Agriculture

Agricultural Entomology

University of Agricultural and Horticultural Sciences, Shivamogga

M. Sc. (Agri.) theses abstracts produced in the

Department of Agricultural Entomology

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1. Diversity of Fruit Sucking Moths (Erebidae: Lepidoptera) in Fruit Crops Ecosystem and Their Management

(DURGA, G.)

ABSTRACT

Fruit sucking moths (Lepidoptera: Erebidae) are serious pests on fruit crops by sucking the juice which results in yield loss. There is a lack of information about their taxonomy, ecology, ethology and hence it is quite difficult to manage the same. Therefore, studies were aimed at characterizing species diversity of fruit sucking moths and developing DNA barcodes in order to use them as a database for future studies. Studies were also conducted to identify an efficient trap in order to attract and manage the fruit sucking moths. A total of 421 fruit sucking moths were collected on Guava, Pomegranate, Starfruit and Barbados cherry in different places of Karnataka like, Shivamogga, Mudigere and Hiriyur among which, species of subfamilies Catocalinae and Calpinae were high in number. Fruit sucking moths belonging to the Genus Eudocima, Ercheia, Pericyma, Anomis, Calyptra, Oraesia, Serrodes, Achanthodelta, Artena, Ophuisa and Thyas were recorded as primary piercers and species of Erebus, Grammodes, Hypopyra, Mocis, Spirama and Ericeia were recorded as secondary piercers. DNA barcodes for all the species identified morphologically were developed and the sequences of their mtCOI genes were submitted to the NCBI GenBankdatabase. Analysis of the phylogenetic tree showed that, species of same genera clustered together based on the similarity of the mtCOI sequence. In conclusion, morphological species identification of fruit sucking moths was generally congruent with molecular methods. Among different types of fruit baited traps evaluated, significantly higher number of moths were attracted to traps in which ripened banana was placed at two positions (23 moths/trap/week) followed by ripened banana placed at one position.

August, 2019

(Kalleshwara swamy, C.M.)
Major Advisor

2. Evaluation of Hybrids and Insecticides against Serpentine Leaf miner, Liriomyzatrifolii (Burgess) Diptera: Agromyzidae on Tomato

(PARSI HIMABINDU)

ABSTRACT

Study on incidence of serpentine leaf miner was carried out during 2018-19. The mean number of live mines/five compound leaves ranged between 1.52 and 17.21 with an average of 10.04 mines and per cent damaged leaves ranged from 20.00 to 57.95 with an average of 46.64 per cent. Peak activity based on mean number of live mines was observed during December and January and highest per cent damaged leaves was noticed from 4th week of December to first week of February. There was a significant negative correlation between number of mines and minimum temperature (0C) (-0.782*), morning relative humidity (%) (-0.556*), evening relative humidity (%) (-0.580*) and rainfall (mm) (-0.573*) and a positive significant correlation with wind speed (km/hr) (0.598**) was observed. Three parasitoids species namely OpiusdissitusMuesebeck, NeochrysocharisformosaWestwood and Neochrysocharissp. have emerged from reared larvae and pupae of leaf miner with an average per cent parasitization of 8.48 %, 3.04 % and 1.56 %, respectively. Screening of hybrids against leaf miner revealed that the hybrids Namadhari (3.61 mines) and Moulya (4.81 mines) recorded lowest number of mines and the hybrids Soubhagya (14.53 mines), ArkaRakshak (15.12 mines) and PHS-448 (17.68 mines) recorded highest number of mines. Evaluation of insecticides against leaf miner indicated that a significant reduction in number of mines and per cent damaged leaves was observed in emamectin benzoate 5 SG, spinetorum 11.7 SC, fipronil 5 SC, acephate 75 SP and imidacloprid 17.8 SL whereas, azadirachtin 1 EC was least effective. Emamectin benzoate recorded highest per cent increase (25.26%) in yield followed by spinetorum (21.91%), fipronil (18.14%) and acephate (14.78%) over control. The highest benefit cost ratio was obtained with emamectin benzoate 5 SG, followed by spinetorum 11.7 SC, fipronil 5 SC and acephate 75 SP with B:C ratio of 3.75, 3.58, 3.44 and 3.31, respectively.

August, 2019

(B. C. Hanumanthaswamy)
Major Advisor

3. Bee Forage Resources and Seasonal Development of Apis Cerana Fab. Colonies in Different Ecosystems

(RACHANA, A. P.)

ABSTRACT

Studies on "Bee forage resources and seasonal development of Apis cerana Fab. colonies in different ecosystems" were carried out at three locations representing maidan (AHRS, Bavikere), Semi malnad (UAHS, Shivamogga) and Rain forest (Thirthahalli) ecosystems during 2018-19. During the investigation, maximum number of bee forage species were recorded in Semi malnad followed by Rain forest and Maidan ecosystems. Seasonal development of bee colonies in three ecosystems indicated a significant difference between the ecosystems, between the fortnightly periods and between the fortnightly periods and ecosystems. Among the three ecosystems by considering all the colony developmental indicators viz., total brood, pollen and honey area, Rain forest ecosystem proved to be good compared to the other two ecosystems of Semi malnad and Maidan. The colony developmental indicators had a positive correlation with maximum temperature and morning relative humidity where as these were negatively correlated with minimum temperature, evening relative humidity and rain fall. Across the ecosystems the highest pollen diversity was observed in Maidan ecosystem, followed by Rain forest and Semi malnad ecosystems. The physical characteristics of honey collected from three ecosystems during the months of November – December, did not show any significant difference in respect of any of the parameters, whereas the honey samples collected during the months of March - April showed a significant difference in respect of moisture per cent and TS (%) content.

August, 2019

(R.N. Kencharaddi)
Major Advisor

4. Studies on Major Insect Pests of Chrysanthemum and Management under Naturally Ventilated Polyhouse Condition

(RAJESHWARI, A. N.)

ABSTRACT

An investigation was carried out on screening of chrysanthemum genotypes and management of whitefly, (Trialeurodes vaporariorum Westwood), serpentine leaf miner (Liriomyza trifolii Burgess) and aphid (Macrosiphoniella sanborni Gillette) by using newer insecticides and botanicals. The experiment was carried out in a naturally ventilated polyhouse condition during 2018-19 at College of Horticulture, Mudigere. Fourteen genotypes of chrysanthemum were evaluated among them, Kolkata Orange (0.61 nymphs/2 cm2 and 2.46 adults/leaf, respectively) was resistant to whitefly. Whereas, genotypes, Poornima White, Paper White, Rose and Poornima Yellow (2.60, 3.17, 3.27 and 3.85 mines/leaf, respectively with 20.14, 24.54, 24.59 and 25.71 % leaf miner infestation/plant, respectively) were categorized as resistant to leaf miner. Further, genotypes viz., Kavery, Rose, Poornima White, Violet, Chandini, Poornima Yellow and Red Ruby (6.76, 6.77, 7.90, 8.47, 11.73, 13.21 and 15.31 aphids/2 cm apical shoot, respectively) were categorised as moderately resistant to aphids. Among the insecticides tested, diafenthiuron 50 WP, dinotefuron 20 SC and flonicamid 50 WG was found to be superior in reducing the whitefly population whereas, dinotefuron 20 SC, flonicamid 50 WG, thiamethoxam 25 WG, fipronil 5 SC and triazophos 40 EC were proved to be effective in reducing leaf miner infestation. Whereas, dinotefuron 20 SC, flonicamid 50 WG and fipronil 5 SC were proved to effective in reducing aphid population. Among scheduling, T7 (fipronil 5 SC + flonicamid 50 WG + diafenthiuron 50 WP + thiamethoxam 25 WG) schedule was proved to be better in reducing whitefly, leaf miner and aphid population of chrysanthemum under naturally ventilated polyhouse condition.

August, 2019

(L. Hanumantharaya)
Major Advisor

5. Insect Pest Complex in Yard long bean with Special Reference to Sucking Pests and their Management

(RAMESH M MARADI)

ABSTRACT

Investigations on Insect pest complex in yard long bean with special reference to sucking pests and their managementwere carried out under field condition during 2018-19 at Agricultural and Horticultural Research Station, Bhavikere, UAHS, Shivamogga, Karnataka. The survey was conducted at fortnightly intervals during the crop growth period during 2018-19 in the farmers field of Shivamogga and Udupi district. The results of survey revealed that eight species of insect pest viz., aphids, Aphis craccivora, leafhopper,Emposcaterminalis, mites, Tetranychus urticae, thrips, Megalurothripsusitatus, Spotted pod borer,Marucavitrata, Gram pod borer, Helicovepa armigera, pod bug, Riptortuspedestrisand green plant bug, Nezara viridula and natural enemies like, Chrysoperlazastrowi, Spiders and Coccinellids like, Coccinella transversalis and Cheilomenes sexmaculata were recorded. The maximum population of insect pests and natural enemies were recorded in Rabi as compared to Kharif in Shivamogga district. Whereas, in Udupi district highest poupation of insect pests and natural enemies were recorded in Kharif as compared to Rabi. Seasonal incidence of sucking pests revealed that duringKharif, the peak population of aphids was recorded during first week of September, leaf hoppers population in third week of September, mites in first week of November and thrips during fourth week of September. During Rabi, the aphid population was maximum during first week of January and thrips population during second week of March. While, leafhopper and mite population was highest during second week of February. Among the different insecticides tested imidacloprid 17.8 SL @ 0.50 ml/land acetamiprid 20 SP@0.30 g/lwere found effective against aphids leaf hoppers and thrips. Whereas, spiromecifen 22.9 SC @ 0.50 ml/land diafenthiuron 50 WP @ 1.00 g/lproved highly effective against mite. The fruit yield and C: B ratio was relatively higher in imidacloprid (15.57 t/ ha and 1:4.76) treated plots followed by acetamiprid (15.10 t/ ha and 1: 4.73).

August, 2019

(Rajashekharappa, K.)
Major Advisor

6. Studies on Insect Pest Complex of Castor with Special Reference to Lepidopteran Pests

(RANGANATH, T. R.)

ABSTRACT

Studies on insect pest complex of castor with special reference to lepidopteran pests" was carried out at Agricultural and Horticultural Research Station, Bhavikere during 2018-19. During the investigation, eleven insect species were found feeding on different parts of the crop. Among them, seven species were leaf feeders, three were sucking pests and one was capsule borer, besides, two larval parasitoids, Microplitis maculipennis (Szepligeti) and Euplectrus leucostomus (Rohwer) were recorded on castor semilooper and Eriborus sp. on capsule borer. Correlation studies with weather parameters on Acathodelta janata (Linnaeus) and Spodoptera litura (Fabricius) showed significant negative correlation with wind speed, whereas, it had significant positive correlation with maximum temperature. Conogethes punctiferalis (Guenn.), Empoasca flavescens (Fabricius) and Nezara virudula (Linnaeus) had negative significant influence with minimum temperature, morning relative humidity, evening relative humidity and rainfall, while, it had positive significant influence with maximum temperature. Liriomyza trifolii (Burgess) had significant negative correlation with maximum temperature, whereas, it had significant positive correlation with morning relative humidity, evening relative humidity, rainfall and wind speed. Crop loss estimation studies revealed maximum yield loss in untreated control by recording 53.10 per cent, followed by protecting the crop up to 30 days (50.03%), up to 60 days (24.63%), up to 90 days (16.95%) and up to 120 days (6.14%) with chlorantraniliprole 18.5 SC @ 0.3 ml per litre compared to the treatment covered with nylon net. Flubendiamide 480 SC @ 0.2 ml per litre and chlorantraniliprole 18.5 SC @ 0.3 ml per litre were found to be highly effective in managing the lepidopteran pests of castor by recording the highest yield of 13.10 q/ha and 13.80 q/ha with a C:B ratio of 1:3.06 and 1:3.05, respectively. These were followed by spinosad 45 SC @ 0.3 ml per litre and indoxacarb 15.8 EC @ 1.00 ml per litre in reducing the larval population.

August, 2019

(Shivanna, B. K.)
Major Advisor

7. Population Dynamics and Management of Red Spider Mite, Tetranychus macfarlanei Baker and Pritchard (Acari: Tetranychidae) in Brinjal

(SHIVARAJ METI)

ABSTRACT

Studies on "Population dynamics and management of red spider mite, Tetranychus macfarlanei Baker and Pritchard (Acari: Tetranychidae) in brinjal" was carried out at Zonal Agricultural and Horticultural Research Station (ZAHRS), Shivamogga during Kharif and Rabi seasons of 2018-19. During the study, phytophagous mite species, T. macfarlanei and its natural enemies were recorded. The natural enemies comprised of predatory mite, Neoseiulus longispinosus (Evans) and insect predator, Scolothrips sexmaculatus (Pergande). In Kharif 2018, the peak incidence of red spider mite, T. macfarlanei (19.17 mites /2.5 cm2 leaf area) and the peak activity of predatory mite, N. longispinosus (1.92 mites / leaf) was observed during fourth week of September. In Rabi 2018-19, the peak activity of red spider mite, T. macfarlanei (24.52 mites / 2.5 cm2 leaf area) was noticed on fifth week of March and the peak predatory mite, N. longispinosus (2.38 mites / leaf) was noticed during fourth week of March. Among eight brinjal varieties screened against red spider mite, T. macfarlanei, Arka Shirish recorded lowest mean number of mite population (4.48 mites / 2.5 cm2 leaf area) with a total yield of 13.55 t/ha. The variety CVK recorded highest number of mites (12.01 mites / 2.5 cm2 leaf area) with total yield of 8.16 t/ha. Among the eight acaricides tested against red spider mite, T. macfarlanei the spiromesifen 22.9 SC (0.8 ml/l) proved to be highly effective in reducing the red spider mite population with a highest fruit yield of 14.76 t/ha followed by propargite 57 EC (1.5 ml/l) which recorded 13.72 t/ha. The cost-benefit ratio was also highest in spiromesifen (1:4.37) followed by propargite (1:4.25).

August, 2019

(S. Pradeep)
Major Advisor

8. Investigation on Insect and Mite Pest Complex of Marigold with Special Reference to the Management of Sucking Pests

(SHREELAKSHMI)

ABSTRACT

The research entitled "Investigation on insect and mite pest complex of marigold with special reference to the management of sucking pests" was carried out at Zonal Agricultural Research Station (ZAHRS), Shivamogga during 2A18-19. During the research study, eighteen insect pest species including two mite species were recorded on marigold. Out of the eighteen species, ten species were sucking pests, three were flower feeders and five were foliage feeders. Out of these, thrips, Neohydatothrips samayunkur Wahab, aphid, Myzus persicae (Sulzer), mite, Tetranychus urticae Koch and borers, Spodoptera spp. were the major ones. During Kharif, the population of thrips attained peak during August first week (8.24 thrips per flower). During Rabi season, the thrips population was maximum during January fourth week (19.64 thrips per flower). Correlation studies revealed that there was positive correlation with maximum and minimum temperature and negative correlation with rainfall. The population of aphids attained peak during September second week during Kharif (17.42 aphids per five cm twig). During Rabi season, the aphid population was maximum during December third week (24.36 aphids per five cm twig). Correlation studies revealed that aphids had significant positive correlation with maximum temperature and had negative correlation with minimum temperature and rainfall. The population of mites attained peak during September second week during Kharif (A.86 mites/ leaf), and during Rabi season the population was maximum during February first week (13.64 mites/ leaf). Correlation studies revealed that mite population had positive correlation with maximum and minimum temperature and had negative correlation with rainfall and relative humidity. Flonicamid 5A WDG @ A.3A g / l, imidacloprid 17.8 SL @ A.3A ml / l and diafenthiuron 5A WP @ 1.AA g / l were found to be most effective in managing thrips, aphids and mites of marigold, respectively. Cost Benefit ratio was highest with imidacloprid 17.8 SL (1: 2.54) by recording highest yield (9.5 t / ha).

