cum commission agents. The marketing cost involved in channel-II was more than in channel-I.

Economics of Contract Farming in Vegetables – A Case of Belgaum District

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ABSTRACT

Contract farming can be described as a half way house between independent farm production and corporate farming. The study was undertaken in Belgaum district of Karnataka. Two taluks viz., Belgaum and Bailhongal, 15 villages from these two taluks were selected where contract farming was practiced. All contract farmers and equal number of non-contract farmers were selected. Hence, the total sample size was 150. The study revealed that annual income, family size was 150. The study revealed that annual income, family size and education of the farmers classified them into contract farmer and non-contract farmer in potato, tomato and chilli. Written agreement was used in potato and chilli oral agreement was used in tomato. The total per acre cost of potato cultivation in contract and non-contract farming was Rs. 27,783.00 and Rs.30,256.10 and net returns obtained were Rs. 13,231.61 and Rs. 17,063.90. The total per acre cost of tomato cultivation in contract and non-contract farming was Rs. 31,719.25 and Rs. 36,798.18 and net returns obtained were Rs. 50,136.66 and Rs.-6916.68. The total per acre cost of chilli cultivation in contract and non-contract farming was Rs. 16,156.62 and Rs. 24,286.31 and net returns obtained were Rs. 41,443.38 and Rs. 33,583.69, respectively.

In potato, contract farmer had a negative impact on profitability when compared to non-contract farmer as market price was higher than the contract price. In tomato and chilli, contract farmer had a positive impact on profitability when compared to non-contract farmer as contract price was higher than the market price. The regression coefficients of net returns from contract farming, land under contract, education of the contract farmer and experience of the company were statistically significant and marketing cost was negatively significant. There were several problems faced by contract farmer and contract firm, which can be well handled with proper policy interventions.

Market Dynamic for Tamarind in North Karnataka

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ABSTRACT

Tamarind is identified as one of the non-traditional commercial crop among the perennial trees. Tamarind has multipurpose uses of economic and commercial importance. It has wide application in food as well s manufacturing industry. The demand for Tamarind by individual household may not show appreciable changes but shift in population and consumption pattern has impact on its production and prices. The study pertains to North Karnataka state in general and four districts or eastern plains namely, Bellary, Bijapur, Gulbarga and Raichur in particular. Multi Stage random sampling was adopted in selection of taluks and farmers for collection of primary data. Secondary sources of data were also collected from relevant sources.

The sample district showed average consumption of 20-30 gms of tamarind per day with a sample size of 7 members. Bijapur district exhibited maximum gap of 5680 tonnes followed by Gulbarga in supply. The results indicated surplus production of Tamarind in Bijapur district while less consumption due to alternative sources like lime and tomato. The supply projection showed increased by about 2.5 per cent per annum for the projections 2001 to 2006. The growth rate of area and production recorded was to the tune of 5 per cent, indicating increasing production every year. Hence, it was suggested that there was need to establish processing industry for consumption, export and industrial uses. The projection of area showed increasing trend for the sample districts. The ealsticities indicated that the demand is highly responsive in Bijapur market compared to other markets while it was highly supply responsive in Raichur market compared to other markets while it was highly supply responsive in Raichur market. The cost and returns structure revealed that the total cost was to the extend of Rs. 1062.5 of which 70 per cent accounted for harvesting while marketing cost was to the tune of 30 per cent. The net profit per tree was recorded at Rs. 1180 approximately. Hence, this price could be taken as base price for auctioning of trees by Department of Forests, Government of Karnataka.

Market Structure, Conduct and Performance- A Case of Tamarind in North Karnataka

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ABSTRACT

The origin of tamarind can traced from Eastern Africa But, now it is grown over world. Tamarind is multipurpose species, it is indigenous to tropical Africa. Probably, the Arab traders introduced it to South India. The preset study pertains to four eastern plain districts namely, Bellary, Bijapur, Gulbarga and Raichur in Karnataka state. In the first stage, two taluks from each district, in second stage, two villages from each taluk and in third stage 5 tamarind grower from each of these villages were selected purposively. The analytical technique included were Lorenz curve technique, multiple regression and tabular analysis.

The disposal of tamarind, the dominance of channel-III composing commission agents cum traders which accounted for 59 per cent of farmers selling through channel-III. The market structure for commission agents of tamarind in Bellary, Bijapur and Gulbarga markets showed the coefficient of inequality of 0.301, 0.359 and 0.292, respectively. Similarly, the market structure of wholesalers of tamarind in Bellary, Gulbarga and Raichur markets. The Gini ratio for tamarind was 0.32, 0.301 and 0.345 respectively in the year 2000-01. The channel-III highest marketing cost and margins (233.72 Rs/q and 450.82 Rs/q) followed by channel-II (176.66 Rs/q of cost and 289.37 Rs. of margin). The producer share in the consumer rupee was found to be highest in channel-I (84.77% of consumer net price) and lowest channel-III (60.95%). The ratio of marketing efficiency was found to be 5.56, 2.76 and 1.56 for channel-I, Channel-II and channel III, respectively. The factors influencing the Tamarind spices, the co-efficient of determination was found to be 0.6500 and significant at one per cent level. The problems faced in marketing by producer opined that problems like commission of market functionaries (90%), price fluctuation (78.75%) etc. The market functionaries opined that the problems like commission of market functionaries opined that the problems like low quality (72.72%), high marketing cost (81.81%) etc.

Supply and Demand for Eucalyptus in Karnataka –An Economic Analysis

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ABSTRACT

Eucalyptus plants are of a great importance to developing countries in view of its adaptability in growth and meeting the economic needs of the cultivators. However, due to unorganized sales by the farmers, they were getting low prices. Therefore, there was a need to study the utilization pattern, area, supply and demand for eucalyptus.

