

PHYSIOLOGICAL BASIS OF PRODUCTIVITY IN LITTLE MILLET (*Panicum miligae*)

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ABSTRACT

Field experiments were conducted at the University of Agriculture Sciences, Dharwad during *kharif* 2000 and 2001 to find out the physiological basis of productivity in little millet. Experiments were laid out in randomised block design with three replications on medium black soil under rainfed conditions. During *kharif*, 2000, 28 genotypes were screened for various morphological, growth, phenological, yield and yield components. On the basis of results of first season experiment, four genotypes each in low, medium and high yielding group along with local check were subjected for detailed analysis of physiological, biophysical, biochemical, nutritional and quality parameters. It was observed that the crop performance was better during *kharif*, 2000 as compared to *kharif*, 2001 owing to better rainfall, but the behaviour of genotypes did not change between the two years.

Genotypes TNAU-63, TNAU-89 and OLM-20 recorded significantly higher grain yield and these genotypes had more number of tillers and green leaves per plant, higher LA, leaf, stem, earhead and total dry matter. Among growth parameters, LAI, LAD, CGR, SLW and BMD were found to have significant positive correlation with grain yield. The high yielding genotypes possessed higher stomatal frequency (abaxial), veinload frequency, photosynthetic rate, total chlorophyll content, NRA and stomatal conductance and moderate transpiration rate.

Higher contents of crude protein, moisture and ash coupled with low fat, crude fibre and carbohydrates. They also had higher grain yield, panicle length, grain number per plant, 1000-grain weight and grain productivity. Results thus revealed that for higher productivity in little millet, such traits can be incorporated successfully in breeding for an ideal plant type.

STUDIES ON GENETIC TRANSFORMATION IN COTTON (*Capsicum hirsutum* L.)

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ABSTRACT

An investigation was carried out to obtain bollworm resistant transgenic cotton plants through both in vitro and in planta Agrobacterium mediated transformation protocols. Use of pre cultured shoots in the in vitro transformation method was done to ensure activation of cell division in the apical meristematic tissues and it was found to be optimum at 48 hours. Attempts to standardize co-cultivation duration resistant shoots Co-cultivation beyond this period resulted in softening, browning and death of the explants. A low titer of bacteris (0.5×10^8 cell/ml) was found to be important for co-cultivation, while the high titers resulted in overgrowth of Agrobacterium on explant tissues. Acetosyringone, a phenolic compound know to induce virulence of Agrobacterium was found to be effective @ 200mM, beyond which it was bacteriostatic.

Studies on pollen tube pathway mediated (PTP) transformation revealed that, out of 5619 flowers, where the stigmatic surface was treated with five percent sucrose along with twenty mg/ l boric acid prior to application of Agrobacterium and pollination, resulted in a boll set of 32.5 percent. From such pollinated plants, 22,861 seeds were harvested. Out of these, only 1199 seeds germinated. All these 1199 seedlings were further subjected to stringent In solium kanamycin screening in the transgenic greenhouse. From the gene integration studies, it was clear that, only seven plants were PCR positive and hence the transformation frequency was 0.3062 per cent. It is necessary to futher optimize the factors influencing the efficiency of transformation in vitro. Current investigation on PTP transformation methods with no tissue culture approaches have been efficient alternate methodgies available for cotton transformation.

**GEOGRAPHIC VARIATION IN MORPHOMETRY, GENETICS AND INSECTICIDE
RESISTANCE IN COTTON BOLLWORM, *Helicoverpa armigera* (Hubner)
POPULATIONS OCCURRING IN SOUTH INDIAN COTTON ECOSYSTEMS AND
VALIDATION OF IPM AND IRM MODULES**

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ABSTRACT

Phenotyping for various morphometric traits at larval, pupal and adult stages of *Helicoverpa armigera* (Hubner) revealed significant variation between the populations from twelve different geographic locations of south Indian cotton ecosystem. Study on the relationship between larval resistance to different insecticides and morphometry of *H.armigera* population revealed positive and significant relationship in most of the cases with some exceptions. Insecticide bioassay of F₁ generations for most widely used conventional insecticides clearly indicated that resistance to synthetic pyrethroid (cypermethrin) is prevalent in all most all the study locations highest being in Raichur of Karnataka and Guntur of Andhra Pradesh. Overall populations from northern part of south India comprising Andhra Pradesh and Maharashtra and Raichur of Karnataka found to possess significantly higher phenotypic attributes for all the quantitative morphometric traits and higher level of insecticide resistance than those from Southern states (Tamil Nadu and part of Karnataka). Genetic similarities among geographical populations from the mitochondrial marker data were within the similarity coefficients ranging from 0.13 to 0.52, indicating high level of genetic differences between populations. On the basis of simple matching coefficients all the selected populations were grouped into 4 clusters. Cluster 2 is having maximum of five populations followed by cluster 1 with four populations, cluster 4 with two and cluster 3 with single population. None of the populations compared to one another beyond a similarity coefficient equivalent to 0.52. Field validation of IPM and R-IPM modules based on genetic diversity at Maradagi village, yielded maximum yield of 16.00 q ha⁻¹ from IPM module at Maradagi village followed by 13.80 q ha⁻¹ in R-IPM module. On the contrary, farmers check plot recorded a lowest seed cotton yield of 11.15 q ha⁻¹. IRM module at Ekhaspur village of Raichur recorded a highest seed cotton yield of 15.30 q ha⁻¹ compared to 10.88 q ha⁻¹ in farmers check plot.

INFLUENCE OF N-SUBSTITUTION LEVELS THROUGH ORGANIC AND INORGANIC SOURCES ON GROWTH, YIELD AND POST HARVEST QUALITY OF CAPSICUM UNDER PROTECTED CONDITION

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ABSTRACT

The investigation was planned and executed in the Department of Horticulture, Main Agricultural Research Station, University of Agricultural Sciences, Dharwad during the year 2002-03 and 2003-04, to study the influence of growing environmental conditions and sources of nutrients on growth, yield and post harvest quality parameters of capsicum under different storage conditions. The experiment was laid out in split plot design with three replications.

The treatments comprised of three growing environments *viz.*, low cost polyhouse, medium cost poly house and net house condition and eight levels of nutrient sources were evaluated.

The higher air temperature of 23.74 to 33.98°C, GDD of 489.18 (°cd), optimum RH of 68.14 to 76.49 (%) and higher light intensity of 1157.38 to 1648.54 (ft. cd) prevailed in medium cost polyhouse resulted in higher growth, yield and quality parameters.

Maximum capsicum yield of 37.77 t ha⁻¹ was recorded in medium cost polyhouse irrespective of treatments imposed which was followed by low cost polyhouse and net house (36.69 and 24.49 t/ha, respectively). The favourable environmental conditions prevailed in medium cost polyhouse might have helped in better growth of roots and shoots which directly helped in better vegetative growth, yield attributing parameters and vis-à-vis highest total yield 37.77 t ha⁻¹).

Among the sources of nutrients, the treatments involving 100 per cent RDN through poultry manure (PM) + *Azospirillum* resulted in significant increase in yield components *viz.*, number of fruits / plant (10.29), fruit weight / plant (1.02 kg), number of seeds / fruit (158.37), seed weight / fruit (1.47 g), higher pericarp weight / ten fruits (751.33 g).

The interaction effects due to growing environments and nutrient sources showed that plants grown under medium cost polyhouse + 100 per cent RDN (PM + *Azospirillum*) recorded higher growth and yield parameters with highest net returns of Rs. 4,86,088.63 / ha and gross returns of Rs. 6,49,950.00 /ha. However, interaction effect due to low cost polyhouse recorded highest B:C ratio of 3.43, which is mainly due to minimum cost of cultivation.

Capsicum fruits stored under cold storage slowed down all the biochemical processes leading to delayed ripening, thus increasing the shelf life over a period of 32 days of storage.