August, 2019

(Jayalaxmi Narayan Hegde)
Major Advisor

9. Insect Pest Complex in Okra Ecosystem with Special Reference to Sucking Pests and their Management

(SUSHEELKUMAR)

ABSTRACT

The present investigations were carried out on 'Insect pest complex in okra ecosystem with special reference to sucking pests and their management' under field cultivation during 2018-19 at AHRS, Bhavikere UAHS, Shivamogga district, Karnataka.The survey was conducted at fortnightly intervals during the crop growth period to collect the different insect pests and their natural enemies in okra during 2018-19 in the farmers field of Shivamogga districts. During the survey eleven pest species of insects were recordedviz., Leafhopper, Amrascabiguttulabiguttula(Ishida); aphid, Aphis gossypii (Glover); whitefly, Bemisiatabaci(Genn.); shoot and fruit borer, Eariasvittella(Fab); fruit borer, Helicovepaarmigera(Hubner), dusky cotton bug, Oxycarenushyalinipennis(Fab); mite, Tetranychusurticae(Boisd.); green plant bug, Nezaraviridula(Linn.); blister beetle, Mylabrispustulata(Thunb.); and Grey weevil, Myllocerussp. And natural enemies like Chrysoperlazastrowi, Spiders and Coccinellids like, Coccinella transversalis (Fab.) and Cheilomenessexmaculata (Fabricius). The peak population of insect pests and natural enemies were noticed during Kharif in October and during January in Rabi.Studies on screening of fourteen okra genotypes revealed that Arka Anamika and Pusa A-4 recorded least number of aphids, leafhoppers and mites population, while least whitefly population was observed on Phule Utkarsh.Among the insecticides, Acetamiprid 20SP 0.3g/l was found effective against leafhopper whereas, Imidacloprid 17.8 SL0.5ml/l was most effective treatment in reducing aphid and whitefly population. Acaricide,fenazaquin 10 EC2ml/l, followed by diafenthiuron50WP 1 gm/ l proved highly effective against mite. The fruit yield was relatively higher in imidacloprid 17.8SL0.5ml/l (12.51 t/ ha), followed by acetamiprid20SP0.3g/l (11.80 t/ha) treated plots. The cost-benefit ratio was highest in imidacloprid 17.8SL 0.5ml/l (1: 4.02) treated plots followed by acetamiprid 20 SP0.3g/l 1:3.84) compared to untreated control plots which recorded lowest cost-benefit ratio (1:1.93).

August, 2019

(K.Rajashekharappa)
Major Advisor

Agricultural Extension

University of Agricultural and Horticultural Sciences, Shivamogga

M. Sc. (Agri.) theses abstracts produced in the

Department of Agricultural Extension

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1. A Study on Entrepreneurial Skills Acquainted by Students of UAHS Shivamogga through Agricultural Experential Learning Programme (AELP)

(CHAITHRASHREE, J.)

ABSTRACT

The study was conducted in four different colleges of University of Agricultural and Horticultural Sciences, Shivamogga of Karnataka state during 2018-19.A total of 120 students who undergone Agricultural Experiential Learning programme during the academic year 2016-17 and 2017-18were purposively selected.

The data was collected using pretested interview schedule. The results found thatabout 40.00 per cent of respondents had completely understood the course content and 41.66 per cent of respondents mentioned their source of information was senior friends, teachers and by own interest. Cent percent of respondents were understood the scope of AELP, majority of an equal (92.50 %) per cent of them had understood the aspects like concept of AELP and placements in AELP.

Nearly three fourth of the AELP respondents had moderately acquired(78.33 %) the entrepreneurial skills. Majority of the respondents had moderately acquired planning skills (81.66 %), organizing skills (95.83 %), staffing skills (43.33 %) and budgeting skills (81.66 %).Majority of AELP student's families had low annual income and had medium scientific orientation, self-confidence, leadership ability.innovativeness, risk orientation, achievement motivation, marketing orientation, management and decision making abilities.

The strength and weakness of AELP course was expressed by the students thatAELP was a merging of theory and practice (100.00 %) and inadequate availability of trained man power (87.50 %).With respect to opportunities and threats of AELP was expressed by the AELP students wasdemand from external agencies for products (85.83 %) and stringent financial rules and regulations (85.00 %).Cent per cent of AELP students expressed non-availability of appropriate technologies was a major constraint.Majority (78.33 %) of AELP students suggested that giving preference to student's interest while choosing a module.

August, 2019

(Amaresh Kumar. K)
Major Advisor

2. A Study on Knowledge and Adoption of Paddy Seed Production Practices by the Farmers of Davanagere District

(CHETAN, B.M.)

ABSTRACT

The present study was carried out in Davanagere district of Karnataka state during the year 2018-19 to know the knowledge and adoption of paddy seed production practices by the farmers of the district. A total sample consisting of 120 respondents from four major paddy seed producing taluks of the district were selected wherein three villages from each taluk and ten farmers from each village were interviewed using pre-tested interview schedule. The study revealed that majority(48.34 %) of the respondents were middle aged, having education upto PUC level (44.16 %) with medium (80.83%) family size, nearly half of the respondents were medium size land holder and 59.16 per cent of respondents had high farming experience and exactly half of respondents had moderate seed production experience. Whereas nearly half of the respondents (49.16%) were under medium income category.About 77.50 per cent of respondents hadmedium extension contact and 76.66 per cent of the respondents had medium social participation and 64.16 per cent of respondents had medium market orientation, while 69.16per cent of paddy seed production farmers had medium cosmopoliteness and majority (83.34%) of the farmershad medium innovativeness.Majority of paddy seed production farmers hadmedium (73.34 %) to low (15.00%) knowledgelevel. More than half of them had medium (65.84%) to high (21.66 %) adoption level with respect to overall adoption of paddy seed production practices.Lack of labours (76.66%) and difficulty in maintaining recommended spacing (75.83%) were the major constraints expressed by the respondents. The major suggestions given by respondents were early payment for produce sold in respective seed production agencies (82.50%) and promotion of mechanization or custom hiring system (69.16%).Hence, seed certification agencies should provide adequate training to the paddy seed production farmers to enhance their level of knowledge and adoption of paddy seed production technologies.

August, 2019 (Ramappa Patil)

Major Advisor

3. A Study on Performance of Farmer Producer Organizationsin Shivamogga District of Karnataka

(DHARMARAJ, B. M.)

ABSTRACT

The present study was conducted in the year 2018-19 to assess the performance of Farmer Producer Organizations (FPO) in Shivamogga district of Karnataka state. An expost-facto research design was engaged. A total of 120membersout of six FPO from four talukswere considered as the sample for the study.Data is collected through pre-tested semi structured interview schedule. The study revealed that exactly half of the FPOs (50.00 %) were having medium level of overall performance followed by high (33.33 %). All the FPOs were performing activities like custom hiring services, input supply, auditing of accounts, conduct of meetings, rules and regulations of the FPO,book keeping and documentation followed by 83.33 per cent of the FPOs possess internet facility and offering farm advocacy.Just abovehalf of the farmer members(52.50 %) were possessed medium level of knowledge and (52.50 %) of them belonged to middle aged group, more than half(58.33 %) of members had medium education category, about(40.00 %) of the membersweresemi mediumfarmers and less than half(42.50 %) of the them had low income.About 44.16 per centof the members had medium level of extension contact, 46.66 per cent of the members had medium level of extension participation and 42.50 per cent of them belong to medium level of organizational participation. Less than half of them (45.84 %) were distributed in medium level of economic motivation. Just below fifty per cent (48.34%)of the members had medium category of credit orientation. Majority of the members expressed the constraints such as problems related to lack of processing units (83.33 %),non-existence of procurement system (53.33%).The suggestions like establishment of processing units (71.66%), Procurement system to be improved (59.76 %), Credit facility can be enhanced 55.83 per cent of members were expressed.

August, 2019

(Basavaraj Beerannavar)
Major Advisor

4. A Study on Farmers Practices on Irrigation Methods in Arecanut Growing Areas of Chitradurga District

(NARENDRA, V.N.)

ABSTRACT

The study on farmers practices on irrigation methods in arecanut growing areas of Chitradurga district was conducted in Chitradurga district of Karnataka during 2018-19.By simple random sampling 40 each from drip, sprinkler, flood irrigation adopted farmers in Arecanut, constituting sample size 120.The data was collected using pretested interview schedule. The result showed that majority of the farmers (66.67%) had medium level of awareness on operational aspects of different irrigation methods. It was observed that as high water use efficiency in drip irrigation is 9.81 liters followed by sprinkler irrigation (13.15 liters), flood irrigation (19.18 liters) respectively. High economic efficiency will be observed in drip irrigation is Rs. 5.87(net returners per acre rupee of irrigation cost) followed by sprinkler irrigation (Rs. 4.58) and flood irrigation (Rs.3.89) .The average arecanut yield obtained per acre under drip, sprinkler and flood irrigation was 9.62 quintal, 8.56 quintal and 8.22 quintal respectively. Cost of cultivation of drip irrigation (Rs.98,868.94/acre),sprinkler irrigation (Rs.1,04,544.16/acre) and flood irrigation (Rs.98,247.23/acre). Net returns from drip irrigation is found be highest of Rs. 3,10,000.00 per acre. Majority of the farmers belonged to middle age category having medium farming experience. Majority of the farmers were educated up to PUC and had medium sized land holding. Majority of the farmers had medium level of innovative proneness, risk bearing ability, extension participation, extension contact, mass media exposure,cosmopoliteness,information seeking behavior, social participation.More than half of the farmers had high level of annual income.Major constraints faced by farmers 'high installation cost' in drip irrigation. 'Nozzle blocking' in sprinkler irrigation. 'High labour cost' in flood irrigation. The suggestions included 'MSP facility should be provided for arecanut' in drip irrigation farmers. 'Regular supply of electricity' in sprinkler irrigation farmers. 'Need of training for effective management of soil crusting' in case of flood irrigation.

August, 2019

(Sahana, S.)
Major Advisor

5. A Study on Knowledge and Perception of Farmers on Soil Health Card in Shivamogga District

(SANJANA, U. H.)

ABSTRACT

The study was conducted in Shivamogga district of Karnataka state during 2018-19 to assess the knowledge and perception of farmers on soil health card and to ascertain the constraints and suggestions for effective implementation of soil health card scheme. A total of 120 respondents were considered as a sample for the study. The study revealed that majority of the respondents possessed medium (61.66 %) level of overall knowledge regarding soil health card. The respondents had high level of knowledge on soil health (63.33 %), soil sampling and testing(59.16 %) and contents of soil health card (52.50 %). The respondents were found to have a medium (61.66 %) and low (21.67 %) level of perception about soil health card. Majority of the farmers perceived that soil health card gives crop wise recommendation of fertilizers and nutrients (57.50 %). About 45 per cent of the respondents belonged to middle age group and 38.33 per cent of them were educated up to high school level. More than half of the farmers had medium (51.66 %) social participation. Majority of the respondents had medium (70.00 %) level of mass media participation, 63.33 per cent of the respondents had medium scientific orientation and majority of the farmers had medium (73.33 %) level of source of information. Variables like education, extension contact, mass media participation, scientific orientation and source of informationshowed highly significant results with the knowledge. Variables like education, farming experience, and extension contact showed positive and significant association with the perception level of respondents. Soil testing labs should be available at the hobli levelwas suggested by 72.50 per cent of the respondents.There is a need for conducting more training programmes in shaping the capabilities and improving the knowledge of the farmers towards soil health card.

August, 2019

(Sudheendra, M)
Major Advisor

Agronomy

University of Agricultural and Horticultural Sciences, Shivamogga

M. Sc. (Agri.) theses abstracts produced in the

Department of Agronomy

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1. Variability in rainfall and rice production in Karnataka and their association with El Niño Southern Oscillation

(Shilpa Cherian)

ABSTRACT

Monsoon fluctuations due to El Niño Southern Oscillation (ENSO) have a reflective influence on rice productivity, which is the major food grain in India. The impact of ENSO on spatial variability of summer monsoon rainfall was analyzed for the period of 1950–2018 and that on Kharif rice production for the period of 1998-2016. It was clear from the analysis that El Niño Southern Oscillation had varied influences on rainfall as well as rice productivity over different rice growing districts of Karnataka.It was found that during El Niño (strong, moderate and weak) years, S-W monsoon rainfall was below normal in all the districts of Karnataka wherein, the highest negative deviation from the normal was recorded in Mysuru district (-22.76 %). During the La Niña (strong, moderate and weak) years, S-W monsoon rainfall was above normal in 13 districts in whichBengaluru rural district recorded highest per cent positive deviation (23.46 %).

Kharif rice yield was less than normal in 15 major rice growing districts of Karnataka and highest negative deviation from normal was observed in Bidar district (-25.09 %) during El Niño (strong, moderate and weak) years. Kharif rice yield was more than normal in 18 major rice growing districts of Karnataka and highest per cent change from normal was observed in Belagavi district (41.31%) during La Niña (strong, moderate and weak) years.The correlation between southwest monsoon rainfall and Kharifrice productivity during the El Niño years indicated that August rainfall contributed major share in variations in rice productivity. Analysis of ENSO impact on spatial rice productivity could be useful for formulating farm-level site specific management planning and policy decisions.

July, 2019

(Sridhara, S.)

Major Advisor

2. Influence of Foliar Application of Water Soluble Fertilizers on Growth and Yield of Green Gram (Vigna radiata L.)

(BHAVYA, M.)

ABSTRACT

A field experiment was conducted at College of Agriculture,UAHS, Shivamogga during late kharif2018, to study the influence of foliar application of water soluble fertilizers on growth and yield of green gram. The texture of the soil was sandy loam having acidic pH (6.19) withorganic carbon of 4.56 g kg-1, available nitrogen 240.32 kg ha-1, available phosphorous 76.09 kg ha-1 and potassium 136.73 kg ha-1. The variety used was KKM-3. The experiment was laid out in a Randomized Complete Block Design with thirteen treatments replicatedthrice. The treatments comprised of water soluble fertilizers (viz., 2 % DAP, 1 % 19:19:19, 2 % 19:19:19, 1 % monopotassium phosphate, 2 % monopotassium phosphate,) along with package of practice.