In order to achieve the above objectives the primary data for the year 2001-02 and secondary data from 1992 to 2001 was considered to study the utilization pattern, area, supply and demand for eucalyptus. The compound growth rates and trend analysis were employed to study the growth in area, supply and demand for eucalyptus. The results indicated that, the highest quantity i.e. 59.5 per cent was utilized by HPF Harihar because of its dependence only on eucalyptus as raw material. KFDC showed a highest growth rate (0.893%) in area due to the concentration of government to grow more of eucalyptus in 'D' class forests. Similarly KFD showed highest growth rate in supply due to shift of KFD thrust to grow high value timbers by harvesting more of eucalyptus area.

Highest price elasticity (3.85) of supply showed by the total government supply and highest price elasticity (0.20) of demand was found for HPF Harihar. The equilibrium price worked out to be Rs.1718 per metric tonne. The projected gap in supply and demand found to be surplus ranging from 0.09 to 10.61 per cent for all four years. Therefore, it is recommended to continue the supply less quantity from government sectors in order to stabilize the price on one hand and encourage for establishment of eucalyptus based industries in the state to increase the demand on the other. At the same time, there is a need to establish an organized marketing system for eucalyptus trade

Sanitary and Phyto-Sanitary (SPS) Compliance of Vegetables in Belgaum District – A Case of Cauliflower

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ABSTRACT

Cauliflower (*Brassica Oleraceae* var. *botrytis*) is the most popular cole crop among the winter vegetables. It is evident that developing countries are constrained in their ability to export agricultural and food products to developed countries by SPS requirements. The study was carried out in Belgaum district during 2001-02.

In order to study sanitary and phytosanitary compliance of cauliflower crop, primary data viz., area, variety used, intercultural operations, plant protection applications and marketing practices were considered while secondary data included SPS stipulations of different countries, export quantity and value. The results indicated that the quantity and value of cauliflower exported from India to different countries was not static and fluctuated during to different countries export quantity and value of cauliflower exported from India to different countries was not static and fluctuated during 1996-97 to 2000-2001 because of the local demand and price variation in international market.

The SPS stipulation of cauliflower in different developed countries were high when compared to developing countries like India for SPS standards. This could be attributed to the high health consciousness of the people of developed countries.

The results of pesticide analysis revealed that polytrin C-44 (profenofos + cypermethrin) was found to be below detectable limit in both field and market samples of cauliflower. These findings were observed to be very less when compared to the standards of MRL's of different countries.

Therefore, it is recommended to export the farmer's field as well as market sample of cauliflower to different countries without any SPS restriction by considering only polytrin –C44 pesticide and keeping all other things constant. At the same time there is a need to improve the timeliness of harvesting, and cold chain facilities to enhance the export of fruits and vegetables to developed countries.

A Study on the Management of Area Gardens and Marketing Pattern Preferred by the Arecanut Farmers of Shimoga District in Karnataka

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ABSTRACT

The study on knowledge and management practices of arecanut growers of Bhadravathi taluk, Shimoga district was carried in Karnataka during 2001-02. By following proportionate random sampling. 150 arecanut growers were selected and data were collected by personal inter-view method.

The important findings of the study were; majority of the arecanut growers had medium level of knowledge about recommended practices of arecanut cultivation. Regarding adoption level of arecanut growers majority of them belonged to medium adoption category. Out of 150 respondents, only 68 respondents practiced raising of arecanut nursery.

Majority of the arecanut growers were middle aged, 38.66 per cent of the arecanut growers studied up to high school, 28.66 per cent of the arecanut growers were small farmers, 48.66 per cent of the arecanut growers were having high annual income. While, majority of the arecanut growers were having medium level of mass media contact, achievement motivation, scientific orientation and risk orientation. A positive and significant relationship was observed between knowledge level and age, education, land holding, annual income, mass media contact and scientific orientation and risk orientation. A positive and significant relationship was observed between adoption behaviour and age, education, land holding, annual income, mass media contact and scientific orientation. Regarding credit borrowing and repayment pattern, 70.66 per cent of the arecanut growers had borrowed the loan, 69.8 per cent had borrowed the short-term loan and 85.84 per cent of the arecanut growers had repaid the loan and 85.84 per cent of the arecanut growers had repaid the loan in time. Majority of the arecanut growers sold their produce, to gardeners society followed by commission agents and contractors. The major constraints in production, credit and marketing of arecanut faced by growers were price fluctuation (93.33%), non-availability of labour (75.33%), non-availability of technical guidance (70.00%) and high pests and diseases (61.66 %).

An Evaluative Study of Watershed Programme in Pavagada Taluk of Tumkur District in Karnataka

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ABSTRACT

An Evaluative study of watershed programmes in Pavagada taluk of Tumkur district in Karnataka was carried out during 2001-02. Following proportionate random sampling 150 respondents were selected from six villages and data were collected by personal interview method.

The important findings of the study were; majority (46.67%) of the respondents had medium level of knowledge in respect of watershed practices. There was increase in the number of respondents by over 50.00 per cent who had knowledge about watershed practices namely contour bunds, ploughing across the slope, strengthening of existing bunds, water ways, intercrop technique and application of FYM after implementation of the programme.

Regarding adoption level of the watershed practices by respondents it was revealed that majority (54.67%) of them belonged to medium adoption category. There was increase in number of respondents by more than 40.00 per cent who adopted watershed practices namely contour bunds, ploughing across the slope, strengthening of existing bunds and water way after implementation of the programme.

A positive and significant difference was observed in case of production, productivity and cropping intensity of the area between before and after implementation of the programme. Majority of the respondents were middle aged, 26.57 per cent of the respondents studied up to high school, 54.00 per cent of the respondents belonged to nuclear family, 68.00 per cent and 65.33 per cent of the respondents possessed television and radio, respectively, 35.33 per cent of the respondents regularly contacted AAs.