NUTRITIONAL AND MICROBIAL QUALITY OF STREET FOODS AND DEVELOPMENT OF EDUCATIONAL MODULE FOR FOOD HANDLERS

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ABSTRACT

Street foods with substantial amounts of nutrient contribution, are subject to deteriorate in the quality by microbial contamination due to unhygienic handling of food. Hence, the present investigation on nutritional and microbial quality of street foods and development of educational module for food handlers was carried out in Dharwad city. The market survey revealed that different types of popular street foods vended in thickly populated areas varied in cost and serving size. The consumers preferred these foods due to convenience, variety, better taste, low cost and freshness. The hygienic practices adopted by vendors especially personal and environmental were far from satisfactory. The nutrient contribution of street foods varied depending upon the cost, serving size and composition. The per serving of sweet items supplied more energy followed by non-vegetarian foods and least from fast foods. The protein and fat content of non-vegetarian foods was more followed by fried foods, while cereal foods supplied the least. The carbohydrate content of sweet items was more followed by fried foods and lowest from non-vegetarian foods. The fried and fast foods supplied more fibre and non-vegetarian and sweet items supplied less fibre in the group.

The per rupee availability of energy was highest from sweet items followed by fried and cereal foods. While lowest from fast foods. The protein and fat content of fried foods was more. The carbohydrate content of sweet items and fibre of cereal foods found to be on higher side. The procedural protocol of street foods revealed several health hazards from processing techniques, raw materials, handling practices, environmental sanitation, working place and equipment used among different vendors. The microbial quality revealed that the total bacterial and coliform counts were on the higher risk level. The HACCP analysis indicated critical points in egg fried rice in raw materials, handling and serving. The developed educational module on, personal and environmental hygiene for food handlers was effective in reducing several risk hazards.

UTILIZATION OF NATURALLY COLOUR LINTED COTTON YARNS IN THE HANDLOOM SECTOR TO PRODUCE UNION FABRICS

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ABSTRACT

The present study was carried out during the years the objectives, to know the effect of kier boiling on naturally colour linted cotton yarns, to explore the possibility of utilizing naturally colour linted cottons as weft with white cotton, viscose rayon, *P/C* and filature silks to produce union fabrics on handloom, to assess the performance of newly designed handloom union fabrics by physical testing and Kawabata system, to evaluate the tactile properties and to workout the cost of production of variegated union fabrics. In total six control samples (WC, VR, *P/C*, Muga, Mulberry, Tasar), twelve corresponding union fabrics were constructed on pitloom. The results revealed that, kier boiling with caustic soda enhanced count, tenacity of DDCC-I, DBH-250 yarns. All control samples were woven with greater ends than picks per inch, exhibited higher weft way crease recovery, lower bending length in both directions. However, warp way, weft way tensile strength of control samples was higher than their corresponding union fabrics except Muga, Tasar. On the other hand, union fabrics showed greater warp tear strength with slight pilling. White cotton, Viscose rayon, *P/C* samples showed higher resistance to abrasion, silk samples lower compared to their corresponding union fabrics. The drape *co-efficient* was *least in MUD₁, WCD₁ fabrics*. From Kawabata evaluation system it was found that, union fabrics had higher tensile (except linearity of stress strain curve and tensile resiliency), bending, shear, compressional (except compressional resiliency), surface properties. However, total hand values for women's winter thin dress was excellent for Tasar, PC, VRD1, MBD1 fabrics. Most of respondents opined that union fabrics were fibrous, dull, coarser, rough in appearance, crisp, stiff in hand, close, heavy, firm, flat in texture. In general, majority of respondents preferred union fabrics. The cost of production of union fabrics was lower compared to their respective control fabrics.

EFFECT OF SPLIT APPLICATION OF NITROGEN AND POTASSIUM ON GROWTH, YIELD AND QUALITY OF RED CHILLI UNDER DRIP IRRIGATION SYSTEM

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ABSTRACT

A field experiment was carried out at Main Agricultural Research Station, Dharwad, University of Agricultural Sciences, Karnataka during 2003-04 to study the response of split application of nitrogen and potassium in red chilli under drip irrigation system. The experiment was laid out in Randomized Block Design replicated thrice in black soil.

Irrigation through drip method recorded (2097 kg/ha) 30 per cent higher fruit yield than furrow method in chilli (1612 kg/ha). Application of N + K with 12 (3094 kg/ha) and 9 splits (2847 kg/ha) increased the fruit yield by 44 and 46 per cent with an additional income of Rs. 48890 and Rs. 36780 per ha, respectively over drip with 100% RDF without split (2097 kg/ha). The growth and yield components and N, P, K uptake at harvest increased significantly with 12 split application of N and K. The weight of discoloured fruit reduced significantly due to the 12 split application of N and K. The per cent oleoresin (16.10%) and oleoresin yield (183 kg/ha) increased with 12 split application of N and K.

Fertilizer use efficiency was found significantly higher in drip method (7.62) compared to surface method of irrigation (5.65). The fertilizer use efficiency was increased by 46 and 26 per cent with 12 and 9 split application of N + K compared to drip without split (7.62).

Water use efficiency was found significantly higher in drip method (46.18 kg/ha-cm) compared to surface method of irrigation (25.75 kg/ha -cm). Water use efficiency increased by 47 and 36 per cent with 12 and 9 split application of N + K, respectively compared to drip with 100% RDF.

RESPONSE OF *KHARIF* GROUNDNUT (*Arachis hypogaea* L.) TO PLANTING PATTERNS AND ROW APPLICATION OF ORGANICS

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ABSTRACT

A field experiment was conducted at Main Agricultural Research Station, University of Agricultural Sciences, Dharwad during *kharif*, 2004 to evaluate the response of *kharif* groundnut (*Arachis hypogaea* L.) to planting patterns and row application of organics. The experiment consisted of nine treatment combinations consisting of three planting patterns and two organics (vermicompost, farmyard manure) and no organics (control).

Planting patterns showed significant differences with respect to morphological characters. Paired furrow planting produced significantly taller plants more number of branches plant⁻¹. Partitioning of dry matter in reproductive parts was also more in paired furrow planting of groundnut as compared to paired row planting and normal planting. Paired furrow planting of groundnut produced significantly higher dry pod yield (4323 kg ha⁻¹) and kernel yield (3243 kg ha⁻¹) over other planting patterns. The yield components such as total number of pods plant⁻¹, dry pod weight plant⁻¹, shelling percentage and harvest index were higher in paired furrow planting. Paired furrow planting also recorded significantly higher soil moisture content over other planting patterns.

The performance of individual plants with respect to morphological parameters, growth and yield parameters were superior with row application of vermicompost. Pod yield (4280 kg ha⁻¹), kernel yield (3203 kg ha⁻¹) and quality parameters were higher in row application of vermicompost as compared to farmyard manure and no organics (control).

Pod yield, kernel yield and oil yield (4661, 3574 and 1739 kg ha⁻¹ respectively) were higher in paired furrow planting with row application of vermicompost as compared to other treatment combinations.

Paired furrow planting with row application of farmyard manure recorded higher net returns (Rs.39098 ha⁻¹) and B:C ratio (3.44) compared to other treatment combinations.

INTEGRATED WEED MANAGEMENT IN TRANSPLANTED ONION (*Allium cepa* L.) UNDER IRRIGATED ALFISOL

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ABSTRACT

A field experiment was conducted at farmer's field of Mogalahally village, Molokalmuru taluk, Chitradurga district during *kharif* 2004 to study the integrated weed management practices in transplanted onion, under irrigated alfisol. There were thirteen treatments with three replications laid out in randomized block design.