Among different treatment combinations foliar application of monopotassium phosphate and 19:19:19 each @ 1 per cent at 30 and 45 DAS along with package of practice recorded significantly higherplant height (56.04 cm), number of leaves plant-1 (8.46), leaf area (5.37 dm2 plant-1), total dry matter production (22.16 g plant-1), number of pods plant-1 (22.10), number of seeds pod-1 (12.65), pod length (8.92 cm), seed yield (1038.82 kg ha-1) and haulm yield (1675.28 kg ha-1) and the same treatment recorded significantly higher total nutrient uptake of nitrogen (67.90 kg ha-1), phosphorus (5.69 kg ha-1), potassium (60.75 kg ha-1). The yield increment was 25.07 per centover the package of practice

Higher gross return (` 76470 ha-1) and net returns (` 49020 ha-1) were registered with foliar application of monopotassium phosphate and 19:19:19 each @ 1 per cent at 30 and 45 DAS along with package of practice whereas, higher B: C (2.84) was obtained with foliar application of monopotassium phosphate and 19:19:19 each @ 1 per cent at 30 DAS along with package of practice.

August, 2019

(C. J. Sridhara)
Major Advisor

3. Effect of Integrated Nutrient Management in Direct Seeded Rice (Oryza sativa L.) in Southern Transitional Zone of Karnataka

(HANAMANT S HARIJAN)

ABSTRACT

A field experiment was conducted at Agricultural and Horticultural Research Station, Bhavikere, UAHS, Shivamogga during Kharif 2018, to study the Effect of Integrated Nutrient Management in Direct Seeded Rice (Oryza sativa L.) in Southern Transiitional Zone of Karnataka. The texture of the soil was Sandy loam and having acidic pH with low organic carbon and available nitrogen. Available Phosporous and potassium were medium. The variety used was Jyothi. The experiment was laid out in Randomized complete block design with nine treatments and three replications. The combination of treatment are 100% RDF, 75 % RDF with different nutrient sources like FYM, PGPR and 20:20:20 water soluble fertilizer (1% spray at 30 and 60 DAS)

Among the different treatment combination application of 100%RDF + FYM (10 t ha-1) +PGPR + 20:20:20 Water soluble fertilizers gave significantly higher growth parameters like more number of leaves plant-1 (108.42), more number of tillers plant-1(22.56), higher the leaf area(798.33 cm2), more total dry matter production (80.23g) and yield parameters like more number of paniclesplant-1(17.18), panicle weight (3.20 g), test weight (24.65 g), more number of filled grains (104.20),higher grain yield (4916.67 Kg ha-1), higher straw yield (5476.67 Kg ha-1) and more harvest index (0.48) as compared to other treatments and total nutrient uptake of nitrogen (137.38Kg ha-1), phosphorus (28.83Kg ha-1) and potassium (118.17Kg ha-1). The control plot will gave lesser growth parameters and yield parameters as compared to rest of the treatments.

Higher gross returns(Rs.100560) were registered with 100%RDF + FYM+PGPR + 20:20:20 Water soluble fertilizers whereas, higher net returns(Rs.61550) and benefit cost ratio (2.68) was obtained with application of 75% RDF + FYM + PGPR + 20:20:20 water soluble fertilizers.

August, 2019

(Narayana S Mavarkar)
Major Advisor

4. Conjunctive Use of Sewage and Irrigable Water on Performance of Groundnut (Arachis hypogaeal.) and Soil Properties

(NISCHITHA D GOWDA)

ABSTRACT

A field experiment to study the "Conjunctive use of sewage and irrigable water on performance of groundnut (Arachis hypogaea L.) and soil properties" was carried out at College of Agriculture, Shivamogga under irrigated condition during summer 2018. The experiment was laid out under randomized complete block design with nine treatments replicated thrice. Irrigable water, treated sewage water and untreated sewage water alone and in conjunctive mode in different proportion of 1:1, 2:1 and 1:2 were used as treatments.Irrigation with untreated sewage water alone has recorded significantly higher pod yield (2534kg ha-1), oil yield (893.11kg ha-1), protein content (25.73 %) of groundnut along with increased available nutrient status in the soil (296.16, 84.13, 128.84 kg NPK ha-1). Among the conjunctive mode one irrigation with irrigable water fb two irrigations with untreated sewage water and irrigation alternatively with irrigable water and untreated sewage water have recorded higher pod yield (2489 and 2442kg ha-1), oil yield (843.14 and 807.51kg ha-1), protein content (25.57 and 25.27 %) respectively, along with increased nutrients availability in soil (292.75, 83.01, 128.23 and 291.91, 81.66, 127.09 kgNPK ha-1).Highest gross returns (₹ 1,00,360`ha-1), net returns (₹ 70,933 ha-1) and B:C ratio (3.41) were realized by irrigating with untreated sewage water alone. Sewage water containing toxic substances, heavy metals and harmful microorganisms within the permissible limit can be used safely for irrigating crops like groundnut.

August, 2019

(G.K. Girijesh)
Major Advisor

5. **Economic Feasibility of Sewage Water on Soil Properties and Productivity of Okra [Abelmoschus esculentus (L.) Moench]**

(POOJA, C. A.)

ABSTRACT

A field experiment was conducted during summer 2018 at Agronomy field unit, College of Agriculture, Shivamogga. The experiment was laid out in Randomized Complete Block Design with 10 treatments replicated thrice. The soil of the experimental site was acidic in reaction, low in available nitrogen, medium status with respect to available phosphorus and potassium. The test variety was 'Arka Anamika'. The treatments comprised of different sources of water viz., normal water (NW), treated sewage water (TSW) and untreated sewage water (UTSW) alone and in conjunctive mode.

The chemical characteristics of different sources of water used were within the standards except N, P and K. Due to richness of nutrients, TSW added higher amounts of available N (43.56 kg ha-1), available P2O5(82.46 kg ha-1) and available K2O (68.19 kg ha-1) followed by UTSW. Soils being a good bio filter, the impacts of salts and nutrients added were meager.

Among the different treatments, application of treated sewage water performed better for growth and yield components. It recorded higher number of branches (4.47 plant-1), total dry matter accumulation (125.12 g plant-1), number of fruits plant-1 (71.83), fruit yield (32.35 t ha-1). This was seconded by application of one time normal water fb two times treated sewage water (29.24 t ha-1). Plots receiving UTSW yielded 16 and 49 per cent lesser than NW and TSW application. Net returns (3,23,200) of treatment receiving treated sewage water was found highest with B: C (2.99).

August, 2019

(M. Dinesh Kumar)

Major Advisor

6. Response of Rice (Oryza sativa L.) to Humic Acid and Graded Levels of Fertilizers in Coastal Zone of Karnataka

(SACHIN K H)

ABSTRACT

A Field experiment was conductedat Zonal Agricultural and Horticultural Research Station, Brahmavar, Udupi, Karnataka coming under University of Agricultural and Horticulture Sciences, Shivamogga to evaluate the response of rice to humic acid and graded levels of fertilizers in Coastal Zone of Karnatakaduringkharif season of 2018. The experiment was laid out in Randomized Complete Block Design consisting of twelve treatment combinations and replicated thrice having three levels ofhumic acid and graded levels fertilizers viz.,75% RDF (T1), 100%RDF (CHECK,T2), 125% RDF (T3), T1+ humic acid @ 2.5 kg ha-1(T4), T1+ humic acid @ 5 kg ha-1 (T5), T1+ humic acid @7.5 kg ha-1(T6), T2+ humic acid @ 2.5 kg ha-1 (T7), T2+ humic acid @ 5 kg ha-1 (T8), T2+ humic acid @ 7.5 kg ha-1 (T9), T3+ humic acid @ 2.5 kg ha-1(T10), T3+ humic acid @ 5 kg ha-1(T11), T3 + humic acid @ 7.5 kg ha-1(T12).

The results revealed that application of 125 per cent RDF + humic acid at 7.5 kg ha- produced significantly higher grain and straw yield (5480 and 6452 kg ha-1, respectively) as compared to recommended dose of fertilizers alone (4508 and 5506 kg ha-1, respectively). The same treatment combination recorded significantly higher plant height (98.72 cm), number of tillers per hill (19.72), number of green leaves per hill (9.43), total dry matter production (61.32 g hill-1) at harvest and yield attributing characters like number of productive tillers per hill (16.71), panicle length (22.80 cm), panicle weight (4.47 g per panicle), number of filled grains per panicle (111), harvest index (0.45) and total nutrient uptake of NPK (112.79, 47.60, and 72.16 kg ha-1, respectively) with higher net returns (Rs.61.434 ha-1) and benefit cost ratio (2.25) followed by 100 per cent RDF + humic acid at 7.5 kg ha-1.

August, 2019

(K. V. Sudhir Kamath)

Major Advisor

7. Studies on Integrated Nutrient Management in Paddy (Oryza sativa L.) under Hilly Zone of Karnataka

(SHREESHAIL)

ABSTRACT

A field experiment was conducted at Zonal Agricultural and Horticultural Research Station, Mudigere, Chikkamagaluru district, Karnataka to investigate the integrated nutrient management in paddy under hilly zone of Karnataka during kharif season of 2018. The experiment was laid out in Randomized Complete Block Design consisting of ten treatments and replicated thrice. The treatment combination includes T1- 100% RDF, T2- 100% RDF + FYM, T3- 100% RDF + Glyricidia equivalent to FYM, T4- 100% RDF + Eupatorium equivalent to FYM, T5- 100% RDF + FYM + PGPR, T6- 100 % RDF + Glyricidia+ PGPR, T7– 100% RDF + Eupatorium+ PGPR, T8- 100% RDF + PGPR, T9- 100% RDF + Glyricidia (50%) + Eupatorium (50%) + PGPR and T10- 100% RDF + Glyricidia (50%) + Eupatorium (50%). The organic manures were incorporated in soil 25 days before transplanting of paddy.

The result revealed that application of 100% RDF + Glyricidia (50%) + Eupatorium (50%) + PGPR (T9) recorded significantly higher plant height (99.06 cm), number of tillers per hill (20.37), total dry matter production (72.60 g hill-1) at harvest and yield attributing characters like number of productive tillers per hill (18.41), panicle length (22.29 cm), panicle weight (4.13 g panicle-1), number of filled grains per panicle (128) and total nutrient uptake of NPK (110.81, 48.47 and 61.55 kg ha-1, respectively) as compared to recommended dose of fertilizers alone (4952 and 6293 kg ha-1, respectively).

Significantly higher grain and straw yield (5843 and 7477 kg ha-1, respectively) was recorded with application of 100% RDF + Glyricidia (50%) + Eupatorium (50%) + PGPR 100% RDF + Glyricidia (50%) + Eupatorium (50%) + PGPR (T9). The same treatment combination recorded higher net returns (Rs.64.844 ha-1) and benefit cost ratio (2.11) followed by 100% RDF + Glyricidia + PGPR (T6) over other treatment combinations.

August, 2019

(M. Hanumanthappa)

Major Advisor

8. Performance of Ragi (Eleusine coracana G.) Varieties under Different Sowing Dates in Southern Transition Zone of Karnataka

(YALLAPPA B DONI)

ABSTRACT

A field experiment was conducted at Agricultural and Horticultural Research Station,Bavikere, UAHS, Shivamogga to study the Performance of Ragi (Eleusinecoracana G.) varieties under different sowing dates in Southern Transition Zone of Karnataka under rainfed condition during Kharif 2018. The experiment was laid out in Factorial Randomized Block Design with three replications. There were 12 treatment combinations comprised of four sowing dates under different fortnight intervals (July 2nd fortnight, August 1st fortnight, August 2nd fortnight and September 1st fortnight) and three varieties (GPU-48, ML-365 and KMR-301).

Among the different dates of sowing crop sown during July 2nd fortnightrecorded significantly taller plants (96.48 cm), leaf area (904.57 cm2 plant-1), total dry matter accumulation (31.27 g plant-1), number of ear heads per plant (2.93), number of fingers per ear head (6.59), grain weight per ear head (4.74 g), grain yield (2886 kg ha-1), and straw yield (5754 kg ha-1). Among the varieties, KMR-301 recorded significantly taller plants (94.17 cm), leaf area (760.85 cm2 plant-1), total dry matter accumulation (26.48g plant-1), number of ear heads per plant (3.13), number of fingers per ear head (6.90), grain weight per ear head (3.97 g), grain yield (2425 kgha-1), and straw yield (4860 kg ha-1). Hence, for achieving higher yield in finger millet the best sowing datefound to be July 2nd fortnightfor KMR-301variety.

August, 2019 (Sunil C)

Major Advisor

9. Weed Management in Direct Seeded Rice (Oryza Sativa L.) under Bhadra Command Area of Karnataka

(ABHISHEK GOWDA, C. S.)

ABSTRACT

A field experiment entitled "Weed Management in Direct Seeded Rice (Oryza sativa L.) under bhadra command area of Karnataka" was conducted during kharif 2018 in Agricultural and Horticultural Research Station, Kathalagere with twelve treatments combination viz., inter cultivation, pre-emergent (pre em.) herbicides viz., pretilachlor 30.7 EC, pendimethalin 38.7 CS, oxadiargyl 80% WP and post-emergent (Post em.,) herbicides viz, bispyribac sodium 10% SC, chlorimuron ethyl + metsulfuron methyl 20 WP and Ethoxysulfuron 15 WDG.Four hand weeding practices at 15 days interval and weedy check were included and the experiment was laid out in RCBD with three replication.The predominant weed flora observed in the experimental site were Grasses like Echinocloacrusgalli, Echinochloacolonum,Digitariasanguinalis, Sedges likeCyperusrotundus, Cyperusiria,and broad leaf weeds likeDigera arvensis, Physallis minima.The experimental results revealed thatInter cultivation fb Hand weeding at 20 and 40 DAS recorded lower weed population, weed dry weight, weed index (1.81) and higher weed control efficiency (76.89 to 89.29 %). The same treatment combination recorded higher growth and growth attributes. Higher grain yield (5212 kg ha-1), straw yield (5928 kg ha-1) and major nutrients uptake by crop also recorded in above mentioned treatment. These results are on par with inter-cultivation at 20 DAS fbbispyribac sodium10 % SC @ 20 g a.i ha-1. Among herbicide combination treatments, pendimethalin 38.7 CS @0.75 kg a.i ha-1(Pre. em.) fbbispyribac sodium 10% SC @ 20 g a.i ha-1(Post. em.) recorded higher growth and yield attributes without being phytotoxic to the crop.The maximum B:C ratio (2.82) was achieved in treatment Pretilachlor 30.7 EC @ 0.3 kga.i ha-1 with safener (Pre. em.) fb inter-cultivation at 40 DAS. Theirwas no residual effect of herbicides on soil microbial population and succeeding crop.