The major constraints in soil and water conservation practices faced by farmers were loss of cultivable area, water stagnation near bunded area and time consuming operations. In case of crop production practice the constraints faced by farmers were non-availability of labour, lack of finance, heavy risk due to failure of monsoon and costly chemicals.

Knowledge Level and Adoption Behaviour of Vegetable Growers with Respect to Integrated Pest Management of Tomato Crop in Kolar District

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ABSTRACT

The study on knowledge and extent of adoption of IPM practices was carried out during 2001-02 in two taluks of Kolar district. By following simple random sampling 150 farmers were selected and data were collected by personal interview method.

The important findings of the study were that major proportion of tomato growers (36.67%) had high level of knowledge about integrated pest management practices while, 33.3 per cent of them had medium knowledge level. Major proportion of tomato growers (42.00%) were medium adopters of IPM practices while, 23.33 per cent of respondents were high adopters of IPM practices. Majority of tomato growers (93.33%) adopted crop rotation with cereals and marigold. Cent per cent of farmers had adopted regular destruction of damaged fruits at each harvest. While, cent per cent of farmers did not adopt the use of pheromone trap. Ninety five per cent of respondents adopted growing pulses on the bunds to buildup natural enemies fauna. Cent per cent of farmers did not adopt the use of NPV. Majority of the farmers (68.00%) adopted chemical control measures using spray. Majority of the farmers (73.33%) were influenced by Agricultural Assistant. Among scheduled socio-psychological characteristics, only scientific orientation exhibited positive significant relationship with knowledge and only mass media use farmers exhibited significant relationship with media use farmers exhibited significant relationship with adoption level of IPM practices of tomato crop. The problems faced by majority of the respondents were fluctuation in faced by majority of the respondents were fluctuation in market price (100%), susceptibility of crop to pest and disease (86.00%) and labour shortage and high wages (62.00%) in the adoption of IPM practices in tomato.

The major suggestions expressed by the adoption of IPM practices were supply of IPM inputs at cheaper/subsidized price (91.33%), availability of IPM input in open market (88.67%), conducting demonstration on IPM in every village (87.33%) and providing detailed information on IPM before commencement of season (54.67%) respectively to popularise it.

Study on the Knowledge Level of Farmers and Extension Personnel About The Ill-Effects of Agricultural Chemicals

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ABSTRACT

Study on the knowledge level of farmers and extension personnel about the ill-effects of agricultural chemical was carried out in Karnataka during 2001-02. By following proportionate random sampling, 120 farmers were selected and data was collected by personal interview method. Extension personnel were given questionnaires at their respective hobbles of which 60 extension personnel mailed by the questionnaires.

The important findings of the study were; 50 per cent of farmers and 36 per cent of extension personnel had medium level of knowledge about ill effects of agricultural chemicals. Ill effects of agricultural chemicals perceived by majority of farmers and extension personnel were killing of natural enemies and beneficial organisms, increase in resistance in pests and weeds, pollution of air and water bodies, effect on soil processes such as organic matter decomposition and soil enzyme activity, effect on human health such as irritation to skin, eyes and lung problems. Majority of farmers and extension personnel belonged to middle age group. 43.00 per cent of farmers possessed land between 10 to 20 acres, while 25.00 per cent of them had farming experience of more than 30 years. 45.00 per cent of extension personnel had job experience of 11-15 years.

A positive and significant relationship was observed between knowledge level and socio-psychological characteristics such education, extension contact, mass media use, achievement motivation, innovative. Proneness and scientific orientation.

Regarding suggestions to minimize ill –effects of agriculture chemicals, majority of farmers suggested the supply of quality grade pesticides in market, increases in use of bio-control agents, bio-fertilizers, bio-pesticides and resistant varieties while majority of extension personnel suggested strict use of chemicals as per recommended dose, use of integrated pest management and integrated nutrient management, while an equal important to disseminate information regarding ill effects of excessive use of chemicals.

Standardization of Nursery Techniques in *Terminalia tomentosa* Heyne Ex. Roth.

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ABSTRACT

Standardization of nursery techniques for production of healthy planting stock is one of the important aspects of nursery management. The present study was under taken on laurel to find suitable seed weight for germination, soil media and stump size for the production of good seedling within a reasonable time.

Seeds of different seed weight classes were sown in nursery to study the germination and growth the results indicated profound influence on germination, germination rate, vigour and seedling establishment. Seed weighing 1.0g-1.50g gave the highest germination percentage (65.80%) and seed weighing more than 2.0g attained maximum average height (42.36cm) as well as root length (28.22cm).

The rooting, sprouting, production of coppices and seedling establishment through one-year-old stumps showed high response to different soil media. Soil medium consisting of soil sand and FYM in proportion of 2:1:1 exhibited superior performance in terms of growth and establishment. Height, collar diameter and dry weight of seedlings were maximum (55.25cm 0.61 cm and 63.70 g respectively) in medium of soil, sand and FYM in the ration of 2:1:1 Application of ash hindered the growth of laurel at the seedling stage.

The use of one year old stumps consisting of 1-2 cm of collar diameter, 3 cm of shoot portion and 15 cm of root portion was found to be most ideal size of the root/shoot cutting in laurel as compared to usual size of the stump in practice (1-2 cm collar diameter, 2.5 cm of shoot and 10-12 cm of root). The stumps having 1-2 cm collar diameter, 3 cm shoot and 15 cm root showed significant increase in seedling height (19.29%) and drymatter production (22.74%) over the usual size of the stump. These stumps also had higher survival percent.

Vegetative Propagation in *Oxytenathera stocksii* (Munro)

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ABSTRACT

Oxytenathera stocksii is one of the most economically important bamboo due to its varied advantageous characters. Due to non-availability of fertile seeds, it is commonly reproduced by vegetative means. Recognizing the socioeconomic importance of the species and lack of effective vegetative propagation methods, the present investigations were carried out to identify the proper vegetative material growth regulators and congenial conditions.