Among the weed control treatments, oxadiargyl @ 90 g a.i. ha⁻¹ (PE) + oxyfluorfen @ 0.25 kg a.i. ha⁻¹ (POE) at 40 DAT and oxadiargyl @ 90 g a.i. ha⁻¹ (PE) + hand weeding at 40 and 60 DAT were recorded significantly highest weed control efficiency (95.22% and 94.29%), higher bulb yield (25.67 t ha⁻¹ and 23.60 t ha⁻¹) and lowest weed index values (7.68% and 14.62%) respectively next to the weed free check compared to farmers practice (three HW) and unweeded control.

The morpho-physiological traits *viz.*, leaf dry weight, bulb dry weight, total dry weight were lowest in unweeded control and the application of oxadiargyl @ 90 g a.i. ha⁻¹ (PE) + oxyfluorfen @ 0.25 kg a.i. ha⁻¹ (POE) at 40 DAT and oxadiargyl @ 90 g a.i. ha⁻¹ (PE) + hand weeding at 40 and 60 DAT were increased these parameters significantly compared to farmers practice (three HW) and unweeded control. All the quality parameters, *viz.*, total soluble solids, sprouting (%) and rotting (%) did not differ significantly among the treatments except unweeded control which had significantly lower percentage of rotting.

Among the different integrated weed management practices the net returns (Rs.73466 and 66661 ha⁻¹) and B:C ratio (3.22 and 3.05) were significantly higher with the application of oxadiargyl @ 90 g a.i. ha⁻¹ (PE) + oxyfluorfen @ 0.25 kg a.i. ha⁻¹ (POE) at 40 DAT and oxadiargyl @ 90 g a.i. ha⁻¹ (PE) + hand weeding at 40 and 60 DAT respectively compared to other treatments.

INFLUENCE OF PLANT GROWTH REGULATORS AND NUTRIENTS ON PRODUCTIVITY POTENTIAL IN SESAMUM (SESAMUM INDICUM L.)

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A field experiment was conducted to find out the effect of different growth regulators during kharif 2002 at Main agricultural Research Station, University of Agricultural Sciences, Dharwad. The experiment was laid out in a factorial randomized block design with two genotypes and eight treatments. Growth regulators and nutrients significantly increased the plant height but decreased with lihocin and mepiquat chloride as compared to control. Number of capsules increased significantly under the influence of growth regulators and nutrients. Days to 50 per cent flowering was earlier due to growth regulators in both genotypes. The dry matter accumulation in leaf, stem, reproductive parts and total dry matter significantly increased due to the application of plant growth regulators and nutrients. The data on AGR, RGR, CGR, LAI, LAD, SLW, NAR significantly increased due to growth regulators and nutrients. The biochemical parameters viz., chlorophyll 'a', 'b' and total chlorophyll and NRA activity was significantly higher in the treatments with plant growth regulators and nutrients. The important yield parameters viz., seed yield per plant, 1000-seed weight and number of seeds per capsule increased significantly due to growth regulators and nutrients. Among them, lihocin (0.5 ml/lit) was found very effective. The yield potential in variety DS⁻¹ significantly was more compared to E-8. The data on correlation coefficients between important yield and physiological, growth parameters indicated that seed yield possessed a significant positive correlation with NRA, chlorophyll content, NAR, CGR, RGR, AGR, LAD and leaf area. The present study revealed that among various treatments the benefit:cost ratio highest with lihocin @ 0.5 ml per lit followed by planofix @20 ppm and mepiquat chloride @1 ml per lit. This indicates that the application of lihocin is more effective and economical with higher benefit:cost ratio in sesamum.

INFLUENCE OF SALICYLIC ACID AND NUTRIENTS ON PHYSIOLOGY OF DISEASE RESISTANCE IN GROUNDNUT (*Arachis hypogaea* L.)

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ABSTRACT

A field experiment was conducted during *kharif*, 2004 at Agricultural College Farm, University of Agricultural Sciences, Dharwad to study the influence of salicylic acid and nutrients on the incidence of late leaf spot and on various morphological, physiological, biochemical, yield and yield components in groundnut. Experiment consisted of fifteen treatments viz., salicylic acid (400, 600, 800 and 1000 ppm) alone and in combination with nutrients (magnesite, FeS₀₄, ZnS₀₄ and CUS₀₄) laid out in randomized block design with three replications.

The results revealed that the application of salicylic acid (600 ppm) + magnesite (250 kg/ha) recorded lower incidence of late leafspot and also recorded maximum plant height, leaf area, number of pods and total dry weight (leaf, stem and reproductive parts). This treatment also had higher values for absolute growth rate, crop growth rate, leaf area index, leaf area ratio, leaf area duration and biomass duration compared to other treatments.

The yield and yield components (shelling per cent, number of pods, harvest index and test weight) increased significantly with the application of lower concentration of salicylic acid either alone or in combination with nutrients. Among them, the maximum values were obtained with salicylic acid (600 ppm) + magnesite (250 kglha) followed by salicylic acid (400 ppm) + magnesite (250 kglha) over all other treatments. The total chlorophyll content increased significantly due to the application of salicylic acid either alone or in combination with nutrients, salicylic acid (600 ppm) + magnesite (250 kglha) recorded significantly higher chlorophyll (a, b and total) content over other treatments. Salicylic acid (1000 ppm) + magnesite (250 kglha) recorded the maximum phenol and tannin contents and lower sugar content over all other treatments.

INFLUENCE OF PLANT GROWTH REGULATORS ON GROWTH, PHYSIOLOGY AND YIELD IN POTATO (*SOLANUM TUBEROSUM* L.)

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ABSTRACT

A field experiment was conducted during *kharif*, 2004 at Agricultural College, University of Agricultural Sciences, Dharwad to know the effect of growth regulators viz., miraculan (0.125, 0.25, 0.5 and 1.0 g a.i./ha), vipul (0.25 g a.i./ha), NAA (50 ppm), cytozyme (1000 and 2000 ppm), ethylene (100 ppm) and salicylic acid (200 and 400 ppm) on various morphological, physiological, biochemical, growth and yield parameters in potato. An attempt was also made to study the compatibility and phytotoxicity effect of these chemicals. The treatments were laid out in randomized block design with three replications and imposed at 30 and 45 days after sowing.

Results revealed that growth regulators significantly increased the plant height (except with ethylene) and number of branches. The growth regulator treatments significantly increased the dry weights of leaf, stem, tuber and total dry weight and the maximum was observed with NAA (40 ppm) followed by miraculan (1.0 g a.i./ha). The growth parameters viz., leaf area, leaf area index, leaf area duration, crop growth rate, absolute growth rate, net assimilation rate, relative growth rate, specific leaf weight and biomass duration increased significantly due to growth regulators.

Yield and yield attributing characters increased significantly with growth regulators with NAA (40 ppm) recording significantly higher values. There was a significant increase in chlorophyll (a, b and total) content and NRA due to growth regulators and were maximum in NAA (40 ppm) followed by miraculan (1.0 g a.i./ha). TSS and ascorbic acid content increased with an increase in the concentration of plant growth regulators. Maximum TSS was noticed in miraculan (1.0 g a.i./ha) and ascorbic acid content was maximum with NAA (40 ppm). No phytotoxicity symptoms were observed in any of the treatments and it was found compatible to mix plant growth regulators either with a fungicide or an insecticide.

EVALUATION OF BOLD SEEDED GROUNDNUTS FOR CONFECTIONERY CHARACTERISTICS

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ABSTRACT

Bold seeded groundnut varieties a for manufacturing confectionary products and export of hand picked selection grade kernels. Aflatoxin and pesticide residues are limiting the export potential necessitating development of varieties with inbuilt resistance to pest and diseases.