September, 2019

(Kumara, O.)

Major Advisor

Genetics and Plant Breeding

University of Agricultural and Horticultural Sciences, Shivamogga

M. Sc. (Agri.) theses abstracts produced in the

Department of Genetics and Plant Breeding

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1. Genetic Variability and Molecular Diversity in Groundnut (Arachis hypogaea L.,) for Aspergillus flavus Seed Colonization and Aflatoxin Contamination

(Hasanali Nadaf)

ABSTRACT

In recent times, edible groundnuts have attracted major attention in the international market. Aflatoxin contamination and pesticide residues are the major obstacles in its export. Hence, development of cultivars with resistance to seed colonization by Aspergillus flavus and aflatoxin contamination is a major objective in groundnut breeding. In the present investigation, significant differences were noticed among 66 groundnut genotypes for in vitro seed colonization by A. flavus (IVSCAF), aflatoxin contamination, yield and its component traits (under both normal moisture and moisture stress condition). Yield traits viz., number of primary branches per plant, pod yield (kg/ha) and kernel yield (kg/ha) have exhibited high heritability coupled with high genetic advance over mean indicating better scope for selection for these traits. The genotypes SB-T10, ICGV-15138 and ICGV-15124 have shown high level of resistance to Aspergillus seed colonization. Popular cultivars TMV-2 and GPBD-4 were susceptible to seed colonization. The present study revealed an increase in aflatoxin contamination under moisture stress as compared to normal moisture condition. Genotypes viz., ICGV-15119, Dh-234, Dh-246, Dh-216, Dh-101, Dh-86, K-9, SB-T13, SB-T14, VB-T31, SB-T2 and J-11 have recorded no aflatoxin contamination under both normal moisture and moisture stress conditions indicating their tolerance to aflatoxin contamination. The molecular diversity analysis with 30 SSR primers revealed that, germplasm lineICGV 15143and cultivar Dh-101 were found to be most divergent genotypes. Single marker analysis has revealed that, marker S-21, S-80 and GM-1954 have significant association with tolerance to aflatoxin contamination. Four markers viz., GM-1954, GM-1883, pPGPseq2F05 and S-03 were linked to IVSCAF. The marker GM-1954 was found to be associated with tolerance to both aflatoxin contamination and in-vitro seed colonization by Aspergillus flavus.

January, 2019

(Dr. Harish Babu B N)
Major Advisor

2. Genetic Analysis in Segregating Population of Okra [Abelmoschus esculentus (L.) Moench] for Yield and its Related Traits

(PRIYANKA, S. R.)

ABSTRACT

The present investigation was aimed to assess the extent of genetic variability, character association, path analysis and identification of transgressive segregsnts in F2 population of cross Phule Utkarshi × ArkaAnamika along with the parents as checks.This study was carried out at the ZAHRS Navile,Shivamogga during Kharif-2018.Theanalysis of variance revealed that existence of significant amount of variability for all the traits studied in the segregating population. Highphenotypic coefficient of variation(PCV) and genotypic coefficient of variation (GCV) were observed for number of branches per plant, number of fruits per plant, fruit weight, number of seeds per fruits, number of picking and yield per plant.High heritability coupled with high genetic advance as percent mean was observed for traits like plant height at maturity, number of fruits per plant, fruit weight, fruit width, fruit length, number of seeds per fruit, number of picking and yield per plant. The highest positive and significant correlation coefficient of yield per plant has been noted with plant height at maturity, number of branches per plant, number of internodes, number of fruits per plant, fruit weight, fruit width, fruit length, number of seeds per fruits and number of picking,indicating that these are the primary yield determinant characters in okra. Path coefficient analysis revealed that number of fruits per plant had highest positive direct effect followed by fruit weight. Thus selection for number of fruits per plant and fruit weight traits might be rewarding. Among the studied population,identified superior transgressive segregantsviz., P-137, P-144, P-147, P-28, P-129, P-68, P-145, P-67, P-115, P-233, P-243, P-27, P-132, P-186 and P-14, for higher yield can be tested across location.

August, 2019

(T. H.Gowda)
Major Advisor

3. Assessment of Genetic Variability in Segregating Population (F2) of Cherry Tomato (Solanum lycopersicum L. var. cerasiforme).

RAJESHWARI, TELI, A.

ABSTRACT

The present investigationwas carried out to assess the extent of genetic variability and identification of transgressive segregants in segregating (F2) population (250) of cross IIHR 2358 (Tomato) and Australian red (cherry tomato) for yield and quality traits. The experiment was undertaken at ZAHRSNavile, Shivamogga during Kharif-2018.Genetic variability analysis showed that existence of sufficient amount of variability formost of the traits. High estimates of phenotypic coefficient of variation (PCV) and genotypic coefficient of variation (GCV) were observed for number of cluster per plant, number of flowers per plant, number of fruits per plant, primary branches per plant, pericarp thickness(mm) and lycopene content (mg/100g). The estimates of heritability and GAM were high for all studied traits except for days to first flowering, number of locules per fruit, TSS (Brix) and pulp content (%). Correlation analysis revealed fruit yield per plant had significant and positive association with number of clusters per plant, number of fruits per plant, plant height (cm), number of branches, average fruit weight (g) and fruit width (mm). Path coefficient analysis had showed positive direct effect of fruit yield on number of clusters per plant, plant height (cm), number of branches per plant, average fruit weight (g)and fruit width (mm).Among the 250 F2 plants P-165, P-128, P-168, P-59, P-17, P-03, P-64, P-48, P-18 and P-41identified superior transgressive segregantscan be evaluated for further advanced to stabilization and can be used as parents in hybridization programmefor yield and quality traits.

August, 2019

(Gangaprasad S.)
Major Advisor

4. Genetic and Morphophysiological Studies for Submergence Tolerance in Rice Landraces (Oryza sativa L.)

(RANJITHA G. V.)

ABSTRACT

The present investigation was carried out at Zonal Agricultural and Horticultural Research Station, Navile, Shivamogga. 100 rice landraces including four checks Viz.,FR13A, Hemavathi, Tunga and Jyothi constituted the experimental material and were laid out in augmented design to screen for submergence tolerance during summer 2018. 46 rice landraces showing more than 50 per cent survival and four checks were selected and further evaluated for morphophysiological traits, genetic diversity and variability for thirteenyield and yield related traits using Randomized Complete Block Design during Kharif 2018. Analysis of variance revealed significant differences among the landraces for all the traits. Physiological traits like survival per cent, chlorophyll content, absolute growth rate and harvest index had significant positive correlation with grain yield per plant.Whereas stem elongation showed negative correlation with grain yield per plant. High GCV and PCV coupled with high heritability and genetic advance as per cent mean was recorded in number of tillers per plant, number of productive tillers per plant, plant height, spikelet fertility, 1000 grain weight, harvest index and grain yield per plant. Correlation studies showed that panicle length, spikelet fertility, 1000 grain weight and harvest index had significant positive correlation with grain yield per plant. Mahalanobis D2statistics grouped the 46 landraces and four checks into eight clusters. The maximum inter cluster distance was found between cluster V and cluster VIII.Molecular diversity analysis using six SSR markers showed the presence of high molecular diversity among landraces grouping them into seven clusters. Landraces such as Halagabatta, Kangalli, Shasti, Guddapairnel andmuttinasannaare identified as submergence tolerantand can be further utilized in crop improvement programme.

August, 2019

(Dushyantha Kumar, B.M.)
Major Advisor

5. Assessment of Genetic Variability in F2 Tomato Population of cross, IIHR 2373 × Arka alok (Lycopersicon esculentum L.)

SANGAMESH

ABSTRACT

The present investigation in tomato (Solanum lycopersicon L.) was undertaken during Kharif, 2018 at Zonal Agricultural Horticultural Research Station, Navile, UAHS, Shivamogga, to study variability parameters, correlation, path analysis and identification of transgressive segregants in respect to fruit yield and its component traits in F2 population of the cross, IIHR-2373 (high shelf life) and Arka Alok (high yield). The distribution pattern indicated large number of genes with dominance based complementary interaction in the inheritance of plant height, number of branches, fruit length, fruit weight, shelf life and fruit yield per plant and duplicate type of interaction was noticed for pH content and days to first flowering. Variability analysis showed the presence of sufficient amount of variability among all the traits studied in the segregating population. Very little differences were observed between GCV and PCV for all the characters except days to first flowering and number of fruit per cluster indicating that most of the traits were less influenced by environmental factors for their phenotypic expression. High heritability coupled with high genetic advance as per cent mean was observed for all the traits except fruit diameter, days to first flowering and number of fruits per cluster indicating wide scope for improvement through selection most of these traits. The highest positive and significant correlation coefficient of fruit yield per plant was noted with plant height, fruit length, fruit diameter and average fruit weight. Path coefficient analysis revealed that average fruit weight had highest positive direct effect followed by plant height, indicating that these are the most important character contributing towards fruit yield. Superior transgressive genotypes (P-34, P-12, P-180, P-127, P-227, P-212, P-157, P-237, P-66 and P-47) that exhibited higher fruit yield per plant with extended shelf life were identified in the cross for advancing to the next generation.

August, 2019

(Gangaprasad S.)
Major Advisor

6. Identification and Characterization of Rice Genotypes (Oryza sativa L.) for Salinity Tolerance

(Sravya, P. K.)

ABSTRACT

The present investigation was carried out in farmer's field at Thyavanige village of Davanagere district. Sixty rice genotypes including four checksviz.,Pokkali, CSR 27, CSR 36 and Jyothi were screened for salinity tolerance using randomized complete block design with two replications during Kharif 2018. Most of the plants of highly sensitive genotypes were died in visual scoring of genotypes for salt injury based on Standard Evaluation System at seedling stage. The remaining fifty four genotypes were studied for yield and yield attributing traits under saline condition. The analysis of variance revealed highly significant difference among genotypes for all the characters studied. High heritability and high genetic advance as per cent mean along with high to moderate GCV and PCV were noticed for days to fifty per cent flowering, number of filled grains per panicle, spikelets per panicle, spikelet fertility, plant height, grain yield per plant, number of tillers per plant, L/B ratio, test weight and productive tillers per plant. The correlation analysis revealed that, the characters viz., total number of tillers per plant, number of productive tillers per plant, number of filled grains per panicle, number of spikelets per panicle, spikelet fertility, test weight, chlorophyll content and L/B ratio had significant positive association with grain yield. The highest direct positive effect on yield was exhibited by number of filled grains per panicle followed by total number of tillers per plant. The Mahalanobis' D2 analysis grouped the genotypes into eight clusters. The maximum inter cluster distance was noticed between cluster III and cluster VIII. Seven SSR markers revealed the presence of high molecular diversity among the genotypes grouping them into seven clusters. The present study showed that the genotypes Marnavamidoddiga, Shivadappavalya, Tulasoimog, Gulvadisannakki, and Kavalakannu are salinity tolerant genotypes and could be further used in salinity tolerance introgression breeding program.

August, 2019 (C. Malleshappa)

Major Advisor

7. Assessment of Morphological Characteristics and Genetic Variability Studies in Landraces of Rice (Oryza sativa L.)

(SUJATA)

ABSTRACT

Present investigation was carried out to characterize 51 landraces of rice at Zonal Agricultural and Horticultural Research Station, Shivamogga, during the Kharif2018, Shivamogga using Randomized complete block Design. Forty one qualitative and thirteenquantitative characters were evaluated as per DUS guidelines given by PPV and FRA, 2001. Five characters such as the presence of leaf ligule, split shape of leaf ligule, absence of male sterility and presence of secondary branching characters were common in all the 51 landraces of rice. Remaining 36 characters were unique and distinct among the landraces of rice. Analysis of variance revealed a significant difference for all the characters. The high GCV, PCV and heritability with maximum genetic advance per cent mean was recorded for days to 50 per cent flowering, days to maturity, leaf length, stem thickness, plant height, total number of tillers per plant, number of productivetillers per plantand test weight.Correlation analysis revealed that traits viz.,total number of tillers per plant, number of productive tillers per plant, test weight, panicle length and panicle fertility showed significant positive correlation with grain yield per plant. Path analysis revealed that days to 50 per cent flowering, leaf width, the total number of tillers per plant, number of productive tillers per plant, panicle length and test weight showed a direct and positive effect on yield.Mahalanobis' D2clustered the landraces of rice into eight clusters, cluster IV and cluster V showed highest inter-cluster distance. The study will be useful for breeders, researchers and farmers to identify and choose the restoration and conservation of beneficial genes for crop improvement and also to seek protection under Protection of Plant Varieties and Farmer's Rights Act, 2001.

August, 2019

(Shridevi A. Jakkeral)

Major Advisor

8. Assessment of Genetic Variability and Diversity in Advanced Breeding Lines of Rice (Oryza sativa L.)

(Supriya, R. V.)

ABSTRACT

The present investigation was carried out at Zonal Agricultural and Horticultural Research Station, Navile, Shivamogga during kharif 2018. Forty advanced breeding lines of F4 generation with four checks viz., KMLT-4, JGL-1798, KPR2 and JYOTHI constituted the experimental material and were laid out in Randomized Complete Block Design to study genetic variability, diversity, character association and path analysis for fourteen yield and yield attributing traits. The analysis of variance revealed significant differences among the advanced breeding lines for all the characters studied. High GCV and PCV coupled with high heritability and GAM was recorded for number of productive tillers per plant, number of spikelets per panicle, number of filled grains per panicle and straw yield per plant. Correlation studies revealed that days to 50 per cent flowering, number of tillers per plant, number of productive tillers per plant, number of spikelets per panicle, number of filled grains per panicle, spikelet fertility, test weight and harvest index had significant positive correlation with grain yield per plant. The highest direct positive effect on grain yield per plant was exhibited by straw yield per plant followed by harvest index. Mahalanobis' D2 statistics grouped the forty advanced breeding lines and four checks into seven clusters. The maximum inter cluster distance was recorded between clusters IV and VII.The maximum per cent contribution towards divergence was made by days to fifty per cent flowering and number of spikelets per panicle. The advanced breeding linesviz., KMLT-4 x KPR2 1-4-1-3, KMLT-4 x KPR2 2-15-1, KMLT-4 x KPR2 2-12-1, JGL 1798 x KPR2 1-8-6-1, JGL 1798 x KPR2 2-2-1-1, JGL 1798 x KPR2 2-2-3-2, KPR2 x JYOTHI 1-4-3-1 and KPR2 x JYOTHI 3-9-4-1 exhibited higher mean yield performance compare to the checks. Hence these lines should be advanced to next generation and evaluated for stability and adaptability.

August, 2019

(Dushyantha Kumar, B. M.)

Major Advisor

Plant Pathology

University of Agricultural and Horticultural Sciences, Shivamogga

M. Sc. (Agri.) theses abstracts produced in the Department of Plant Pathology

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1. Bioefficacy and Shelf Life of Trichoderma spp. against Pythium and Phytophthora spp.