The sprouting intensity, steeling establishment and biomass production through the imposing of coumarin (10ppm) showed higher response compared to rest of the treatments both in single and ten node cuttings. The percentage increase of seedling growth in respect of collar diameter, number of tillers, tiller height, seedling biomass and survival per cent over the control accounted for 65.38; 54.54, 81.80: 24.87, 46.44: 40.60, 80.80: 100 and 199.60; 132.60 respectively. However, number of roots and roots and root length increased by 170.73; 200 and 100;88.43 per cent by the application IBA (100 ppm) in both in the cuttings respectively. Among the conditions the cutting raised under open nursery situation was most ideal environment, which showed significant increase in collar diameter (5.80%) number of tiller per cuttings (28.11%), tiller height (3.32%) and seedling biomass (9.2%) over mist chamber conditions. Imposition of coumarin (10ppm) to single node cutting promoted the seedling growth. The percentage increase in seedling growth over control in respect of collar diameter tiller height, dry biomass was 46.79, 48.18 and 200.14 per cent respectively. However, the percent increase in number of roots and survival of seedlings over control in respect of collar diameter tiller height, drybiomass was 46.79, 48.18 and 200.14 per cent respectively. However, the present increase in number of roots and survival of seedlings over control in respect of collar diameter tiller height, drybiomass was 46.79, 48.18 and 200.14 per cent respectively. However, the per cent increase in number of roots and survival of seedlings over control was 195.61 and 78.27 respectively. The propagation through single node cuttings treated with coumarin (10 ppm) for 24 hr and raised under open conditions was found to be viable optimum for the production of healthy seedling stock and resulting in considerable reduction in time and cost of raising the seedlings.

Studies on the Effects of Drip and Surface Irrigation Methods on Cotton Under Saline Conditions

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ABSTRACT

An investigation was undertaken to study the effect of drip and surface irrigation methods (using saline ground water and canal water, respectively) for cotton under saline conditions with varying water table depths at Agricultural Research Station, Gangavati, Karnataka, during 2001-02. The results indicated that the drip irrigation at 1.2 ET recorded higher plant population, crop growth and yield parameters, which was superior over all other treatments. The maximum water saving (23.8%) was achieved in case of drip irrigation at 0.8 ET. However, the highest cotton yield (17.5 q/ha and 11.3 q/ha) was recorded in case of drip irrigation at 1.2 ET in both the blocks having deeper water table; lower soil salinity and shallow water table: higher soil salinity, respectively as compared to the other treatments in the same blocks.

The time weighted average soil salinity was more in case of shallow water table: higher salinity block compared to the other three blocks, which in turn resulted the lower kapas yield. Based on salt distribution studies, salt content in drip irrigation increased both in vertical and horizontal direction from trickle point and reached a maximum at the bottom and at the boundaries to the extent of 30 cm. Whereas in case of surface irrigation, salt content was increased up to 60 cm depth, beyond this the accumulation was not observed. The leaching studies revealed that two days once application of water through emitters was found better in leaching the salts than daily leaching up to 30 cm both in horizontal and vertical directions.

Economic feasibility studies indicated that the maximum gross income was obtained in case of drip irrigation at 1.2 ET (RS. 30747/ha.) even with saline water irrigation as compared to all other treatments. However, the higher B:C ratio was obtained in case of surface irrigation treatments owing to lower investment cost under deeper water table: lower soil salinity conditions. But, in case of shallow water table: higher salinity blocks, better, better B:C ratio was realized through drip irrigation.

Studies on Double Crosses Involving Potential Brinjal Hybrids

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ABSTRACT

Six brinjal (*Solanum melongena* L.) genotypes (Potential F_1 s) representing wider genetic base were selected and studies on potential double cross populations, potential single cross F_1 s for reciprocal recurrent selection, isolation economic segregants and heterosis and combining ability for growth and yield attributes were made through 6 x 6 diallel (excluding reciprocals) experiment.

Studies on double cross revealed that the DCF_1 S.C.H.N.2xS.C.H.N.5, S.C.H.N.1xS.C.H.N.4 and S.C.H.N.2 x S.C.H.N.4 were found to be potential heterotic hybrids. The major contributing factors for superiority for yield were weight of fruit in case of S.C.H.N.2 and S.C.H.N.5 and S.C.H.N.2 x S.C.H.N.4 and number of fruits per plant in S.C.H.N.1 x S.C.H.N.4. S.C.H.N.2 and S.C.H.N.2 x S.C.H.N.4 (parents) were found to possess moderate mean performance, high gca status in positive direction, higher GCA variance and lower SCA variance hence, it is suggested to exploit these 2 parents as potential parent populations to initiate the cycle of recurrent selection programme.

Present study has provided scope for isolation of economic sergeants. The double cross population S.C.H.N.2 x S.C.H.N.3 was identified as good population for selection of transgressive and economic sergeants. The R-1/2 x 3 (1-10), R-1/2 x6 (3-18) and R-1/2x3 (2-17) were selections made and suitable for development of pure lines after repeated selling.

The gca effects indicated that S.C.H.N.2 is can be used for genetic improvements of a crop with respect to yield per plant, mean fruit weight, length and diameter of fruit and plant height at final harvest. Similarly parent (S.C.H.N.4) for number of fruits per plant and days to flowering. The best double cross hybrids on the basis of sca effects were S.C.H.N.1 x S.C.H.N.3 (Yield/plant); S.C.H.N.1 x S.C.H.N.4 (No. of fruits per plant and days to first flowering; S.C.H.N.4 x S.C.H.N.6 (average fruit weight and S.C.H.N.2 x S.C.H.N.5 (fruit length).

Survey, Evaluation and Propagation of Charoli (*Buchanania lanzan* Spreng.)