Evaluation of 49 large seeded groundnut genotypes over two seasons revealed significant genotypic variation for productivity, physical, chemical and sensory traits besides resistance to late leaf spot. Significant season and genotype x season interaction were also evident for most of the traits. Genetic advance was low (2-5) for productivity traits due to low heritability (7- 22%). Heritability was low (14%) to moderate (42%) for physical traits with moderate to higher genetic advance for seed variation index (13) and large kernel percent (21). Heritability was high (78-95) for all the chemical traits and genetic advance was low (5) for oil due to less variation and high (23-38) for other traits. The association of pod yield with test weight was negative in rainy but positive in post-rainy season. No association existed between seed mass and chemical traits. Association was negative for oil content with protein, carbohydrate and sugars. Late leaf spot had negative association with oil content and shelling percentage but positive with sugar content.

The genotypes TG 41, DCG 36, DCG 31 and M 110-14 were superior for productivity. Among them, M 110-14 was resistant to LLS and DCG 36 was resistant to *Spodoptera* and late leaf spot besides possessing good sensory traits. The genotypes TG 19, DCG 27, TG 40 and TGLPS-7 combined good physical traits with high yield. The genotypes DCG 211 DCG 24, DCG 26 and TKG 19-A were superior for chemical traits with low oil and high protein and sugars. The entries, Somnath, M 28-2 and DCG 17 combined high yield with superiority for seed uniformity and sensory traits. M 28-2 was resistant to late leaf spot and *Spodoptera*. DCG 17 was resistant to late leaf spot and rust and recorded high shelling outturn.

MORPHOLOGICAL AND MOLECULAR DIVERSITY IN SPECIALITY RICE (*Oryza sativa* L.) GENOTYPES

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ABSTRACT

An investigation was carried out during Kharif 2002 at Agricultural Research Station (paddy) Sirsi to assess genetic diversity in terms of morphological, physico-chemical and molecular features among specialty rice genotypes.

Significant variability was observed for all the 11 morphological traits and 5 physico-chemical traits. High *pev* and *Gev* were observed for straw yield, days to flowering, grain yield, and grains per panicle, volume and percent popping. High heritability was recorded by days to flowering, plant height, and number of grains per panicle, kernel length, popping features and amylose. Positive genotypic correlations were observed for grain yield with days to flowering, plant height and straw yield. Strong negative associations were evident for amylose with popping features.

Days to flowering, grains per panicle and kernel length contributed greatly towards divergence among morphological features whereas popping features and amylose contributed 93.18 per cent among the physico-chemical features.

Morphological diversity in the genotypes could classify the 23 genotypes in to 6 clusters with cluster I being largest whereas physicochemical features grouped them in to five clusters with cluster I having 10 genotypes.

Molecular profiling of 23 genotypes using 20 SSR markers classified them in to six clusters. Polymorphic information content (PIC) ranged from 0.287 to 0.891 across the markers. Kari bhatta and Medhini Sanna bhatta were most divergent (10 per cent similarity) while Kempu hasadi and Kempu jadda bhatta were highly related with 61 per cent similarity. Out of 23 specialty rice genotypes, 12 genotypes could be fingerprinted with 9 SSR markers. Out of 12 genotypes, fingerprinted 10 could amplify a unique amplicon with a single marker. However, Dodda honasu and IR-57773 could amplify a unique amplicon with two SSR markers.

Morphological, physico-chemical and molecular information generated similar diversity patterns. Information generated on specialty rice genotypes is eminently suitable for proprietary purpose besides its use in the genetic enhancement of native rice.

STUDIES ON INTEGRATED NUTRIENT MANAGEMENT ON SEED YIELD AND QUALITY OF MOTHBEAN [*Vigna aconitifolia* (Jacq) Marchel]

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ABSTRACT

A field experiment was conducted at the University of Agricultural Sciences, Dharwad during *kharif* season of 2004, to study the effect of organics, biofertilizers, micronutrients and plant growth regulators on seed yield and quality of mothbean. The experiment consisted of eleven treatments laid out in randomised block design with three replications.

Results revealed that, the application of FYM 10 t per ha + RDF (10:20:0 kg NPK/ha) gave higher seed yield (1275 kg/ha) followed by vermicompost 4 t per ha of RDF (1261 kg/ha), FYM 5 t per ha (1235 kg/ha), vermicompost 2 t per ha of RDF (1228 kg/ha) over without organics (1059 kg/ha). The seed yield was significantly higher with the application of FYM 10 t per ha along with RDF (recommended dose of fertilizer) was attributed to higher number of braches (3.87), number of pods per plant (54.29) and 100 seed weight (2.28 g).

Among the treatments, application of FYM (10 t/ha along with RDF recorded significantly higher seedling length (43.46 cm), root length (26.10 cm), seedling vigour index (4277), germination rate index (43.77) and seedling dry weight (92.0 mg) followed by RDF + vermicompost 4 t per ha and RDF + FYM 5 t per ha over control.

Application of FYM 5 t per ha along with RDF recorded higher net returns (Rs. 24,706) and B:C ratio (2.91) compared to other treatments.

INFLUENCE OF INTEGRATED PLANT NUTRITION ON CROP GROWTH, SEED YIELD AND QUALITY IN LINSEED (*Linum usitatissimum*) Cv. S-36

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ABSTRACT

The field experiments were conducted at the Main Agricultural Research Station, University of Agricultural Sciences, Dharwad, during rabi season 2004, to study the influence of integrated plant nutrition on crop growth, seed yield and quality in linseed. The plant nutrition study consisting 14 treatment combinations of phosphorous, P-solubilizer and organic manures with control was laid out in Randomised Block Design with three replications. The results indicated that significantly higher growth and yield components viz., number of capsules per plant (30.00), number of seeds per capsule (7.52), seed yield per plant (1.84 g), seed yield per ha (635 kg/ha) and 1000 seed weight (7.9 g) were recorded with combined application of phosphorous (30 kg/ha), P-solubilizer (200 g/acre of seeds) and vermicompost (2.5 t/ha) besides higher seed quality parameters compared to other treatments.

The second experiment consisted of 11 treatment combinations involving four growth regulators and urea spray each at two concentrations with control was laid out in Randomised Block Design with factorial concept in three replications. Foliar spray of GA3 (40 ppm) recorded higher growth and yield parameters viz., capsules per plant (28.5), number of seeds per capsule (7.17), seed yield per plant (1.59 g) and per hectare (495.5 kg/ha) and also recorded significantly higher seed quality parameters. Between the concentrations, higher concentration gave significantly higher plant growth, seed yield and quality parameters.

VARIETAL CHARACTERIZATION BY MORPHOLOGICAL, CHEMICAL AND ELECTROPHORESIS OF COTTON (*Gossypium spp.*) HYBRIDS AND THEIR PARENTS

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ABSTRACT

The present investigation was undertaken to study varietal characterization in two interspecific hybrids and one intraspecific hybrid and their parents was carried out through morphological, chemical and biochemical markers.

A field experiment was conducted at Main Agricultural Research Station with randomized block design and laboratory studies were carried out in the Department of Seed Science and Technology and National Seed Project (NSP), University of Agricultural Sciences, Dharwad.

The various seed morphological attributes like seed shape, seed colour, fuzzy nature and colour, seed size and 100-seed weight were studied.

Seedling characters like shape of cotyledon, cotyledon texture and seedling hypocotyls pigmentation could be useful to identify the different cotton genotypes at 14th and 21st days after sowing.

The leaf characters viz., leaf size, leaf shape, leaf colour, leaf incision, leaf hairiness at peak flowering stage under fiddle conditions were recorded. The leaf shape, size and pubescence was useful in differentiating the cotton genotypes.

Morphological character like growth habit stem pigmentation, stem hairiness, plant height were recorded. The growth habit and pubescence on stem could be easily identified and categorized in to different groups.

The flowering character viz., days to 50 per cent flowering, petal colour, petal spot, anther colour, stigma position, boll shape, bract type and number of serrations and bract are useful in categorizing and differentiation the cotton genotypes.