(Pavitra)

ABSTRACT

Trichoderma is an important biocontrol agent plays an important role in managing various soil borne plant parasites. These fungi have been widely studied for their biocontrol activities viz., micoparasitism, antibiosis, competition for nutrient and space, niche exclusion, stress tolerance, induced resistance in plants as well as inactivation of the pathogen's enzymes by producing various antimicrobial compounds. The present study was conducted to study the bioefficacy of three Trichoderma species viz., T. asperillum, T. virens and T. aureoviridae against different plant pathogens, their compatibility of with PGPRs. Apart from that, shelf life of Trichoderma species under different formulations was studied using different carrier materials. Antagonistic effect of all the three Trichoderma species were tested against Pythium myriotylum, Pythium aphanidermatum, Phytophthora capsici, Phytophthora infestans and Phytophthora meadii. Among the three species of Trichoderma tested, Trichoderma virens showed maximum antagonistic effect against all the plant pathogens. Whereas, Trichoderma asperillum and Trichoderma aureoviridae showed moderate antagonistic effect. The antagonistic or inhibitory effect of Trichoderma species was observed more in dual plate and culture filtrate tests compare to invert plate technique under in vitro. Compatibility studies of Trichoderma spp. with other Plant growth promoting rhizobacteria's showed that, Bacillus megaterium, Bacillus mucilogenus showed 100 per cent compatibility with all the three species of Trichoderma. Whereas Azotobacter are moderately compatible and Pseudomonas fluorescens showed least compatible. Shelf life studies of all the three species of Trichoderma on both solid and liquid formulation showed survival capability of the organism in both the conditions. However, the organism showed maximum shelf life in liquid formulation followed by FYM and areca nut husk compost even after eight months of storage. Finger printing of T. virens, was carried out using different SSR markers. Among them SSR- 3 marker found to be the specific genetic marker which showed polymorphic banding pattern.

August, 2019

(B. Gangadhara Naik)
Major Advisor

2. Studies on Brown Spot of Paddy (Oryza sativa. L) Incited by Helminthosporium oryzae

(PrashanthNaik . L.)

ABSTRACT

Rice is the most extensively cultivated food crop of Asia and it is affected by several diseases.TheBrown spot caused by Helminthosporium oryzae is one of the most destructive fungal diseases causing significant yield loss in all the rice growing regions of the world. The present survey conducted for the disease in hilly zones of Karnataka, revealed highest mean disease severity in Kodagu (40.90 %) followed by Shivamogga (17.63 %) and the least mean disease severity (16.22 %) was observed in Chickmagaluru district.Among99 rice genotypes screened, two genotypes (Swardhan and Tetep) were found to be highly resistant,three(IET 26576, IET 27502 and IET 27506) were resistant and nine (IR-64, IET 27507, IET27503, IET 7501, IET 25830,IET 25841,IET 27504,IET 27505 and Ajeya) were moderately resistant. Thirty four genotypes recorded moderately susceptible reaction and anotherthirty four genotypes were shown susceptible reaction. A total of seventeen genotypes were shown highly susceptible reaction.Cultural and morphological studies revealed that radial growth of Helminthosporium oryzae was maximum on potato dextrose agar (76.74 mm). In vitro evaluation of all the fungicidestested were effective in inhibition of pathogen at all the concentrations and maximum inhibition was recorded in Trifloxystrobin + Tebuconazole 89.04 per cent at 100, 250, 500 ppm concentration. The field evaluation of fungicides, revealed that Trifloxystrobin 25% + Tebuconazole 50% WG at 0.4 g/l recorded the least brown spot severity (2.72 %) followed by Carbendazim 50% WP @ 1 g/l (5.50 %) with the highest yield of 53.46 q/ha and 51.75 q/ha, respectively.

August, 2019

(G. N. Hosagoudar)
Major Advisor

3. Studies on Tomato Leaf Curl Virus in Tomato (Lycopersicon esculentum Mill.)

(RAJENDRA SWAMY, S.)

ABSTRACT

Tomato leaf curl disease caused by Tomatoleaf curl virus(ToLCV)is transmitted in nature by the whitefly (Bemisiatabaci)is an economically significant problem due to the potential yield loss it causes.This is becoming a major constraint in tomato cultivation in major tomato growing regions of Karnataka. With this background,the present study was carried out to understand the disease incidence, its distribution along with identification of resistance source, molecular confirmation of the pathogen and to identify the best management practice for the virus and the vector. A roving survey was conducted during 2019(summer) to assess the incidence of leaf curl virus on tomato in Shivamogga, Davanagere and Chikkamagaluru districts of Southern Karnataka. Among the districts surveyed, the highest(70.82%)and the lowest(34.07%) disease incidencewere recorded in Davanagereand Chikkamagaluru districts, respectively.An attempt was made to screen a total of fifty tomato genotypes for resistance, among which none of the linesexpressed highly resistant or resistant reaction and all the genotypes expressed highly susceptible and susceptible reaction to ToLCV.The suspected ToLCVsymptomatic leaf samples collected during the survey were tested for the confirmation of the presence of virus by polymerase chain reaction (PCR)using a set of Begomovirus specific primers P1F (5'-ATGGCGAAGCGACCAGC-3') and P1R (5'-TTAATTTGTTACGCAATCATA-3'). All the samples tested were found positiveto ToLCV with an amplicon size (780bp) aftergel electrophoresis.In a field experiment on management studies, among the different treatments imposed, raising tomato seedlings under nylon nets in nursery followed by four sprays with imidacloprid (0.5ml/ltr) in the field was found to be the best in management of Tomato leaf curl virus (ToLCV) and the whitefly (Bemisiatabaci).

August, 2019

(R. Ganesha Naik)

Major Advisor

4. Studies on Rice Root Knot Nematode, Meloidogyne graminicola Golden and Birchfield

(SACHINGOWDA, S.R.)

ABSTRACT

Rice root knot nematode, Meloidogyne graminicola is the most important pest and is prevalent in major rice producing countries of the world in all types of rice cultivation and is considered as the most havoc problem in Karnataka. Infection by M.graminicola resulted in wide fluctuations in peroxidase (PO) and polyphenol oxidase (PPO) activity in rice plants. In this regard five different rice varieties one moderately resistant (MTU1001),two susceptible (Daksha and IR-64) and two highly susceptible varieties (Jyothi and Raksha) were analyzed for isozyme activity through pot culture experiment. Higher PO and PPO activity was seen in root than in leaves. The maximum PO and PPO activity was found in MTU1001 which was followed by Daksha and IR-64 and the least isozyme activity was observed in Jyothi and Raksha, before inoculation,30,60,90 and at harvest stage after nematode inoculation.In vitro, evaluation of two different nano products AgNP and ZnNPs (100,250,500,750,1000 ppm) against M.graminicola juveniles was carried out.The hundred percentjuvenile mortality was noticed in ZnNPs at all the concentrations and time intervals followed by AgNP which shows hundred per cent juvenile mortality at 750 ppm after 24 hrstime intervals. Molecular characterization of the three populations of M.graminicola isolated from Shivamogga, Mandya and Davanagere districts of Karnataka were taken up. The amplification of 5.8S rRNA gene has been successfully performed. The sequence size of ITS is 790 bp. The strains of Davanagere and Shivamogga shows 93.80 and 98.08% homology with M.graminicola isolate of Hyderabad (MF320121.1) whereas Mandya strain shows 99.75% homology with other isolate of Mandya (MF320123.1).The different treatments tested in in vivo revealed that the least nematode population (275.00),better plant growth (124.36 cm plant height,7.12 g fresh root weight,3.35 g, dry root weight,23.13 cm root length) and maximum yield (44.60 q/ha)in carbofuran 3G alone application followed by consortium of bioagents viz., P. lilacinum + T. harzianum + B. subtilis + B. megatherium + vermicompost.

August, 2019

(H. Ravindra)

Major Advisor

5. Screening of Trichoderma Isolates for their Potential Biosorption of Copper and Iron in Malnad regions of Karnataka

(SAGAR, N.)

ABSTRACT

Trichoderma spp. plays an important role in maintaining ecology by actively participating in decomposition of plant residues, biodegradation of manmade chemicals and bioaccumulation of high amounts of various metals from the soil. Roving survey conducted to collect rhizosphere soil from different taluks of malnad or hilly regions of Karnataka revealed the presence of copper and iron in higher concentration their by creating a toxic soil environment. Biosorption ability of Trichoderma isolates tested under in vitro condition showed excellent mycelial growth at all the concentrations of copper and iron amended PDA (potato dextrose agar) media. Most of the Trichoderma isolates exhibited light green to dark green colony colour while reverse colony colour varied from white to light green. Atomic Absorption Spectrophotometer analysis of absorbed copper and iron in dry mycelia and residual copper and iron in culture broth demonstrated that Tr22 isolate was found to be the most prominent bio-sorbent organism for both copper and iron, followed by other isolates. Under the in vivo condition, the maximum mean Colony Forming Units (CFU's) was recorded with Tr22 at all the concentrations of copper and iron amended to the soil medium, followed by Tr29, Tr14, Tr2 and Tr7 as compared to control. Molecular characterization of Trichoderma isolates revealed that Tr2, Tr7 and Tr29 were identified as T. asperellum, Tr14 as T. asperelloides and Tr22 as T. aureoviride.

August, 2019

(B. Gangadhara Naik)
Major Advisor

6. Investigation on Wilt Complex of Tomato (Solanum lycopersicum L.)

(SANDEEP RAMESH KAMATAGI)

Abstract

The present investigations were carried out on 'Investigation on wilt complex of tomato (Solanum lycopersicum L.) during 2018-2019 at Univarsity of Agricultural and Horticultural Sciences, Shivamogga.The disease wasnoticed in all the surveyed locations of Shivamogga and Davanagere districts during 2018-19. The severity of disease complex was more in Honnalli taluk of Davanagere district (31.09%) followed Davanagere taluk (22.29 %) and minimum disease incidence was recorded in Badravati taluk (14.44%). In the interaction studies among the individual pathogen inoculation, Ralstonia solanacearum was most aggressive pathogen, followed by Fusarium oxysporum f. sp. lycopersici and Meloidogyne incognita. In simultaneous inoculation of all the three pathogens which caused more damage than any of the other combination of pathogen and caused early wilting symptoms and reduction in plant growth. These results indicate that the nematode can predispose tomato to infection by F.oxysporum f. sp. lycopersici and R.solanacearum. In vitro evaluation of zinc and chitosan based silver nanoparticles against tomato wilt pathogens showed that, zinc nanoparticle was more effective at 1500 ppm concentration against F. oxysporum (97.03 %) compared to silver nano particle at 1500 ppm (12.22 %). In case of R. Solanacearum, silver nanoparticle was more effective at 750 ppm (24.00%) compared to zinc nanoparticle at 1500 ppm (22.33 %) and with respect toM. incognita, zinc nanoparticle showed hundred per cent juvenile mortality in all thetested concentrations as compared to silver nanoparticle.

August, 2019

(H. Ravindra)

Major Advisor

7. Detection, Host Resistance and Management of Leaf curl Disease of Tobacco (Nicotiana tabacum L.)

(SUNITA ANKALAKOTI)

ABSTRACT

Tobacco leaf curl disease caused by Tobacco leaf curl virus (TLCV) is an economically important disease which limits the crop growth and yield. TLCV belongs to Begomo virus which is transmitted by whitefly (Bemisia tabaci) in a persistent manner. Among major diseases occurring on tobacco, TLCV is one of the most common and serious problem in Karnataka. The present study was conducted to know the hot spots and distribution of the disease, resistance source and the best management practice against the disease as well as vector. Roving survey was conducted duringKharif2018 to assess the leaf curl disease incidence in major tobacco growing areas viz., Mysuru, Hassan, Davangere and Shivamogga district, revealed the occurrence of disease in the range of 10.17 to 43.50 per cent. Among the districts surveyed, the highest disease incidence of 40.12 % and lowest incidence of 12.30 % were recorded in Mysore district and Davangere district respectively. Twenty eight genotypes were screened under field conditions against TLCV revealed that the seven genotypes viz., FCJ-27, FCJ-28, FCK-7,FCR-50, FCR-63, FCJ-35 and Tobios-6 were showed resistant (R) reaction with disease incidence from 0.10 to 5.0 per cent. Suspected TLCV infected samples collected from surveyed areas were tested by PCR using coat protein (CP) specific primers, which amplified 780 bp. The sequence of CP of TLCV-SSN shared nucleotide identity of 96.66 per cent with Chilli leaf curl multan virus (HM007100.1) and 88.07 per cent similarity with Tobacco leaf curl virus (AY007615.1).Management of TLCV and its vector under field condition using different insecticides and biorationals revealed that, the seedling dip in imidacloprid (0.5 ml/ lt) and spraying with acetamiprid (0.3 g/ lt) three times at ten days interval gave least disease incidence (18.12 %), whitefly population (0.22plant-1) and highest yield (Green leaf yield of 10968.99 kg ha-1 and cured leaf yield of 1520.10 kg ha-1) respectively.

August, 2019

(R. Ganesha Naik)

Major Advisor

8. Host Resistance, Detection and Management of *Mungbean Yellow Mosaic Virus* in Mungbean (*Vigna radiata* L.)

(SOFI SHARMATH)

ABSTRACT

Mungbean yellow mosaic disease caused by *Mungbean yellow mosaic virus* (MYMV) is an economically important disease which limits the crop growth and yield. MYMV belongs to Begomovirus which is transmitted by whitefly (*Bemisia tabaci*) in a persistent manner. Among major diseases occurring on mungbean, MYMV is one of the most common and serious problem in Karnataka. The present study was conducted to know the hotspots and prevalence of the disease in four districts of Karnataka, resistance source and the best management practice against the disease as well as vector. Roving survey was conducted during Summer 2020 to assess the mungbean yellow mosaic disease incidence in Chikkamagaluru, Chitradurga, Davanagere and Shivamogga district, revealed the occurrence of disease in the range of 6.80 to 58.18 per cent. Among the districts surveyed, the highest disease incidence of 38.14 per cent and lowest incidence of 17.11 per cent were recorded in Chitradurga district and Shivamogga district respectively. Thirty one genotypes were screened under field conditions against MYMV, revealed that the seven genotypes *viz.*,GG-3, GPB-G-10, K4, MLS, KM-17-185, KM-17-196 and UAHS Bold were showed moderately resistant (MR) reaction with disease incidence from 10.57 to 19.86 per cent. Suspected MYMV infected samples collected from surveyed areas were tested by PCR using coat protein (CP) specific primers, which amplified 900bp. Management of MYMV and its vector under field condition using different insecticides and biorationals revealed that, seed treatment + spraying with imidacloprid (1 ml/ l) three times at ten days interval gave significantly less disease incidence (35.67 %), whitefly population (3.46 plant^{-1}) and highest grain yield (990.50 kg ha^{-1}).