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ABSTRACT

A survey was conducted to evaluate promising charoli strains in two thandas of Bidar talukas of Bidar district. Among 67 strains studied, 15 strains were tall staturred, 51 strains had round canopy, 41 strains are spreading habit and 55 strains had black colour. Among the different vegetative parameters studied, strain KRC-22 recorded longest leaf length (20.18 cm), while strain KRC-23 recorded maximum leaf breadth (21.36 cm) and petiole length (2.28 c.m).

The shape of the fruits was round in all the 67 strains and ripened fruits had reddish purple colour. The strain KRC-47 recorded longest fruit length (1.20 cm), fruit breadth (1.27 cm), fruit size (2.30 sq.cm), fruit weight (12.00g), fruit volume (8.00 ml) and pulp weight (5.00 g).

All 67 strains studied showed round shaped seeds and dull white colour seeds. The strain KRC-31 and KRC-40 recorded higher seed length (1.20 cm), seed breadth (0.70 cm), seed size (0.79 sq.cm), seed weight (8.45 g), weight of kernel (6.75 g) and seed volume (5.60 ml).

The strain KRC-13 recorded maximum TSS (29.00%), nitrogen (4.80%), protein (26.20%) and fat (57.00%). The characters leaf length, fruit yield, number of panicles, TSS, protein and fat had a coefficient of variation of more than 20 per cent.

Leaf length, fruit volume, pulp weight, seed weight, seed volume, seed size, weight of kernel, nitrogen, protein and fruit yield had positive significant correlation on kernel yield. The highest positive significant correlation on kernel yield. The highest positive direct effect was observed through fruit yield on kernel yield.

Strain KRC-53 (3.80) and KRC-26 (4.60) recorded higher overall acceptability for fruit characters and fruit juice, respectively.

Germination percentage was higher with *Glomus fasciculatum* and *Sclerocystis dussii* (94.43%) treated seeds. Highest graft-take was recorded in the strain KRC-14, KRC-26, KRC-46 and KRC-47 each recording 90 per cent.

Assessment of Brinjal Genotypes for Various Culinary Preparations

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ABSTRACT

Brinjal crop was raised at the vegetable section of golden Jubilee Block, Kumbapur Farm, University of Agricultural Sciences, Dharwad during early kharif 2002 to evolve criteria for breeders to develop variety /hybrid suitable for different culinary preparations, assessing the critical stage of harvest for different culinary preparations and organoleptic evaluation of these genotypes.

Evaluation of 13 different brinjal genotypes revealed considerable range of variation among themselves for all the characters. Maximum fruit length (11.64 cm) and fruit diameter (5.77 cm) was recorded in DBC-11BI and WCGR respectively. Genotype WCGR exhibited higher fruit weight (73.05g) and yield was maximum in DBC-133 AP (843.31 g/plant).

Dry matter content range from 7.11 (RRP) to 12.00% (DBC-134 KA) WCGR was identified as superior in total sugars (3.57%) and reducing sugar (2.77%) whereas no reducing sugar was found to be maximum in commercial check Kalpataru. Phenolic content was lowest (70.00mg/100g) in DBC-11BI and WCGR.

Cooking quality and organoleptic evaluation through overall acceptability of cooked preparation indicated that long purple striped DBC-134 KA as best suited for bhaji preparation because of taste and mouth feel. With respect of stage of harvest of fruits for bhaji preparation second stage of harvest (immature medium sized fruits of 9.25 cm length and 4.53 diameter is recommended.

For stuffing purpose, green round fruited WCGR genotype with creamy patches at styled end was preferred. The round shape enables the fruits to hold maximum amount of gravy stuffed in and ease the serving. Fruits harvested at second stage of maturity (6.67 cm length and 5.76 cm diameter) were highly preferred for the stuffing purpose.

Composite-I was best suited for bhartha preparation. The bigger size of fruit makes it convenient for easy roasting and faster peeling I a given time for given amount of bhartha. Among the three different maturity stages, third stage of harvest was highly acceptable because of higher among of TSS (6.20° Bricks), total sugars (3.67%) reducing sugars higher amount of phenols (83.42 mg.100g).

Studies on in Vitro Propagation of *Gerbera Jamesonii* B.

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ABSTRACT

An investigation on “Studies on in vitro propagation of *Gerbera jamesonii* B.” was carried out during 2000-20002 at the Tissue Culture Laboratory of Department of Horticulture, College of Agriculture, University of Agricultural Sciences, Dharwad.

In the present investigation five sub experiments were carried out by following CRD design in order to find out best explants, basal media, gelling agent, growth regulator and hardening media.

Regarding the suitability of explants, flower and bud were the best for culture establishment, by producing more number of adventitious shoots with early emergence of primordial. The MS medium emerged as the best media for in vitro shoot proliferation and subsequent growth. Among the gels used for standardization, sago at 50 g l⁻¹ + agar at 1 g l⁻¹ emerged as the sole replacement for agar, which gave best result in terms of shoot proliferation and subsequent growth. With respect to cost and quality sago at 50 g l⁻¹ was the best replacement for agar, which minimized the cost by four times. Among the cytokinins, BAP and kinetin at different concentrations, 2.5 mg l⁻¹ BAP + 0.1 mg l⁻¹ NAA produced more number of better sized shoots, Addition of kinetin in suppressed the proliferation of shoots which was more at higher concentration. On cytokinin free medium single shoot with maximum length were produced.

Among the auxins used in the rooting experiment, the maximum number of roots with better shoot and root characters were observed on 1.0- mg l⁻¹ NAA supplemented medium. IBA was found less effective than NAA, whereas rooting was not observed in medium with IAA because of its photo and thermo sensitive nature. Fertile medium gave highest survival percentage at 15 and 30 days after transfer to hardening media and plantlets so hardened were also more vigorous compared to those on peat and flyash + sand (1:1, v/v) media.