Chemical tests such as sodium hydroxide and potassium hydroxide were useful to categorize the different cotton genotypes, seedling response to gibberellic acid and 2,4-D soak test was useful in differentiations cotton genotypes. The electrophoretic study of seed protein (globulin), genetic purity testing of cotton hybrids.

INFLUENCE OF SOWING TIME, SPACING AND FUNGICIDAL SPRAY ON SEED YIELD AND QUALITY IN NIGER (*Guizotia abyssinica* L.)

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ABSTRACT

Field experiment was conducted Agricultural Research Station, College of Agriculture, Dharwad during *kharif2004* to study the effect of time of sowing, spacing and fungicidal spray on crop growth, seed yield and quality of niger CV. N-71. The experimental results revealed that plant height, number of primary and secondary branches were higher in first sowing (July 1st) as compared to later sowings (July 15 and July 30). Sowing at wider spacing (45 x 10 cm) produced maximum number of branches, while closer spacing (30 x 10 cm) encouraged the higher plant height and fungicidal spray did not influence these traits. Leaf area index was more in first sowing but decreased with wider spacing and was non-significantly influenced by fungicidal spray. The interaction (T x S x F) was non-significant with respect to above parameters. Days to 50 per cent flowering and dry matter production at both flowering and harvesting was higher in first sowing and also with wider spacing. Fungicidal spray and in interactions of T x S x F did not influence above parameters. Second sowing with wider spacing and saaf fungicide spray increased the number of effective capitula per plant, filled seeds per capitula, 1000-seed weight, seed yield per plant and hectare basis, compared to earlier and later sowing, closer spacing and other fungicidal spray. While, the interaction effect (T x S x F) was found non significant with respect to above parameters. Seed quality parameters like germination percentage, root length, shoot length, field emergence and vigour index were maximum with saff fungicide spray over others. Sowing time, spacing and their interactions did not show significant effect on seed quality. July 15th sowing at 45 x 10 cm spacing along with saaf (F2) or quintal (Fa) fungicidal spray recorded lower disease incidence (62.00%) and seed infection (23.33%) compared to other treatments.

INFLUENCE OF THE AGE OF THE SEED ON PLANT GROWTH, SEED YIELD AND QUALITY AND CHARACTERIZATION OF FRENCH BEAN GENOTYPES

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ABSTRACT

The field and laboratory experiments on seed (six and twelve months aged) in five french bean genotypes (DWD-FEB-1, DWD-FEB-53, DWD-FEB-57, Contender and IIHR-909) on growth, Seed yield and quality were conducted during *kharif* season 2004. The study revealed that six months aged seed recorded significant results for plant height (28.0 cm), number of branches (8.5), number of leaves (14.0) and dry weight (12.9 g) compared to 12 months aged seed. The pod length (13.6 cm), pod weight (2.8 g), pod number per plant (19.7), seed number per pod (5.7), 100 seed weight (20.7 g), seed yield (2162 kg/ha) and seed recovery (93.35%) were 'significantly higher with. 'six months aged seeds, while the seed quality parameters viz., seed protein (17.8%), germination (91 .5%), germination rate index (30.6), root length (12.1 cm), shoot length (22.3 cm), vigour index (2687), seedling dry weight (27.1 mg), field emergence (89.3%), EC of seed leachate (1.27 dSm-l) were not significantly influenced by the age of the seed and genotypes. Among the genotypes DWD-FEB-1 recorded significantly higher height (18.9 cm), branches (7.4), leaf number (8.5), pod number per plant (19.8), pod length (13.5 cm), seed number per pod (5.70), seed yield per plant (28.7 g) and per ha (2115 kg), while all these parameters were lowest with IIHR-909. Interaction due to age of the seed and genotypes did not show significant differences for growth, seed yield and seed quality parameters.

Characterization study was made for 1 2 french bean genotypes for seed coat colour, hilum colour, shape, length, girth and 100 seed weight. Seedling morphology for hypocotyl colour, plant morphological characters for petal colour, days to flower initiation, days to 50 per cent flowering, days to pod maturity, pod length, pod colour, po.d shape, and seed number per pod were also studied.

CROP LOSS ESTIMATION AND MANAGEMENT OF SHOOT BUG *Peregrinus maidis* (Ashmead) IN RABI SORGHUM

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ABSTRACT

The investigations were undertaken at the AICRP on sorghum, RARS, Bijapur during *rabi* 2004-05 on loss estimation, varietal reaction and management of shoot bug.

Natural infestation of shoot bug resulted in the yield loss of 11.16, 21.11 and 2.97% in grain yield, fodder yield and 1000-grain weight across the different dates of sowing. The unprotected plot recorded significantly higher sorghum stripe disease incidence as compared to protected ones (18.72% and 9.51%). Under graded level of infestation, the yield reduction ranged from 7.1 to 51.3% and 9.1 to 49.7% in grain and fodder yield with release of 5 to 30 first instar nymphs per plant. The economic injury level of shoot bug is 3.13 per plant.

Among the 80 genotypes screened against shoot bug the lines *viz.*, 61611, 61612, CK 60B, Swati, and RS 29 were promising by recording lower population (<2 shoot bugs/plant). Other entries recorded shoot bug population between 2 to 10 plant⁻¹.

The lowest shoot bug population (18.53 / 5 plants) was recorded by thiamethoxam 70 WS @ 3 g kg⁻¹ seeds and was at par with imidacloprid 70 WS @ 5 g kg⁻¹ seeds. Carbosulfan 25 DS @ 20 g kg⁻¹ seeds recorded 21.33 and 23.40 shoot bugs per five plants. The maximum grain yield of 20.13 q ha⁻¹ was observed in seed treatment with thiamethoxam 70 WS @ 3 g kg⁻¹ seed. The seed treatment with imidacloprid 70 WS @ 5 g kg⁻¹ and carbosulfan 25 DS @ 20 g kg⁻¹ recorded grain yield of 19.43 and 19.27 q ha⁻¹, respectively.

The treatment with thiamethoxam 70 WS @ 3 g kg⁻¹ seeds produced higher fodder yield of 6.23 t ha⁻¹ which was at par with seed dressing by imidacloprid 70 WS @ 5 g kg⁻¹ seeds and carbosulfan 25 DS @ 20 g kg⁻¹ seeds by harvesting 6.03 and 5.70 t ha⁻¹, respectively.

The seed treatment by thiamethoxam 70 WS @ 3 g per kg seeds resulted in higher net profits of Rs. 15902 ha⁻¹ which was on par with the seed treatment by carbosulfan 25 DS @ 20 g per kg seeds.

**EFFECT OF DIFFERENT FORMULATIONS OF *Nomuraea rileyi* (Farlow) Samson
AND SPRAY EQUIPMENTS IN THE MANAGEMENT OF TOBACCO
CATERPILLAR IN GROUNDNUT AND POD BORER IN CHICKPEA**

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ABSTRACT

The effect of different formulations of *Nomuraea rileyi* (Farlow) Samson and spray equipments in the management of tobacco caterpillar in groundnut and pod borer in chickpea was studied during kharif and *rabi* season during 2002-03 at the Main Agricultural Research Station, University of Agricultural Sciences, Dharwad. Different formulations of *N. rileyi* viz., oil based, wettable powder and crude formulation were evaluated against third instar larvae of *Spodoptera litura* and *Helicoverpa armigera*. The results indicated in vitro that mortality of *S. litura* and *H. armigera* reached 95.00 and 93.20 per cent, respectively after 10 DAT with oil based formulation of *N. rileyi* @ 2×10^8 conidia per ml followed by wettable powder formulation and crude formulation.

In groundnut crop ecosystem, different formulations of *N. rileyi* and spray equipments were evaluated, the results indicated that oil based formulation of *N. rileyi* with knapsack sprayer recorded significantly higher mycosis (47.43%), followed by wettable powder and crude formulation. With respect to cost economics concerned oil based formulation of *N. rileyi* @ 2×10^{11} conidia per ha recorded net returns of Rs. 17,360 with B:C ratio of 2.8, which is next best to RPP.