September, 2019

(R. Ganesha Naik)

Major Advisor

Soil Science and Agricultural Chemistry

University of Agricultural and Horticultural Sciences, Shivamogga

M. Sc. (Agri.) theses abstracts produced in the

Department of Soil Science and Agricultural Chemistry

1. Effect of Biochar on Soil Physical Properties, Carbon Pools and Productivity of Maize (Zea mays L.)

(SHILPA, P. V.)

ABSTRACT

A field experiment was conducted at Agricultural and Horticultural Research Station, Bavikere, UAHS, Shivamogga during the year 2018, to know the "Effect of biochar on soil physical properties, carbon pools and productivity of maize (Zea mays L.)". Two levels of cob rind biochar combination with and without three levels of FYM was applied to field. The experiment was laid out in a Randomized Complete Block Design with nine treatments and replicated thrice. The result revealed that application of higher level of biochar 4 t ha-1 + 100 per cent RD-FYM + RDF, significantly increased the water holding capacity (37.41%) and porosity (32.93%) of soil compared to control treatment received RDF + RD- FYM.

Increase in soil pH and electrical conductivity was observed with the application of biochar at 4 t ha-1 + 50 per cent FYM + RDF. But soil application of biochar at 4 t ha-1 + 100 per cent FYM + RDFrecorded significantly higher soil carbon pools like PDOC (10.89 g kg-1),PPOC (494.01 mg kg-1), MBC (365.77 mg kg-1), CWEC (160.64 mg kg-1), TOC (11.17 g kg-1), TIC (0.82g kg-1) and TC (11.99 g kg-1), soil available nutrients like nitrogen (316.10 kg ha-1), phosphorus (55.18kg ha-1) and potassium(253.33kg ha-1), growth and yield parameters likeplant height (182.20 cm), number of leaves (13.56), total dry matter production (295.00 g), grain yield (86.40 q ha-1), stover yield (104.20 q ha-1)and nutrient concentration like nitrogen (1.65 and 1.00 %), phosphorus (0.29 and 0.22 %) and potassium(0.49 and 1.07 %) in grain and stover of maize was observed.

July, 2019

(G. N.Thippeshappa)

Major Advisor

2. Performance of French bean (*Phaseolus vulgaris* L.) as Influenced by Organic Nutrient Management under Rainfed Condition

(GOWTHAMCHAND, N.J.)

ABSTRACT

A field experiment was conductedduring kharif2018-19 at Organic Farming Research Centre, ZonalAgricultural and Horticultural Research Station, UAHS,Shivamogga to study the performance of French bean (phaseolus vulgaris L.) as influenced by organic nutrient management under rainfed condition. The experiment was laid out in Randomized Complete Block Design inten treatments withthree replications. In this investigation, the results revealed that application of Beejamrutha (seed treatment) + Jeevamrutha (soil application @ 500 l ha-1) + 100 % RDN through vermicompost + Foliar spray ofPanchagavya @ 3% recordedhigher green pod (16.43 t ha-1)and haulm yield (2.82 t ha-1) and on par with application of Beejamrutha (seed treatment) + Jeevamrutha (soil application @ 500 l ha-1) + 50 % RDN through FYM + 50 % RDN through FYM + Foliar spray of Panchagavya @ 3%(15.81 and 2.75 t ha-1) and Beejamrutha (seed treatment) + Jeevamrutha (soil application @ 500 l ha-1) + 100 % RDN through vermicompost + Foliar spray of Panchagavya @ 3% (15.42 and 2.60 t ha-1). Lower green pod (8.07 t ha-1) and haulm yield (1.76 t ha-1) was recorded in the treatment which received only Beejamrutha (seed treatment) + Jeevamrutha (soil application @ 500 l ha-1).These treatments also showed similar trend with respect to growth and yieldparameters and also nutrient content and NPK uptake by plants. There was significant improvement in soil available nutrient status, dehydrogenase, phophatase and ureaseactivities at different growth stages of crop. Higher B:C ratio (4.19) was recorded with application of Beejamrutha (seed treatment) + Jeevamrutha (soil application @ 500 l ha-1) + 100 % RDN through FYM + Foliar spray ofPanchagavya @ 3% and lowerB:C ratio (3.36) was observed in the treatment which received only Beejamrutha (seed treatment) + Jeevamrutha (soil application @ 500 l ha-1).

August, 2019

(Ganapathi)
Major Advisor

3. Dynamics of Potassium in Soil under Ragi (*Eleusine coracana* L.) Crop as Influenced by Levels and Split Application of Potassium

(KAVYASHREE, A.N)

ABSTRACT

A field experiment was conducted at Agricultural and Horticultural Research Station, Bavikere, UAHS, Shivamogga during the kharif season of 2018 to know the dynamics of potassium in soil under ragi crop as influenced by levels and split application of potassium. The experiment was laid out in randomized complete block design with nine treatments and replicated thrice. Different levels of potassium @ 18.75, 25, 31.25 and 37.5 kg K2O ha-1 were tried as basal and also in splits. Among the different levels and split application of potassium, the treatment received potassium @ 31.75 kg K2O ha-1 in two splits (15.87 kg K2O ha -1 as basal+ 15.87 kg K2O ha-1 at critical stage) significantly increased the plant height (110.30 cm), number of leaves per plant (32), number of tillers per hill (5.20), finger length (7.24 cm), test weight (3.32 g), straw yield (5851.05 kg ha-1) and grain yield (2596.67kg ha-1) compared to all other treatments except the treatments which received 37.50 kg K2O ha-1 in two splits and lowest growth and yield parameters was observed in treatment without application of potassium.

The uptake of nutrients (N, P, K, Ca, Mg and S) were recorded significantly higher in the treatment which received the potassium level (31.75 kg K2O ha-1) in two splits compared to all other treatments except the treatment which received the potassium level of 37.50 kg K2O ha-1.

An increase in the level of potassium application (18.75 to 37.50 kg K2O ha-1) either as basal or in splits increases the available potassium , water soluble potassium, exchangeable potassium, non- exchangeable potassium and total potassium in soil at harvest of crop. Whereas lattice potassium was decreased with increasing the potassium level of potassium application.

August, 2019

(Chidanandappa, H. M)

Major Advisor

4. Influence of Levelsof Areca Husk Biochar on Carbon Fractions and Growth and Yield of Field Bean (*Dolichus lablab* L.)

(MADHUPRIYA, K.)

ABSTRACT

A field experiment was conducted at Agricultural and Horticultural Research Station (AHRS), Bhavikere, Karnataka, duringRabi 2018 to study the response of fieldbean (Hebbalavare - 4) towards different levels of arecahusk biochar with FYM. Levels of biochar @ 5, 7.5 and 10 t ha-1in combination with100 percent (15 t ha-1) and 75 percent (11.25 t ha-1)recommended FYM were tried in a randomized complete block design with three replications and nine treatments. Results of the experiment revealed that application of high levelof biochar @ 10 t ha-1with 15 t ha-1 FYM significantly increased the growth, yield and yield attributes of field bean. Higher values of nutrient content and uptake by field bean were recorded in the same treatment. The bulk density decreased and maximum water holding capacity, primary nutrients, secondary nutrientsand DTPA extractable micronutrients statusof soil were increased due to application of biochar at 10 t ha-1 with 100 percent recommended FYM. Similar trend was also observed for total carbon, total organic carbon and total inorganic carbonfractionsof soil during the different growth stages of field bean. Positive response for soil enzyme activities such asdehydrogenase, acid phosphatase and urease activity at different growth stages of field bean was noticed with high rate of biochar application and highest values were recorded with treatment receiving biochar@ 10 t ha-1 in combination with FYM @ 15 t ha-1.

August, 2019

(B. C. Dhananjaya)

Major Advisor

5. **Assessment of Soil Organic Carbon Fractions in Soils under Different Land Use Systems of Somawarpettaluk, Kodagu district.**

(SEEMA ANANTARAJJUJIN.)

ABSTRACT

A study was conducted at UAHS, Shivamogga to know the carbon sequestration of soils under different land use systems in Somawarpet taluk, Kodagu district, Karnataka. The one hundred representative soil samples were collected from different land use systems viz., natural forest, sacred groves, coffee based agroforestry-indigenous, coffee based agroforestry-exotic and paddy land use systems at 0-20, 20-40, 40-60 and 60-80 cm soil depths. The present investigation revealed that, texture of the soil is loam to clay loam. The pH was acidic in all the land use systems and electrical conductivity was normal. The highest BD was observed under paddy land use system. The highest mean value of available nitrogen was observed in coffee based agroforestry-indigenous and highest mean value of available phosphorous and available sulphur was observed in natural forest.

Among the different land use systems, the higher mean value of PDOC (18.06 g kg-1), PPOC (292.41 mg kg-1), CWEC (313.98 mg kg-1), SMBC (411.46 mg kg-1), TOC (35.05 g kg-1), and TC (35.43 g kg-1) contents were observed in natural forest and decreases with increasing soil depth. The E4/E6 value was lower than 6 in all the studied land use systems. The soils under natural forest system has recorded the highest mean value of Humic acid (4.87) and Fulvic acid (5.48). The highest mean value of carbon sequestration was observed in natural forest (4140.23 t ha-1), followed by sacred groves (3995.12 t ha-1) and lowest mean value of carbon sequestration was observed in paddy land use system (2171.45 t ha-1).

August, 2019

(Ravikumar, D.)

Major Advisor

6. Characterisationof Soils and Leaf Composition of Healthy and Crown Choking (Hidimundige) Affected Arecanut Gardens in Chitradurga district, Karnataka

(SUJAINA, M.)

ABSTRACT

An investigation on "Characterisation of soils and leaf composition of healthy and crown choking (Hidimundige) affected arecanut gardens in Chitradurga district, Karnataka" was under taken at College of Agriculture, Shivamogga during 2018-2019 to delineate the causes for hidimundige syndrome in arecanut.Soil samples from two depths 0 to 30 cm and 30 to 60 cm were collected at 60 cm away from the trunk of arecanut from both healthy and affected gardens of Holalkere, Hiriyur, Chitradurga and Hosadurga taluks. The collected soil samples were analysed for various physical and chemical properties and also for macro and micro nutrients. Similarly, leaf tissues from corresponding healthy and affected garden were also collected from 4th and 6th leaf of the arecanut trees and subjected to analysis for macro and micro nutrients. The results of the investigation indicated that soils coming underaffected gardens showed the high mean clay content than healthy gardens.There was a significant increase in bulk density of affected gardens compared to healthy gardens in Holalkere (from 1.63-1.84 Mg m-3) and Hosadurga (from 1.84-1.96 Mg m-3) taluk at lower depth.The drainable porosity decreased significantly in affected gardens compared to healthy gardens of Holalkere (from 33.54-25.69 %) and Hosadurga (from 25.79-21.23 %) taluk at lower depth.In all taluks, majority of the soils from both healthy and affected arecanut gardens were neutral to alkaline in reaction. There was no significant difference between the electrical conductivity and organic carbon content of healthy and affected gardens of Chitradurga district. The study showed that availability of N, P, K, S, Fe, Mn, Cu and B and also the content of exchangeable Ca and Mg was quite heterogeneous in both healthy and affected gardens. Whereas, available zinc status in the soil showed significant decrease in affected gardens compared to healthy gardens of Hiriyur, Chitradurga and Holalkere taluks.Among the leaf tissue nutrients, concentration of zinc decreased significantly in affected gardens compared to healthy gardens which were less than the normal level.

August, 2019 (Sarvajna B. Salimath)

Major Advisor

7. Effect of Hydrogel on Soil Properties in Groundnut (*Arachis hypogaea* L.) under Central Dry Zone of Karnataka

(VIVEK, M. S.)

ABSTRACT

A field experiment entitled 'Effect of hydrogel on soil properties in groundnut (Arachis hypogaea L.) under central dry zone of Karnataka'was conducted during *Kharif* 2018 under rainfed condition at Zonal Agricultural and Horticultural Research Station, Babbur farm, Hiriyur. The experiment was laid out in a Randomized Complete Block Design with ten treatments replicated thrice, the treatments comprised of various levels of hydrogel applied at 1.0, 2.0, 3.0 and 4.0 kg ha^{-1}along with recommended dose of fertilizers and FYM at 10 t ha^{-1}. Among the different levels of hydrogel application, treatment that received hydrogel at 4 kg ha-1 along with RDF and FYM at 10 t $ha^{-1}$was recorded significantly higher growth, biochemical and yield parameters such as plant height (38.74 cm), total chlorophyll content (1.345 mg g^{-1} fresh weight), chlorophyll stability index (81.37 %), number of pods (25 $plant^{-1}$), pod yield (1470 kg ha^{-1}) and haulm yield (3114 kg ha^{-1}).

Soil physical, chemical and biological properties such as MWHC (25.12 %), FC (15.46 %), AWC (13.32 %), moisture content (9.92 %), OC content (4.91 g kg^{-1}), available nutrients such as N, P2O5, K2O and S(283.05, 46.97, 367 kg ha^{-1} and 11.84 mg kg^{-1}, respectively), exchangeable Ca and Mg (5.97 and 2.86 kg ha^{-1}), microbial population viz., bacteria, fungi and actinomycetes and soil enzymatic activity viz., dehydrogenase, urease and alkaline phosphatase were recorded significantly higher in treatment with application of hydrogel at 4 kg ha^{-1} along with RDF and FYM at 10 t $ha^{-1}$when compared to control.

August, 2019

(Parashuram Chandravamshi)

Major Advisor

Horticulture

Crop Improvement and Biotechnology

University of Agricultural and Horticultural Sciences, Shivamogga

M. Sc. (Hort.) theses abstracts produced in the

Department of Crop Improvement and Biotechnology

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1. Genetic Diversity Studies in Vegetable Amaranthus (*Amaranthus Tricolor* L.) Genotypes for Yield and its Component Traits

(ANNAPOORNA H. AGADI)

ABSTRACT

Anexperiment was conducted to study genetic diversity in vegetable amaranthus (Amaranthus tricolor l.) genotypes for yield and its component traits at the Department of Crop Improvement and Biotechnology, College of Horticulture, Mudigere, during 2018-19. The experiment was laid out in Randomized Block Design withtwo replications including twenty amaranthus genotypes.Analysis of variance revealed that highly significant difference was observed among the genotypes for yield and its component traits indicating existence of genetic variability among the genotypes. The estimates of phenotypic coefficient of variation were higher than the genotypic coefficient of variation with narrow differences.The high estimates of heritability coupled with higher values of genetic advance as per cent mean were observed for all the parameters indicating predominance of additive gene action and amenability for phenotypic selection in early generations. Total yield per plot was significantly correlated with number of branches per plot, stem weight of plant per plot and foliage yield per plant. High positive direct effect was observed between foliage yield per plot with stem girth, number of branches per plant, leaf length, stem weight of plant per plot,which are important characters to be accounted for gaining improvement in yield. Twenty genotypes were grouped into six distinct clusters based on Mahanolobis'sD2 statistic.Twenty amaranthus genotypes were grouped into six distinct clusters. Cluster V was the largest cluster having five genotypes followed by cluster-III with four genotypes, cluster II, cluster I and cluster IV included three genotypes each and cluster VIincluded two genotypes.Number of nodes per plant (78.42 %) contributed maximum to the total genetic diversity.ArkaArunima, Chikmagalur local, IC-551486, IC-551494 and IC-551466 recorded high foliage yield per plot and these can be utilized in further breeding programme.