Effect of Postharvest Treatments on shelflife of Grape Cultivars Under Ambient and Cold Storage

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ABSTRACT

An investigation was carried-out in the laboratory of Department of Horticulture, college of Agriculture, University of Agricultural Sciences, Dharwad during 2001-02 to study the effect of post harvest treatments on shelflife 02 to study the effect of post harvest treatments on shelflife of grape cultivars under ambient and cold storage. Dip treatments of Benzyl adenine (100 ppm), Carbendazim (2000 ppm) and Benzyl adenine (100 ppm) + Carbendazim (2000 ppm) were imposed to grape bunches. Treated grapes were stored under ambient storage (at $26 \pm 2^{\circ}\text{C}$, 45-65% RH) and cold storage (at $3.5 \pm 0.5^{\circ}\text{C}$, 90% RH). The experiment was laid out in completely randomized design.

During the storage, among seedless cultivars, Arkavati recorded lower physiological losses in weight (PLW), least decay loss and minimum berry drop. In case of seeded cultivars, Bangalore Blue recorded the lowest PLW and decay loss. Appreciable reduction in PLW, Decay loss and Beery drop was observed by postharvest application of BA (100 ppm), Carbendazim (2000 ppm) and + Carbendazim (200 ppm) when compared to untreated bunches. Highest organoleptic qualities such as firmness, taste, flavour and overall acceptability were observed in Thompson Seedless. TSS and ascorbic acid content increased in most of the treatments. Titratable acidity of berries increased with increased in storage period, irrespective of cultivars and postharvest treatments. The lowest titratable acidity was observed with Araka Neelamani. Application of BA (100 ppm) + Carbendazim (200 ppm) recorded the lowest titatable acidity. Reducing, non-reducing and total sugar contents were increased with an advancement of storage. Thompson Seedless recorded the higher sugar contents followed by Arkavati. BA (100 ppm) as postharvest treatment resulted in minimum alteration of sugars. Treated grapes can be stored up to days in ambient storage and 35 days in cold storage without affecting the overall acceptability.

Heterosis and Combining Ability Studies in Bary Corn (Zea mays L.)

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ABSTRACT

The study was conducted to assess the magnitude of heterosis and combining ability in baby corn. A line x tester design was followed to obtain 30 single crossed by using 10 lines and 3 testers. Thirty crosses along with their parents and one commercial check were planted in simple RBD design in rabi 2001 at Agricultural Research Station, Arabhavi.

Results of heterosis indicated that the crosses Hyd. Sel-13-1 x CM 111, CMI 113 x CM-111 and NG-14 x CM-501 showed significant positive heterosis over better parent, mid parent and standard check (CoBC-1) for baby corn yield with husk and without husk. Heterosis over better parent was to the extent of 89.53 (Hyd. Sel-13-1 x CM-111) per cent for baby corn yield without husk. Significant positive heterosis over better parent and mid parent for number of cobs per plant was exhibited by the cross NG-14 x CM-501. Significant negative heterosis over better parent for husking percentage was exhibited by the cross NG-14 x CM-501. Significant negative heterosis over better parent for husking percentage was exhibited from the crosses KDMI-18 x KDMI-10, CML -113 x KDMI-19 and KDMI-18 x CM-501. The GCA variances was significant for all the characters for lines and it was significant for cob length and husking percentage in testers. The SCA variance was non-significant for all characters. This reveals the greater role of additive genetic variance.

From the present investigation CML-68(7) among lines and CM-111 among testers were found to be the better general combiners than the rest. KDMI-18 x KDMI-10 and NG-14 x CM-501 were found to be the 10 and NG-14 x CM-501 were found to be the best two crosses in their sca effect for baby corn yield without husk. Four crosses (CML-183-CB2-RMM-30-C-2-1B-13 x CM-111, CML-217 Tropical x CM-501 and CML -113 x KDMI -10) showed the negative significance sca effect for husking percentage. These crosses were from parents with low x high gca combination and hence, crop improvement could be done by hybridization followed by recurrent selection.

Genetic Variability Studies in Vegetable Mesta

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ABSTRACT

Studies on variability, correlation, path coefficient and genetic divergence were conducted on vegetable mesta at the Department of Horticulture, College of Agriculture, Dharwad. The analysis of variance indicated that there was considerable variation for all the characters studies in 26 vegetable mesta genotypes during kharif and summer season of 2002. High GCV with high heritability and genetic advance was observed for leaf area, number of leaves per plant, petiole length, internodal length, stem girth, fresh weight of leaf, fresh weight of stem, total green yield and dry weight of plant during both the seasons and also for the biochemical parameters like iron and protein content during summer season.

Correlation studies revealed that there was a strong positive association of leaf yield with number of leaves per plant, leaf width plant height, leaf length and leaf area during both the seasons. Path analysis revealed that leaf area was the single major character which exhibited highest positive effect on each of the dependent characters viz., plant height, leaf length, leaf width, number of leaves per plant, stem girth, fresh weight of stem, total green yield, leaf to stem ratio and total dry weight during both the seasons. All other independent characters had indirect contribution through leaf area.

Considerable amount of genetic diversity was noted in the material representing diverse ecogeographical origins. The 26 genotypes were grouped into five clusters. Cluster I was the largest comprising of 22 genotypes while, cluster II, III IV and V found solitary ones. The average intercluster D^2 value ranged from 59.15 (cluster I to IV) to 81.62 (Cluster IV to V). Cluster IV (HS-1) and Cluster V (GKK) with one Genotype where diverse from the rest of the cluster as evident from there high intercluster d^2 value (81.62). Cluster mena analysis revealed that the genotypes GKK and CKD-1 were found superior for important characters.

Genetic Variability Studies in Chilli (*Capsicum annum* L.)

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ABSTRACT

Field investigation with eighty chilli accessions was undertaken to click information on genetic variability, character association and path analysis at Department of Olericulture, Kittur Rani Channamma College of Horticulture, Arabhavi during 2001-2002.