In chickpea ecosystem, among different formulations of *N. rileyi* and spray equipments, oil based formulation of *N. rileyi* with knapsack sprayer recorded significantly higher mycosis (42.96%) with lowest per cent pod damage (26.43%). With respect to cost economics concerned oil based formulation of *N. rileyi* with knapsack sprayer recorded net returns of Rs. 11,952 with B:C ratio of 2.9, which is next best to RPP.

The highest persistent toxicity (PT) value was recorded in oil based formulation of *N. rileyi* by recording 0.9×10^2 CFU (colony forming unit) per 5 leaves followed by wettable powder and crude formulation.

SEASONAL INCIDENCE, VARIETAL PREFERENCE AND MANAGEMENT OF BER FRUIT AND FRUIT FLIES

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ABSTRACT

Investigation on the Seasonal incidence and preference and management of ber fruit borer and fruit flies were carried out from 1997 -98 at the Regional Agricultural Research Station, Bijapur. The incidence of fruit borer and fruit flies started in second week of August and first week of October respectively. The borer activity reached high from second week of November to the end of January. Whereas, high incidence of flies noticed from November to third week of January.

Among the eight varieties of ber screened, Illaichi recorded lowest infestation and is considered as moderately resistant against fruit borer and fruit flies. Umran recorded highest infestation of fruit borer while Sanaur-2, Umran, kadaka and Sanaur-6 were moderately susceptible to fruit flies infestation. Umran recorded maximum of 5 fruit borer larvae per fruit while Sanaur-2 had recorded maximum of 10 larvae of fruit flies per fruit.

Increase in the fruit size resulted in the increase of oviposition by both the pests. Maximum emergence of adults was observed when pupae were at a depth of 2 cm below soil and loss due to fruit borer and fruit flies together was found to vary from 70.81 to 71.28 with an average of 71.05 per cent. The maximum loss due to damage by borer was 42.92 and that by flies was 28.12 per cent.

Monocrotophos 36 SL was found effective against fruit borer and the same with jaggery was effective against fruit flies and NSKE 5% was found effective among botanicals in reducing the pest infestation and for effective control of pests three sprays at 12,14 and 16th week after 50 per cent flowering was more economical. The residues of the chemicals after the last spray were below the tolerance limit.

RESPONSE OF V-1 HYBRID RAISED ON BLACK SOILS TO APPLICATION OF GRADED LEVELS OF NITROGEN AND THEIR EFFECT ON *Bombyx mori* L.

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ABSTRACT

A study was conducted at Main Research Station, Dharwad during 2002-04 under irrigated conditions to study the "Response of V-1 mulberry hybrid raised on black soils to application of graded levels of nitrogen and in turn their effect on *Bombyx mori* L." There are eight treatments laid out in a randomized complete block design with three replications.

Among the graded levels, application of 280 to 300 kg N was significantly superior to all other treatments with respect to 100-leaf weight (299.72 and 272.22 g/plant), leaf and shoot yield per plant (475.83 and 458.05 and 346.66 and 334.44 g/plant), leaf and shoot yield per crop (8.46 and 8.14 t and 9.36 and 9.14 t/ha/crop) at 60th day after pruning, respectively.

Similar to leaf yield, 280 and 300 kg N recorded significantly maximum relative water content (81.89 and 78.59%, leaf nitrogen (4.42 and 4.44%) and crude protein (27.76 and 26.53%) except moisture, chlorophyll a, b and total chlorophyll and sugar contents as compared to standard (350 kg N) and untreated check.

Among the different order of leaves, tender leaves recorded maximum total nitrogen and crude protein compared to medium and coarse leaves. Chlorophyll a, b and total chlorophyll and sugar content were higher in middle leaves. Coarse leaves recorded higher relative water content but low moisture content. 280 and 300 kg N registered maximum chawki (3.51 and 3.33 g), mature larval weight (34.72 and 34.22 g), silk gland weight (1.70 and 1.59 g), lower disease incidence (7.10 and 10.58%) and ERR (92.95 and 89.38%). It was interesting to note that 280 kg N and 150 kg N + 2.5 t VC recorded higher cocoon yield of 16.46 and 16.47 kg per 10,000 larvae as compared to standard (350 kg N) and untreated check, respectively.

Among the rearing seasons, rainy season was the best and recorded lower disease incidence (8.38%) and maximum ERR (91.70%) as compared to winter and summer seasons. Application of 280 kg N during rainy season was significantly superior to mature larval weight, cocoon weight, pupal weight and shell weight.

**STUDIES ON MANAGEMNT OF ROOT ROT OF *coleus forskohlii* (Wild.) Briq
CASUED BY *Fusarium chlamydosporum* (Frag. and cif.) BOOTH AND
Rhizoctonia bataticola (Taub.) Butler**

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ABSTRACT

Coleus forskohlii is an important medicinal crop, which is the known source of forskolin. The crop is subjected to attack by several diseases among which root rot caused by *Fusarium chlamydosporum* and *Rhizoctonia bataticola* are the most important.

The pathogens were isolated by following standard tissue isolation technique from infected plant parts and identified as *F. chlamydosporum* and *R. bataticola* on the basis of morphological characters. Among the solid and liquid media tested, maximum growth of both the fungi was supported by PDA and Richards's broth, respectively. In growth phase studies, maximum growth was reached on 16th day of incubation in *F. chlamydosporum* and 12th day in case of *R. bataticola*. Among carbon, nitrogen and sulphur sources tested; sucrose, potassium nitrate and magnesium sulphate supported maximum growth in both the fungi. The temperature studies revealed the maximum growth of the fungi *F. chlamydosporum* and *R. bataticola* were observed at 30°C. Maximum growth of these fungi was obtained at pH 7.0 and 6.5, respectively. The toxic metabolites of both the fungi were proved to be thermostable and retained their toxicity even after autoclaving at 1.1 kg per cm² pressure, while by diluting with water, its toxicity was reduced to a great extent. *T. viride* was found to be the best antagonist in inhibiting the growth of both the pathogens. The parthenium leaf extract at 10 per cent was found to be the most effective in inhibiting the mycelial growth of both the pathogens. The systemic fungicides, carbendazim and propiconazole were found effective in inhibiting the growth of *F. chlamydosporum* and *R. bataticola*. Among non-systemic fungicides, chlorothalonil and captan were found to be the best in inhibiting the growth of both the fungi. Genotypes 1, 2 and *C. zeylanicus* were found resistant to *F. chlamydosporum*. Whereas, only *C. zeylanicus* showed resistant reaction against *R. bataticola*. Management studies in pot culture revealed that parathenium + propiconazole + *T. viride* and parthenium + Captan + *T. viride* treatments recorded lowest per cent mortality due to *F. chlamydosporum* and *R. bataticola*.

MARKET INTEGRATION FOR MAJOR AGRICULTURAL COMMODITIES IN KOLAR DISTRICT

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ABSTRACT

Market integration concept explain the relationship between two markets that are spatially or temporally separated. One of the common indicators of an efficient functioning of the markets is the existence of high degree of integration among them. Mixed trend was noticed in arrivals and prices of the all the commodities in all the markets. Majority of the markets shown increasing trend in arrivals and prices in the later periods. Arrivals of potato was maximum during September and November in Bangalore market whereas in other markets it was during February and March. Prices of potato found highest during off season and lowest during harvest period. Arrivals of onion, ragi and groundnut found maximum during harvesting months. Groundnut prices remained unchanged irrespective of increase or decrease in the arrivals. Uneven cycles were found in all the markets for all the commodities. Negative association between arrivals and prices was found in all the commodities in the selected markets except Srinivasapur and Bangalore. Positive correlation was found in arrivals and prices of groundnut in Bangalore market and Srinivasapur market revealed that the arrivals and prices of ragi and onion responded in the same direction. Distributed lag results of potato prices revealed that the Chikkaballapur took less than a day to transfer the price signals from Bangalore market followed by Srinivasapur (3.48 days), Chintamani (13.03 days) and Kolar (16.18 days). In case of onion Chikkaballapur took 1.38 days followed by Chintamani (4.38 days), Kolar (7.45 days) and Srinivasapur (7.93 days) to reflect the Bangalore onion prices. Kolar took 8.339 days to reflect Bangalore ragi prices and more number of days was observed in Srinivasapur market. In case of groundnut prices Kolar took less than 6 days and it was highest (16.01 days) in Srinivasapur market.