August, 2019

(Shashikala S. Kolakar)
Major Advisor

2. Morphological and Molecular Characterization of Arecanut (*Areca catechu* L.) Germplasm

(KIRAN KUMAR, D.G.)

ABSTRACT

The present investigation was carried out in a randomized block design and replicated twice. Significant differences among 25 arecanut accessions were observed for most of the characters under study. High heritability coupled with high genetic advance as per cent mean, high GCV and PCV were observed for number of female flowers per inflorescence per palm per year, number of nuts per inflorescence, fresh fruit weight, dry weight of nuts, dry weight of kernel, dry weight of husk and fresh nut yield indicated lesser influence of environment on expression of these traits and prevalence of additive gene action in their inheritance. Hence, these traits are amenable to selection for genetic improvement. Dry kernel yield per palm was postively and significantly correlated with palm height, husk thickness, kernel breadth and dry weight of kernel at both genotypic and phenotypic level. Path analysis revealed that positive direct effects on dry kernel yield was showed by palm height, leaf length, number of nuts per palm per year, fruit set (%), husk thickness, kernel length and kernel recovery (%). Twenty-five accessions were grouped into ten clusters based on Mahalanobis D2 statistic, where Cluster I was the largest containing 9 accessions followed by Cluster III (5 accessions). The maximum inter cluster distance was observed between cluster IV and cluster IX followed by cluster III and cluster IV. Highest intra cluster distance was observed in cluster III. Dry weight of husk contributed maximum to the total genetic diversity followed by Kernel recovery (%). Molecular diversity using SSR markers revealed high genetic diversity among accessions and the dice similarity index based on SSR data ranged from 0.458 to 1.00. UPGMA dendrogram revealed 3 major clusters divergent at 72 per cent similarity level. Considering the magnitude of cluster mean and agronomic performance Boko, Amchup, Ketakibari and Kumargaon considered as promising and can be utilized for future crop improvement programmes.

August, 2019

(Lakshmana, D.)
Major Advisor

3. Heterosis and Combining Ability Studies for Yield and Yield Attributes in Bitter Gourd (*Momordica charantia* L.) under Hill Zone of Karnataka

(SUSHMITHA J. SHETTY)

ABSTRACT

The study on heterosis and combining ability studies for yield and yield attributes in bitter gourd was undertaken during 2018-2019 at the Department of Genetics and Plant Breeding, College of Horticulture Mudigere. Twenty eight hybrids derived by crossing eight parents in half diallel mating system were evaluated along with parents and standard checks in a randomized complete block design. The variances due to genotypes varied significantly for all the characters studied. The mean performance of majority of the hybrids was better than parents for almost all qualitative and quantitative parameters. The magnitude of heterosis over mid parent, better parent and standard checksArkaHarit and Pusa Do Mousami were in desirable direction for characters studied. The crossHiriyur local × Hubli local exhibited significant positive heterosis over check ArkaHarit (138.71 %) and over Pusa Do Mousami (106.95 %) for fruit yield (t/ha).The studies on combining ability revealed that, additive variance was higher than dominance variance for majority of characters indicating preponderance of additive gene action. The parentsHiriyur local and Hubli local were identified as good general combiners for overall characters studied. Similarly, crosses Chamrajpet local × Villupuram green long and Dharwad local × Chitradurga local were identified as good specific combiners. HybridsHiriyur local × Hubli local(18.46 t/ha) and Chamrajpet local × Villupuram green long(15.70 t/ha) were considered as most productive hybrids and Chamrajpet local × Villupuram green long (67.20 %) andVillupuram white long × Chamrajpet local (47.77 %) were considered as most heterotic hybrids.

August, 2019

(Shashikala S. Kolakar)
Major Advisor

4. Survey and Assessment of Genetic Variability for Yield and Yellow Leaf Disease in Arecanut (*Areca catechu* L.)

(VIRUPAKSHI HIREMATA)

ABSTRACT

The present investigation was carried out to assess the genetic variability for yield and yellow leaf disease in eight years old arecanut plantation at AHRS, Sringeri which is located in the Western Ghats of Karnataka during Kharif and Rabi seasons of 2018-19. Ten arecanut cultivars viz., Sumangala, Sringeri Local, Mohithnagar, SAS-1, Hirehalli Dwarf, Keladi Local, Sagar Local, Thirthahalli Local, Sreemangala and Mangala were laid out in Randomized Block Design with three replications. Survey for incidence of Yellow Leaf disease on arecanut was carried out in major arecanut growing Malnad areas of Karnataka namely Sringeri and Koppa during Kharif 2018 and observed high incidence of YLD as it ranged from 86.59 to 96.20 per cent. Highest disease incidence and disease index was recorded in Muruvinakombe village followed by Talamakki and it was also recorded natural escapes for the YLD were it ranged from 2 to 5 in number and the maximum numbers were observed in the Honnavalli, Bandlapur, Kachkal, Hoskoppa. Higher PCV and GCV were observed for most of the traits and highest heritability was observed for recovery percentage. The association of fruit yield per palm was positively significant with fifteen fruit and quality characters. Path analysis revealed that nineteen of thirty eight characters showed positive direct effect on fruit yield per palm. Genetic diversity for YLD resistant and susceptible genotypes revealed that RAPD marker produced the 4 clusters, ISSR marker produced the 6 clusters and RGP marker produced the 5 clusters which indicates variability exist in studied genotypes of arecanut. These resistance plants can use in the further crop improvement and resistance breeding for YLD disease of arecanut.

August, 2019

(Narayana swamy M.)
Major Advisor

Entomology

University of Agricultural and Horticultural Sciences, Shivamogga

M. Sc. (Hort.) theses abstracts produced in the

Department of Entomology

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1. Diversity of Carabids Collected by Light and Pitfall Traps under Different Ecosystems of Mudigere

(SHILPA, S.)

ABSTRACT

A study on diversity of carabids collected by light and pitfall traps was conducted during 2018 and 2019 in three agro-ecosystems viz., coffee, cardamom, and mixed cropping at Mudigere. One UV light trap and six pitfall traps were set up at weekly intervals in all the three ecosystems. The collected carabids were processed and identified possibly up to species level. A total of 1,782 individuals and 45 species were collected comprising 14 subfamilies, 37 genera and 20 tribes from all the three ecosystems, representing 677, 527 and 578 individuals and 45, 42 and 43 species in coffee, cardamom and mixed cropping ecosystem, respectively. The diversity values of Shannon-Weiner and Simpson's reciprocal index showed that cardamom ecosystem as diverse (1.47 and 4.53, respectively) than other two ecosystems with respect to light trap collection while pit fall traps in coffee trapped diverse (1.309 and 3.823, respectively) carabids than other two ecosystems. The diversity values for Shannon-Weiner and Simpson's reciprocal index for the pooled data of both traps was 2.23 and 5.30, respectively in cardamom which was higher than the other two ecosystems. Similarly, when the traps used were compared higher diversity of carabid beetles was found with light traps in all three ecosystems i.e., 1.44, 1.47, and 1.40 in coffee, cardamom and mixed cropping ecosystem, respectively than the pitfall traps with diversity values of 1.30, 1.19 and 1.11. Both parametric and non-parametric species estimates anticipated nearly eight to 20 species more in each ecosystem at Mudigere through extended and more acute sampling. According to Wolda's classification of seasonality, the carabids could be grouped into eight classes out of nine classes. The activity of the carabids was significantly correlated with one or the other weather parameters considered in the study except for rainfall which did not have significant effect on species richness.

July, 2019

(Suchithra Kumari, M. H.)
Major Advisor

2. Studies on Sweet Potato Weevil, *Cylas formicarius* (Fab.) (Brentidae: Coleoptera) under Hill Zone of Karnataka

(MANASA, B.)

ABSTRACT

Studies on bioecology, screening of sweet potato genotypes and management of sweet potato weevil, Cylas formicarius (Fab.) (Brentidae:Coleoptera) was carried out at College of Horticulture, Mudigere, Karnataka during 2018-2019. The results from the bioecological study revealed that the average egg period, larval period, pupal period and adult longevity of both male and female lasted for 7.53, 31.40, 5.47, 93.6 and 89.7 days, respectively with an average fecundity of 124.70 eggs per female. The duration taken for completion of total life cycle from egg to adult was 38 to 49 days at temperature and relative humidity that ranged from 21.8 to 26.6°C and 80 to 85 %, respectively. The varietal preference studies of eighteen sweet potato genotypes evaluated against sweet potato weevil indicated that, the genotypes, BSP-23, BSP-18, BSP-35 and BSP-39 were found to be resistant and recorded significantly lower per cent damaged tubers and higher marketable tuber yield. Whereas, BSP-17, BSP-19, BSP-21, BSP-25, BSP-26, BSP-28, BSP-29, BSP-32, BSP-34 and BSP-38 genotypes were recorded as moderately resistant. Further, the genotypes, BSP-30, BSP-33 and BSP-40 were found to be moderately susceptible. However, BSP-37 was recorded as susceptible to sweet potato weevil. Among the insecticidal treatments applied for the management of sweet potato weevil in the local sweet potato variety, Sree Bhadra, foliar sprays of chlorpyriphos 20 % EC @ 2ml/l, vine treatment with chlorpyriphos 20 % EC @ 5ml/l and vine treatment with imidacloprid 17.8 % SL @ 1ml/l were found effective in reducing sweet potato weevil population and recorded significantly lower per cent damaged tubers, higher marketable tuber yield, higher gross return, net return and B:C ratio than recommended in package of prectice. Whereas, vine treatment with azadirachtin 10,000 ppm @ 3ml/l and foliar sprays of malathion 50 % EC @ 2 ml/l were recorded as less effective in managing sweet potato weevil.

August, 2019

(L. Hanumantharaya)
Major Advisor

3. Studies on Tomato Varieties and Traps against Tomato Pin Worm, *Tuta absoluta* (Meyrick) (Lepidoptera : Gelechiidae)

(MOHAN RAJ K. N.)

ABSTRACT

Studies on tomato varieties and traps against tomato pin worm wasconducted in field conditions at Devagondanahalli village of Chikkamagaluru taluk and district of karnataka. Screening of ten tomato varieties against tomato pin worm during 2018-19 showed that, all of the varietieswere susceptible to the pest attack exceptArkaRakshak which recorded lowest number of leaf mines, larvae and fruit infestation per plant (0.37, 0.03 and 16.67 %, respectively) with higher trichome density (36.90 / cm2).The correlation studies carried out between biochemical constituents and average number of larval mines per plant showed a positive correlation with chlorophyll content (0.79) and total sugars (0.83). Whereas, it was negatively correlated with total phenols (-0.87). The field observations on seasonal incidence duringMay, 2018 to April, 2019indicated that, infestation was noticed in all three stagesviz., seedling, vegetative and fruiting stages,however maximum number of leaf mines (2.67), number of larvae (1.90) per plant and fruit infestation (55.50%)were recorded during February 2019, which also recorded positive correlation with maximum temperature and negative correlation with rainfall. While, least infestation was found during June, 2018 with nil larval mines, number of larvae (0.10) per plantand fruit infestation of 5.15 per cent. Studies on three different pheromone traps along with tomato leaf miner lure (TLM) showed significantly maximum number of moth catches per trap with an average of 120.28 in delta trap, followed by yellow sticky trap (40.05) andminimumnumber of moth catches in wota trap (6.92). Delta trap with TLM lure proved superior over other traps with maximum number of moth catches throughout the cropping season. Maximum number of moth catches during crop growth was found at second fortnight and continued up to fourth fortnight.

August, 2019

(Girish R.)
Major Advisor

4. Studies on Major Insect Pests of Chrysanthemum and Management under Naturally Ventilated Polyhouse Condition

(RAJESHWARI, A. N.)

ABSTRACT

An investigation was carried out on screening of chrysanthemum genotypes and management of whitefly, (Trialeurodes vaporariorum Westwood), serpentine leaf miner (Liriomyza trifolii Burgess) and aphid (Macrosiphoniella sanborni Gillette) by using newer insecticides and botanicals. The experiment was carried out in a naturally ventilated polyhouse condition during 2018-19 at College of Horticulture, Mudigere. Fourteen genotypes of chrysanthemum were evaluated among them, Kolkata Orange (0.61 nymphs/2 cm2 and 2.46 adults/leaf, respectively) was resistant to whitefly. Whereas, genotypes, Poornima White, Paper White, Rose and Poornima Yellow (2.60, 3.17, 3.27 and 3.85 mines/leaf, respectively with 20.14, 24.54, 24.59 and 25.71 % leaf miner infestation/plant, respectively) were categorized as resistant to leaf miner. Further, genotypes viz., Kavery, Rose, Poornima White, Violet, Chandini, Poornima Yellow and Red Ruby (6.76, 6.77, 7.90, 8.47, 11.73, 13.21 and 15.31 aphids/2 cm apical shoot, respectively) were categorised as moderately resistant to aphids. Among the insecticides tested, diafenthiuron 50 WP, dinotefuron 20 SC and flonicamid 50 WG was found to be superior in reducing the whitefly population whereas, dinotefuron 20 SC, flonicamid 50 WG, thiamethoxam 25 WG, fipronil 5 SC and triazophos 40 EC were proved to be effective in reducing leaf miner infestation. Whereas, dinotefuron 20 SC, flonicamid 50 WG and fipronil 5 SC were proved to effective in reducing aphid population. Among scheduling, T7 (fipronil 5 SC + flonicamid 50 WG + diafenthiuron 50 WP + thiamethoxam 25 WG) schedule was proved to be better in reducing whitefly, leaf miner and aphid population of chrysanthemum under naturally ventilated polyhouse condition.

August, 2019

(L. Hanumantharaya)
Major Advisor

5. Novel Approaches for Management of Coffee Stem Borer, *Xylotrechus quadripes* Chevrolat (Coleoptera: Cerambycidae)

(BASAVARAJ, K.M.)