Analysis of variance revealed highly significant ($P=0.01$) differences among treatments for twenty two out of twenty eight growth and yield characters in chilli. The values of genotypic and phenotypic co-efficient of variation were moderate for the characters like fruit set, fruits per plant, early, late and total fruit yield, fruit weight, fruit density chlorophyll-a, chlorophyll-b, fresh and dry red chilli yield, indicating the existence of little variability in the germless evaluated.

High heritability coupled with high genetic advance over mean were observed for plant height, plant spread, fruits per plant, late and total fruit yield, ten fruit weight, fruit density, fresh and dry red chilli yield indicating additive gene action fro these traits. Therefore, selection for these traits would be gainful. Correlation studies revealed significant and positive association of yield with territory branches, fruit length, fruit girth, fruit number, fruit set, early and late fruit yield, The red chilli yield had highly significant and positive association with plant height, tertiary branches and fresh red chilli yield, suggesting possibility of simultaneous selection for these traits.

Path analysis revealed that the direct selection on early and late fruit yield for total green chilli yield per plant, fresh red chilli yield and seed number per fruit for dry chilli yield would be gainful as they had direct effect. Per se performance revealed that PMR-5, Byadgi Kaddi, 9646, Anagi and 9639 were found promising for green chilli yield and PMR-5, 9639, 9646, VN3 and Agari for dry chilli yield. Pant C₁, PMR-5 Hissar Shakti and 9646 were also found resistant against thrips, mites aphids and fruit borer.

Processing of Banana Fruits

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ABSTRACT

The investigation entitled processing of banana fruits was carried out at the Kittur Rani Channamma College of Horticulture, Arabhavi, University of Agricultural Sciences, Dharwad during the year 2001-2002 with an objective to standardize the juice extraction technique and to study the suitability of different varieties of banana for preparation of banana figs.

The highest recovery of banana juice (84.86%) was obtained by treating the pulp with 6 g per kg of Pectinases-A enzyme for six hours with better quality parameters viz., TSS 20.50 per cent, non-reducing sugar 6.57 per cent, total sugar 14.47 per cent, pectin 0.598 per cent and non-enzymatic browning (OD values) 0.087. The organoleptic scores (out of 5) for juice were 4.13 for colour and appearance 3.94 for taste, 3.99 for flavour and 3.99 for overall acceptability.

The organoleptically acceptable good quality dehydrated banana figs were obtained from the variety Sakkarebale. The organoleptic (scores out of 5) were 4.03 for colour and appearance, 3.32 for taste, 3.33 for texture, 3.33 for flavour and 3.96 for overall acceptability. The recovery of dehydrated banana figs was 34.52 per cent with a dehydration ratio of 2.97. The time required for drying of banana figs was 25.25 hours.

Standardisation of processing Technology for Juice and Dehydrated Products of Ber Fruits

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ABSTRACT

An investigation to standardize the protocol for preparation of be juice, juice based beverages (RTS, squash, syrup) and dehydrated ber slices from ber fruits cv. Umran was carried out at the Department of Post-harvest Technology, Kittur Rani Channamma College of Horticulture, Arabhavi during the year 2001-2002.

Treatment of ber fruit pulp with pectinase B enzyme (4 g/kg pulp) gave 70 per cent juice yield as against 56 per cent in control. The quality of the juice obtained through enzyme treatment was found to be acceptable with higher organoleptic scores (3.67). The recovery of juice was higher (71%) in microorganisms-II treated pulp with the organoleptic scores of 3.15.

The RTS containing 14% ber juice + aonla juice + ginger + sugar adjusted to 15⁰ Brix + Spieces was acceptable with organoleptic scores (out of 5.0) of 3.14 for tasted, 3.17 for flavour and 3.14 for overall acceptability. The squash containing 30% ber juice + aonla juice + ginger + sugar adjusted to TSS of 50⁰ Brix was acceptable with organoleptic scores of 3.88 for colour and appearance, 3.63 for taste, 3.54 for flavour and 3.64 for overall acceptability,. The syrup containing 55% ber juice + aonla juice + ginger +TSS adjusted to 68⁰ Brix was acceptable with organoleptic scores of 3.61 for flavour.

For obtaining good quality dehydrated be fruit slices, stepping in 70⁰ Brix sugar syrup for 15 hours and drying in an electric drier was found to be best with an organoleptic scores of 3.20 for overall acceptability with minimum time for dehydration (24.73 hours) lowest final moisture content (5.62%) and highest total sugars (16.95%) But highest recovery of dehydrated slices (27.84%) and minimum dehydration ratio (3.60) were observed in treatment of sliding + steeping in 50⁰ Brix sugar syrup for 15 hours.

Thiocyanate Content in Foods and Effect of Processing

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ABSTRACT

An investigation was undertaken with an objective to estimate the thiocyanate content of foods commonly consumed in Northern Karnataka and to assess the impact of domestic processing. The analysis of thiocyanate was carried out by the method of Basu et al. (1986).

Among the foods analyzed, highest thiocyanate was observed in drumstick (57.53 mg/100 g fresh tissue) followed by mustard (21.39 mg/100 g) and lowest in papaya (0.04 mg/100 g fresh tissue) and curry leaves (0.07 mg/100 g fresh tissue). The thiocyanate in leafy vegetables ranged from 0.07 to 7.90 mg/100 g fresh tissue with lowest in curry leaves and highest in cabbage and in other vegetables ranged from 0.14 to 57.53 mg/100 fresh tissue with lowest in little gourd and highest in drumstick. The thiocyanate in roots and tubers ranged from 0.15 to 2.57 mg/100 g fresh tissue with lowest in carrot and highest in colocasia and I fruit ranged from 0.04 to 1.79 mg/100g fresh tissue with lowest in papaya and highest in jack fruit and in nuts and oilseeds ranged from 0.18 to 21.39 mg/100 g with lowest in coconut and highest in mustard. The thiocyanate in condiments and species ranged from 0.47 to 6.98 mg/100 g with lowest in red chilli powered and highest in garden cress. The thiocyanate in milk and milk products was very low and it ranged from 0.21 to 0.23 mg/100 ml. The per cent reduction of thiocyanate due to cutting, ranged from 6.45 to 58.22 per cent in vegetables and fruits and due to boiling, stewing vegetables ranged from 34.43 to 95.64 and 54.41 to 93.36 per cent, respectively which was significant. The thiocyanata reduction in mustard, ladies finger and onion after splattering, roasting and frying was 34.13.57.14 and 80.92 per cent, respectively.