MARKETING MANAGEMENT OF POUTRE PRODUCTS – A CASE STUDY ON IMPACT OF BIRD FLU IN DHARWAD DISTRICT

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ABSTRACT

Animal prod traditional sources of food products consumed by peoples since pre-historic times. They provide essential amino acids, minerals, fats and vitamins. The spread of avian influenza in chickens across neighboring countries has drastically reduced the consumption of poultry eggs and meat in the country. In this context, the present study was conducted in Dharwad-Hubli twin cities during the year 2003-04. The necessary primary data was collected from the individual and bulk consumers and the various market intermediaries. The overall consumption of chicken and egg during bird f/v. was decreased as compared to before bird flu. In case of individual consumers chicken consumption during bird flu was decreased to 68.67 per cent and 39.74 per cent in eggs as compared to before bird flu. In case of bulk consumers chicken consumption during bird flu was decreased to 54.66 per cent and 8.33 per cent in eggs as compared to before bird flu. The overall reduction in the consumption was mainly due to the fear. The similar impact was observed on sale and purchase by the market intermediaries due to lower demand during the period. The source of information about bird flu was from the mass media communications. About 68.33 per cent of the individual consumer and 60 per cent of bulk consumer gathered the bird flu information through mass media like TV, Radio, Newspapers etc., Most of the consumers (76.66 %) shifted their consumption to other products like mutton (46.66%), beef (40 %) and fish (21.66%) during bird flu and about 20 per cent of the consumers prefer to purchase chicken and eggs from hygienic sources and the impact is over come by giving awareness programmes about bird flu for farmers, consumers as well as market intermediaries.

MARKETING MANAGEMENT OF NON-TIMBER FOREST PRODUCE IN GOKAK TALUK (KARNATAKA)

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ABSTRACT

The study on marketing management of forest produce (NTFP) as conducted in Gokak taluk of Belgaum district. In the forests of this taluk, white gum and marking nut were the two major NTFP selected for the study are available in large quantities. To evaluate the objectives of the study, multistage random sampling procedure was used for collecting the data from selected NTFP collectors, traders and end-user industries.

The collectors of selected NTFP are mainly landless labourers. The contribution from collection and marketing of forest produce to the total employment was more than half of the total number of days (54.02%) and more than three-fourth of their income was derived from selected NTFP activities (78.80%). Gender equity in employment generation was found that the women share was more in collection of both the produces. In case of white gum, the percentage share of women to men ratio was 53.17 and 46.83 per cent, respectively. In case of marking nut, the ratio was 59.86 and 40.14 per cent for women and men, respectively.

Two important marketing channels were found in the sale of white gum viz., Collector -> Wholesaler-cum-retailer -> SMUs; Collector -> Village merchant -> Wholesaler-cum-retailer -> SMUs. Similarly, there are three marketing channels in the sale of marking nut viz., Collector -> Processor -> SMUs; Collector -> Village merchant -> Processor -> SMUs and Collector -> Village merchant -> Processor -> Wholesaler-cum-retailer -> SMUs. In the sale of white gum the producer's share in consumer's price was found to be 65.08 per cent and the marketing efficiency ratio was 1.86 in channel-I. Similarly, in the sale of marking nut, the producer's share in consumer's price was found to be 43.33 per cent and marketing efficiency ratio was 0.76 in channel-I.

All the collectors, traders and end-users opined that lack of market facility was the major problem. The processors opined that health injury was the major problem while processing. Efforts may be made to increase the availability of NTFP in the region by forest department and it is recommended to collectors to establish their own association/co-operative for collection and marketing of their produce.

STUDY ON KNOWLEDGE AND ADOPTION OF ROSE GROWING FARMERS IN KARNATAKA

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K.V. NATIKAR (Major Advisor)

ABSTRACT

The study was conducted in Bangalore rural district of South Karnataka and Belgaum district of North Karnataka during the year 2004-05. The districts were selected keeping area and production of rose as criterion. In Bangalore rural district, Oevanahalli and Hoskote taluks, similarly in Belgaum district, Belgaum and Gokak taluks were purposively selected. From each taluk of Bangalore rural district and Belgaum district, 40 and 20 rose growers were selected using the same criteria constituting a total sample of 120.

More than 43 per cent of the rose growers had high knowledge level about recommended cultivation practices. About 49.17 per cent of the respondents had fallen under high adoption category and 34.17 per cent of the respondents were under medium adoption category.

Majority of the respondents belonged to middle age group, had low farming experience and semi-medium land holding. More than 28 per cent of the respondents studied up to high school. Majority of the respondents had medium extension contact (60.00%), medium extension participation (59.17%), medium mass media participation (55.00%), medium risk orientation (69.17%), medium economic motivation (61.67%) and medium innovativeness (61.67%). Cent per cent of the respondents had knowledge and adopted number of pruning and stage of harvesting. More than 99 per cent of the farmers cultivated recommended variety and harvested in right time. More than half of the respondents (55.83%) obtained recommended yield. Majority of respondents expressed the production problems like problem of pests (87.50%), diseases (85.83%) and high investment (69.17%). Further, majority of the respondents expressed the marketing problems "like exploitation by the middle man (78.83%), fluctuation in price (75.00%) and low price for flowers (70.83%).

STUDIES ON SEDIMENTATION IN TUNTAPUR IRRIGATION TANK UNDER AGRO-CLIMATIC CONDITIONS NORTH EASTERN DRY ZONE

C. Nagabhushana

Major Advisor:Er.M.Nemichandrappa

Unsustainable management practices followed in the catchment of Tuntapur tank situated in Raichur District have lead to the problem of siltation in its water spread area. The process of siltation ha reduced the storage capacity in the tank. In order to control erosion by taking suitable management practices in catchment area the information about the runoff, quantity and the rate of sediment yield is necessary..Hence the quantity of sediment deposited in the Tuntapur tank was measured using appropriate survey methods. The rate of sediment flowing into the water spread area also estimated by Morgan Morgan Finney revised soil loss prediction model in order to facilitate the designers to gauge the viability of the tank. The contribution of the runoff volume to the tank from different land uses were estimated and found that it is maximum (240.216mm) in case of wastelands an minimum (82.6423mm) in case of groundnut against rainfall of 911.7mm (1993) where as in the year 1997 against the lower quantity of rainfall (450.4mm) the maximum runoff (86.3087mm) in case of wastelands and minimum ((20.5827) in case of groundnut cultivable area. From the estimated values of total volume of (m^3) of soil loss it was found that 41229.49 m^3 of soil is evident under Wasteland(2) condition followed by 10209.49 m^3 under Wasteland(1) land use condition , 118.26 m^3 under eucalyptus plantation, 84.95 m^3 under paddy field and 17.67 m^3 under groundnut land use condition. The total estimated volume of soil loss from whole catchment is 51659.86 m^3 during the span from 1993-2002 whereas measured volume is 72454.5 m^3 . It was found that the estimated sediment yield was 71.30 percent of measured yield. The results shown that the model has given estimated value of sediment yield with discrepancy of 28.70 per cent.