Exploration and Documentation of Indigenous Hypoglycemic Substances of North-Karnataka and Impact of Periwinkle Leaves (*Catharanthus roseus*) on Management of Diabetes Mellitus

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ABSTRACT

An investigation was undertaken with an objective to document and study the consumption pattern of indigenous hypoglycemic substances by diabetics of North Karnataka region and to investigate the impact of commonly available indigenous plant material for management of diabetes mellitus.

Five zones viz., dry, coastal, hilly, transitional and North Eastern transitional zones were selected randomly from North Karnataka region for documentation study with 30 type-2 diabetics in each zone. About 20 indigenous hypoglycemic substances were documented in North Karnataka. All the substances were of plant origin, which included herbs (n=10), green leafy vegetables (n=2), other vegetables (n=3), fruits (n=3) and species (n=2). These substances were consumed by the diabetics in the form of dry, fresh, decoction and juices. Majority of the diabetics in North Karnataka were more aware and used fenugreek seeds, bitter gourd, bael leaves, jumbu seeds and tulasi leaves for the control of diabetes. Most of them observed good control over the disorder and perceived no side effects on consuming the indigenous hypoglycemic substances.

Bases on the documentation data, easily and abundantly available periwinkle leaves of 'pink flowering plant (*Catharanthus roseus*) selected for intervention. About 20 type-2 diabetics residing in Dharwad city were selected, of which ten were taken as experimental and rest as control group. Periwinkle leaves powder (2g/day) was given to the experimental group for a period of one months and no supplementation was given to the control group. There was a significant reduction observed in fasting blood glucose (range, 3.76-9.83%), post paramedical blood glucose (6.69-12.36%), total cholesterol (1.251.99%), LDL-C (1.06-3.07%) and triglyceride levels (0.79-4.03%) of diabetics in experimental group. On the other hand no marked reduction was observed in blood glucose and blood lipid levels of the diabetics in control group.

Impact of Fats and Oils Consumption on Lipid Profile of Adults Belonging to Varied Income Strata

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ABSTRACT

An investigation was undertaken to know the impact of fats and oils consumption on lipid profile of adults belonging to varied income strata during 2001-2002.

Total of 120 adults in the age range of 35-55 years were selected from urban area of Dharwad taluk. Nutritional status was assessed by Nutritional anthropometry and diet survey. Lipid profile of selected 30 sub samples were analysed using span diagnostic kits.

Results revealed that the quantity of oil consumed per month by HIG (5 kg/mo) family was more. Maximum per cent of LIG (62.5%) and MIG (45%) families were using groundnut oil whereas, HIG families were using sunflower oil (45%). The mean intake of visible and invisible fat of HIG adults. (47.67 g/and 20.3g/d) was more followed by MIG (37.65g/d and 18.63g/d) and LIG adults (21.83g/d and 11.16g/d). The mean intake of total fat, cholesterol, SFA, MUFA and PUFA was maximum for HIG adults. The ratio of SFA; MUFA : PUFA and $n_6:n_3$ was favourable only in case of LIG adults. Anthropometric measurements like weight, height waist and hip circumference of HIG adults was maximum compared to LIG and MIG adults. Serum lipid profile revealed that the mean TC (228.8 mg/dl), LDL-C (159 mg/dl), VLDL-C ((37.8mg/dl), triglyceride (189.4 mg/dl) were maximum for HIG adults and levels were minimum for LIG adults (7.6 and 5.3) followed by MIG adults (5.4 and 3.1) and it was lowest for LIG adults (3.4 and 1.9). The mean level of good cholesterol was maximum for LIG adults only. Adults consuming groundnut oil had registered the desirable and lowest values for TC, LDL-C, VLDL-C, triglyceride, TC/HDL and LDL/HDL. Minimum and desirable lipid levels were observed for the adults who consumed less than 25g of oil/day.

Study on the local immunity of uterus against administration of exapar® in post partum cows

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ABSTRACT

Expand ® a herbal uterine cleanser manufactured by Dabur Ayurved, New Delhi, is used routinely in the field animals for expulsion of retained foetal membranes. A study was made on the local immunity of uterus after administration of Exapar®.

A total of 18 advanced pregnant cows from in and around Bidar, were selected and grouped into treatment (12 cows) and control (6 cows). Cows in the treatment group were administered Exapar® on the day of calving at dose of 100 ml bid on first day and 50 ml bid on 2nd day and continued till 5th day, while the postpartum cows in the control group were left untreated. Samples comprising of serum, whole blood and Lochial discharges were collected from all the animals on day 0, 6th, 15th, and 21st, after calving. The samples were subjected to various immunological techniques both for non specific and immunity. Phagocytic index through Nitroblue tetrazolium (NBT) reduction assay, total leucocyte count (TCL), differential leucocyte count (DLC) were conducted using anti Ig A antibodies prepared in the laboratory.

There was a significant ($P \leq 0.05$) increase in NBT values in the treatment group from zero day to third week and the TLC values in treatment group remained same from zero day to 2nd week while significant increase was observed in the third week. Sodium dodecyl sulphate-polyacrylamide gel electrophoresis (SDS-PAGE) conducted to observe different protein bands both in treatment and control groups have given significant increase in number of protein bands in treatment group. To conclude, Exapar® has definite effect on local immunity in post partum cows in boosting non-specific immunity.