EFFECT OF DIFFERENT SOURCES OF NUTRIENTS ON GROWTH AND YIELD OF TALL MARIGOLD CV. ORANGE DOUBLE

Shashikant

Major Advisor :Dr. A.H. Hugar

A field experiment was conducted at new orchard. Regional Agricultural Research station, Raichur during rabi season of 2003-2004 to study the effect of different sources of nutrients on the growth flower and seed yield of tall marigold (*Tagetes erecta* L.) Cv. Orange Double. The experiment consisted of eighteen treatments laid out in randomized block design with three replications. Results revealed that the treatments RDF+ Vermicompost @ 5 tonnes per hectare recorded maximum plant height, number of branches per plant number of leaves per plant.leaf area per plant and total dry weight which were kept significant positive relationship with flower and seed yield per hectare. The higher flower yield per hectare (13.9 t ha^{-1}) in above treatment was associated with the increase in the size of flower. Weight of 10 flower and number of flowers per plant. The seed yield parameters (seed yield per plant and 1000 seed weight) responsible for higher seed yield (7.87 q ha^{-1}) was also noticed in the treatment RDF + Vermicompost, @ 5 tonnes per hectare. The next best treatment in the experiment was RDF + poultry manure @ 5 tonnes per hectare after the RDF + Vermicompost @ 5 tonnes per hectare in respect to flower yield and seed yield including growth and yield parameters. The economic analysis indicated the superiority of the treatment RDF + Poultry manure (i), 5 tonnes per hectare which recorded higher net returns (Rs.1.15,106 ha^{-1}) and B:C ratio (6.5) compared to other treatments.

INFLUENCE OF ROOTSTOCKS ON GROWTH, FLOWERING AND QUALITY OF ROSE VARIETIES

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ABSTRACT

The present investigations were conducted in Floriculture Unit of University of University of Agricultural Sciences, Dharwad to study the compatibility of rose varieties with different rootstocks, their performance and the effect of rootstocks on quality and vase life of rose varieties. The varieties used were Gladiator, Arjun, Sophia Laurence, Golden Times and Montezuma. The rootstocks used were *Rosa multiflora*, *Rosa indica* and *Rosa canina*.

The interactions between the rootstocks and varieties were found to be non-significant in most cases. However, the varieties budded on *R. multiflora* recorded maximum bud take percentage. Among the growth parameters, Sophia Laurence budded on *R. canina* recorded maximum plant height and plant girth, while the same variety on *R. multiflora* recorded maximum number of leaves and number of branches per plant. Among the flower characters, Golden Times budded on *R. canina* took minimum number of days for flower bud initiation while Montezuma budded on *R. indica* took minimum days for bud bursting. Gladiator budded on *R. multiflora* recorded maximum flower bud diameter; while the same variety budded on *R. canina* recorded maximum flower bud weight. Sophia Laurence budded on *R. multiflora* recorded maximum number of flowers per plant while, same variety on *R. canina* recorded maximum stalk length. Vase life studies showed no significant interactions between rootstock and scion used. Gladiator variety recorded maximum vase life in tap water and in sucrose (3%) solution while Sophia Laurence recorded maximum vase life in aluminium sulphate (70 ppm) solution.

The present study revealed that Sophia Laurence recorded maximum yield per plant in the first year of budding and maximum stalk length and other desirable cut flower characteristics and among rootstocks *R. multiflora* followed by *R. canina* gave maximum vigour to the varieties budded which in turn gave maximum yield.

EFFECT OF TYPES OF PINCHING ON DIFFERENT VARIETIES OF CARNATION (DIANTHUS CARYOPHYLLUS L.) UNDER NATURALLY VENTILATED POLYHOUSE

V.Y. Ryagi

Major Advisor: Dr. S.M. Mantur

The experiment was carried out to study the effect of pinching on different varieties of carnation under naturally ventilated polyhouse during 2002-03 at department of Horticulture, college of Agriculture, Bijapur. The maximum plant height was recorded in variety Dover followed by Cherry Solar. Pinching treatments resulted in depressing effects on the plant height and it was significantly reduced by pinching the plants twice (double pinching) as compared to single pinching. The number of branches was found maximum in variety Domingo. Number of inter nodes per branch were maximum in variety Cherry Solar followed by Solar. Among different pinching methods more number of inter nodes observed in double pinched plants. Variety Cherry Solar had maximum inter nodal length and in single and half pinched plant.. Maximum number of leaves per plant was in variety Domingo and among pinching treatments single pinching recorded more number of leaves. The leaf length was maximum in variety Cherry Solar. The maximum leaf length was recorded in case of single pinching. Among the varieties significantly more number of total flowers were recorded in variety Domingo (112.54/m²). Among pinching treatments significantly more number of total flowers were recorded in single pinching (74.52/m²). Among interaction the maximum number of flowers were recorded in treatment combination of Domingo with single pinching (117.65/ m²). The maximum flowers stalk length was recorded in variety Yellow Solar (88.63 cm). In case of pinching it was maximum in single pinching (92.26cm). The stalk girth was maximum in variety Domingo. The double pinched plants produced the thicker flower stalks. Significantly more vase life was observed in variety Yellow Solar (8.52days).

STANDARDISATION OF DRYING TECHNIQUES IN GERBERA FOR VALUE ADDITION

Vijayalaxmi Sanganal

Major Advisor: Dr.J.Dinakara Adiga

Experiments were carried out at Kittur Rani Channamma College of Horticulture, Arabhavi on drying of cut gerbera flowers for obtaining best quality dry Gerbera flowers. Data on shade drying of flowers harvested at two different stages, viz., fully opened flowers and flowers harvested at three days before harvesting stage embedded in different desiccants (sand, silica gel and mixture to sand and silica gel) revealed that desiccating the open flowers in silica gel was superior with respect to colour, texture, appearance and shape. Less number of days (6.54) was required to dry open flowers than flowers harvested at three days before harvesting stage (7.53 days). Silica gel desiccated the flowers faster (5.00 days) than sand (9.70 days). Experiment on glycerol pretreatment showed improvement in suppleness of dried gerbera flowers. The flowers treated with 1:3 glycerol to water for three hours maintained best texture, colour, shape and appearance. The same treatment took the minimum days (5.00 days) for drying. In hot air oven, fully opened flowers could be dried well at 40⁰ C for 77 hours with silica gel as desiccant. This was also associated with better scores for quality parameters like colour, shape, texture and appearance. Microwaving of flowers at medium low level for three minutes and low level for four minutes produced best dried flowers when silica gel was used as desiccant. Data on comparison of different drying methods, viz., shade, sun, oven and microwave along with two desiccants (sand and silica gel) revealed that drying fully opened flowers in shade for 125.60 hours and in microwave oven for 0.11 hours by embedding in silica gel can produce best quality dried gerbera flowers with respect to colour, shape, appearance and texture. Fully opened flowers embedded in silica gel performed best with respect to quality parameters and also retaining the highest xanthophylls content (64.11%).

DEPRESSION AND ANXIETY AMONG DESTITUTE WOMEN

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ABSTRACT

The present study was carried to know the factors influencing the level of depression and anxiety among destitute women. The sample comprised of 45 destitute women with the age ranging between 20-56 years. To assess the level of depression, scale constructed and standardized by Karim and Tiwari (1986) was used. To assess the level of anxiety standardized scale constructed by Brivastava and Tiwari (1985) was used. The results were analyzed using suitable statistical methods. The results revealed that larger proportion of respondents had high level of depression and many of the respondents had low level of anxiety. The percentage of destitute women who had very high level of depression were highly anxious. The level, of depression and anxiety were significantly higher among early adult's. Unmarried respondents had high level of depression and married women had high level of anxiety. The depression and anxiety level was found to be higher among the respondents belonging to joint family however the depression was more among the respondents of medium and large size family but size of family had no significant influence on the level of anxiety. Per capita income had significant influence on the level of depression and anxiety among the destitute women.