ABSTRACT

Novel approaches for management of coffee stem borer, Xylotrechusquadripeswas studied during 2018-19 in Department of Entomology, College of Horticulture, Mudigereand coffee plantations of Coffee Day Global Pvt. Ltd. in Chandrapore village, Kollibylu coffee estate and Chenniga village of Mudigere taluk.Male X. quadripesbeetles emerged one week before emergence of female X. quadripesbeetles.The peak beetle emergence was noticed during the third week of November across four coffee typesviz., Selection-9, Selection-795, Catimor and Hemavathy.The earliest emergence of male and female X. quadripes was noticed in Catimor during the third week of October 2018 and second week of November 2018 respectively.The lowest number of infested plants (23 out of 30plants) and 2.55 rings per plant were noticed in helical gum-line treated plot. The highest per cent decrease in infestation and rings over control was recorded in gum-line treatment with 81.82 and 71.23 per cent, respectively.The number of male and female beetles trapped was 10.25 and 7.5 in Gum-line and Gummy plastic twine treatments, respectively. The number of beetles trapped in cross-vane trap with pheromone lure (2.5 beetles) andcross-vane trap without pheromone lure (2.25 beetles) treatments did not differ significantly. Among uprooted coffee stumps disposal methods, uproot and store in mesh house method was superior with respect to trapping beetles and net returns.

September, 2019

(Revanna Revannavar)
Major Advisor

Floriculture and Landscape Architecture

University of Agricultural and Horticultural Sciences, Shivamogga

M. Sc. (Hort.) theses abstracts produced in the

Department of Floriculture and Landscape Architecture

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1. Studies on Diversity and Characterization of Wild Orchids in Western Ghats of Chikkamagaluru

(CHAITRA, H. P)

ABSTRACT

The investigation on "Studies on diversity and characterization of wild orchids in Western Ghats of Chikkamagaluru" carried outat Orchidarium, Department of Floriculture and Landscape Architecture, College of Horticulture, Mudigere, during 2018-19. Survey of wild orchids of Sringeri was under taken to assess the diversity of orchids. Twenty nine species belonging to 22 genera of wild orchids were recorded of which 27 species were epiphytic and two were terrestrial.Hopeaponga (Dennst.) Mabb.was observed as the best host among all host trees hosting about 176 wild orchids belong to different genera.Cleisostomatenufolium (L.) Garaywas densely populated in the study area (41.33).The highest Shannon's diversity index was observed for Koradakallu (2.34) and the highest Simpson's diversity index was recorded forKunchebailu and Koradakallu (0.87each, respectively). Morphological characterization of39 species of wild orchids weretaken up in the present study using Completely Randomized Block Design (CRD) with three replications under shade house. The maximum plant height was recorded in Aeridesmaculosum Lindl.(49.60 cm) among monopodials and in Dendrobium herbaceumLindl.(98.07 cm) among sympodials.The maximum number of leaves per plant was observed in Dendrobium herbaceumLindl. (58.67). The highest number of inflorescence were found in Liparis viridifolia (Blume) Lindl. (17.67) and maximum number flowers was observed in Schoenorchissmeeana(Rchb.f.) Jalal, Jayanthi and Schuit(256).Molecular characterization of 22 wild orchids was performed using 17 SSR markers and the cluster analysis grouped them into 8 different genetic clusters. The highest PIC value 0.37 was observed for OA 18, DNESSR 24 and DNESSR 85. The highest genetic similarity of 89 per cent was observed between CoelogynebreviscapaLindl. And Coelogyne nervosa A. Rich. and the least genetic similarity of 10 per cent was observed between Aeridesringens(Lindl.) C.EC.Fish. and Dendrobium aqueumLindl.

August, 2019

(Nataraj, S. K)
Major Advisor

2. Effect of Foliar Application of Bio-Stimulants on Growth, Flowering and Quality of Gladiolus Cv. Summer Sunshine

(HARISH, K.)

ABSTRACT

An experiment was conducted to know the influence ofbio-stimulants on growth, flowering and quality of gladiolus Cv. Summer Sunshine in Department of Floriculture and Landscape Architecture, College of Horticulture, Mudigere, during 2018-19.The experiment was consisted with 11bio-stimulantsviz.,T1-Humic acid (0.4%), T2-Humic acid (0.6%), T3-Biovita-(0.4%), T4-Biovita (0.6%), T5-Biozyme (0.4%), T6- Biozyme(0.6%), T7- Spic cytozyme(0.4%), T8-Spic cytozyme(0.6%), T9-Recharge (0.4%), T10- Recharge (0.6%), and T11-Controland replicated thrice in Randomized Complete Block Design (RCBD). The results revealed that application of Biozyme @ 0.4 per cent recorded maximum plant height (76.07 cm), number of leaves (11.33), leaf area (1251.96 cm2), leaf area index (2.09), leaf dry weight (8.90g/plant), flower dry weight (9.10g/spike), total dry matter accumulation (27.27g/plant), crop growth rate (0.22g/m2/day), relative growth rate (0.0094g/g/day) and net assimilation rate (0.041g/dm2/day). With respect to flowering and quality parameters, Biozyme at 0.4 per cent recorded minimum daystaken for initiation of inflorescence (75.00),first floret opening (80.67days),50% flowering (84.67days), duration of flowering (22.00 days), spike length (87.87 cm), rachislength(43.47 cm), number of florets per spike (16.07), floret diameter (12.48 cm), floret length(12.95 cm), spike girth(10.49 mm),spikeweight (74.92 g) and vase life (12.59 days).The yield parameters likenumber of spikes per plant (1.51), spike yield per plot (45.30) andspike yield per hectare (2,26,500.00) recorded in Biozyme at 0.4 per cent. The maximum corm parameters were recorded in Spic cytozyme at 0.4 per cent,corm weight per plant(102.53g), corm weight per plot (2.54kg), diameter of the corm(5.14cm), corm yield per plant(2.53), corm yield per hectare (12683.33kg). Biozyme @ 0.4 per cent recorded maximum cost benefit ratio (1:2.40).

August, 2019

(S. Y. Chandrashekar)
Major Advisor

3. Standardization of Potting Media for *Nephrolepis undulate* J. Sm under Protected Condition

(KAVANA, G. B)

ABSTRACT

An investigation on "Standardization of potting media for Nephrolepis undulate J. Sm under protected condition" was carried out in experimental block of Department of Floriculture and Landscape Architecture. College of Horticulture Mudigere during 2018 – 2019.The experiment consists often treatments viz., T1 - Soil + Sand + FYM (2:1:1), T2 - Soil + Cocopeat + Vermicompost (2:1:1), T3 - Soil + Coir pith + Vermicompost (2:1:1), T4 - Soil + Cocopeat + FYM + Vermicompost (2:1:1:1), T5 - Soil + Perlite + Coir pith + Vermicompost (2:1:1:1), T6 - Cocopeat + Sand + FYM (2:1:1),T7 - Cocopeat + Vermicompost + Coir pith (2:1:1), T8 - Cocopeat + Vermicompost + FYM (2:1:1),T9 - Cocopeat + Perlite + Sand + Vermicompost (2:1:1:1) and T10 - Cocopeat + Perlite + Coir pith + Vermicompost (2:1:1:1)with three replications with Completely Randomized Design (CRD).The suckers were planted in the 12" pots during October 2018.The significant differences were observedin the treatments.Among them the plants which are grown in the media soil + cocopeat + FYM + vermicompostrecorded the maximum plant height (95.30 cm), plant spread in EW and NS (72.00 and 73.67 cm, respectively),number of shoots (6.17), number of croziers (3.10), number of fronds (12.00), frond length and width (87.00 and 15.67 cm, respectively), number of leaflets per frond, sori per leaflet (135.00 and 63.00), total chlorophyll and visual plant grade (2.96 mg/g of fresh weight and 4.85, respectively), shelf and vase life (8.00 and 20.33 days, respectively), N, P and K (5.10, 0.59 and 2.65 %, respectively)with maximum net returns and benefit cost (2.15) ratio.From the investigation, it is concluded that, media containing soil + cocopeat + FYM + vermicomposthas significantly enhanced the vegetative, reproductive and quality parameters of Nephrolepis fern.

August, 2019

(S. Y. Chandrashekar)
Major Advisor

4. Effect of Bioagents on Growth, Yield and Management of Fusarium oxysporum f. sp. Callistephi in China Aster [*Callistephus chinensis* (L.) Nees.] cv. Kamini

KRISHNA, G.

ABSTRACT

The present study consisting of two experiments, one on effect of bioagents on growth and yield of China aster cv. Arka Kamini with seven treatments were replicated thrice using Randomized Complete Block Design in field condition, while another experiment on effect of bioagents and Fusarium oxysporum f. sp. callistephi challenge inoculation on growth, yield and management of Fusarium wilt of China aster with fourteen treatments were replicated thrice using Completely Randomized Design under pot condition at the Department of Floriculture and Landscape Architecture, College of Horticulture, Mudigere, during 2018-19. The maximum plant height (60.38 cm), number of branches (12.67), stem girth (1.30 cm), plant spread (568.82 cm2), days to flower bud initiation (58.00), first flowering (65.33 days), fifty per cent flowering (69.87 days), duration of flowering (40.07 days), flower head diameter (5.75 cm), flower stalk length (18.22 cm), vase life (8.60 days), shelf life (39.00 hrs), number of flowers per plant (48.60), individual flower weight (2.46 g), flower yield per plant (119.56 g), flower yield per hectare (13.28 tons), root length (12.78 cm), root weight (15.59 g) and minimum disease incidence (13.44 %) were observed with Trichoderma harzianum, while colony forming units found maximum at 90 days of application in Arka Microbial Consortium (92.50 cfu and 75.00 cfu at 10-1 and 10-2 dilution respectively). Similarly, among bioagents and challenge inoculation with Fusarium oxysporum f. sp. callistephi, vegetative growth, flowering, flower quality and flower yield were found maximum with Trichoderma harzianum and no disease incidence was observed. While, colony forming units were found maximum at 90 days application in Arka Microbial Consortium (92.50 cfu and 66.50 cfu at 10-1 and 10-2 dilution respectively). The antagonistic activity of different bioagents against F. oxysporum f. sp. callistephi was evaluated under in vitro and highest inhibition of 90.06 per cent noticed with Trichoderma harzianum.

August, 2019

(Nataraj, S.K.)
Major Advisor

5. Effect of Bio-Regulators on Growth and Development of Asiatic Lily under Protected Condition

(RAGINI, B. K.)

ABSTRATCT

An experiment on “Effect of bio-regulators on growth and development on Asiatic lily under protected condition” was carried out at Department of Floriculture and Landscape Architecture, College of Horticulture, Mudigere, during 2018-19. The experiment was laid out in a Randomized Completely Block Design (RCBD)andreplicatedthricewith 13 treatments viz., Gibberellic acid(GA3) (100, 150 and 200 ppm), Benzyl adenine (BA) (150, 300 and 450 ppm), Naphthalene acetic acid (NAA) (100, 150 and 200 ppm) and Chlormequat chloride (CCC) (1000, 1500 and 2000 ppm) along with control. The bulbs were dipped in different bio-regulators for 12 hours. The results revealed that GA3 @ 200 ppm recorded minimum days for sprouting (3.33), maximum plant height (98.44 cm), number of leaves per plant (80.93), leaf length (12.53 cm), leaf breadth (2.77 cm), leaf area (1704.60 cm2), leaf area index (5.68), early bud initiation (37.67 days),flowering (67.47 days),50 per cent flowering (73.20 days), bud length (5.83 cm), bud diameter (15.96 mm), length of petiole (7.23 cm), diameter of the flower (20.84 cm), petal length (11.54 cm), petal breadth (5.01 cm), number of spikes per m2 (28.97), length of the stalk (80.40 cm), stalk weight (99.33 g), diameter of the bulbs (11.00 cm), weight of bulbs (109.67 g), yield of bulbs per plot (2.27 kg), number of scales (24.27), length of scales (2.75 cm) and breadth of scales (2.40 cm).CCC @ 2000 ppm recorded the maximum diameter of petiole (6.42 mm), days taken for flower senescence on the plant (20.67), vase life of flowers with anthers (14.17 days) and vase life without anthers (16.63 days). The treatment BA @ 150 ppm recorded a maximum number of buds per plant (9.17), maximum number of bulbs per plant (3.00), number of bulblets per plant (6.07) and also recorded highest benefit-cost ratio (1:2.26).

August, 2019

(Chandrashekar S. Y.)
Major Advisor

6. Performance of Liliums under Protected Cultivation in Transitional Zone of Karnataka

(SANDESH, P)

ABSTRACT

The present investigation entitled "Performance of Liliums under protected cultivation in transitional zone of Karnataka" was carried out under the polyhouse structure Department of Horticulture, College of Agriculture, University of Agricultural and Horticultural Sciences, Shivamogga during the 2018-19. Among the seven lilium cultivars studied the Cv. Yelloween was found to be superior with respect to plant height (56.93 cm) and number of leaves per plant (69.24), leaf area and leaf area index at peak growth stage and the cv. Justina Zantrijus recorded maximum leaf length. While, leaf breadth was higher in Meriva Zanlorva. The Cv. Indian Summerset recorded maximum chlorophyll 'a', 'b' and total chlorophyll content and the Cv. Indian Summerset took minimum number of days for the flower bud emergence (28.56) and days taken to 50 per cent flowering, days to flower harvest and flower senescence in plant. The maximum length of flower stalk, weight of flower stalk and stalk girth, was noticed in Cv. Yelloween. The highest number of florets per spike was produced by the Cv. Yelloween. The maximum bud length and bud diameter was recorded in the Cv. Meriva Zanlorva, while, Cv. Yelloween recorded maximum vase life both in with anthers and without anthers. Significant differences were observed among cultivars with respect to number of spikes per square meter. The Cv. Yelloween (23) recorded the maximum number of spikes per square meter followed by Pavia (22), while it was recorded minimum in the Justina Zantrijus (16). With respect to bulb parameters Yelloween produced maximum bulb weight, number of bulblets per bulb, weight of bulblet, bulb diameter, number of scales per bulb, length and breadth of scale, followed by Justina Zantrijus. While it was recorded minimum in the Cv. Indian Summerset. The Cv. Yelloween (2.22) realized maximum net returns and benefit to cost (B: C) ratio followed by Cv. Pavia (2.13) compared to all other cultivars.

August, 2019

(B. HemlaNaik)
Major Advisor

7. Standardization of Vase Chemicals for Longevity and Quality of Multiple Cut Flowers

(SATISH GOPALASETTI)

ABSTRACT

The present investigation was carried out on Standardization of vase chemicals for longevity and quality of multiple cut flowers, at the Department of Postharvest Technology, College of Horticulture, Mudigere, during 2018-2019.Total four experiments were conducted.In 1 to 3rd experiment standardization of sucrose, germicide/ mineral salts and bio-regulator concentration were studied and that of experiment-4 combined effect of all these chemicals were studied. The experiments were laid out in Completely Randomized Design with three replications and each conical flask was containing 500 ml of vase solution with eight flowers (rose, carnation, gerbera and anthurium two flowers each). In experiment-ISucrose @ 4.0 per cent (13.75 days) and 6.0 percent (12.27 days), experiment-II Aluminium sulphate @ 75 ppm (10.21 days) and 50 ppm (9.86 days) and experiment-III Benzyladenine@ 75 ppm (13.41 days) and 100 ppm (12.29 days) recordedthe significantly maximum vase life. Further, the best two concentrations from earlier experiments were selected and their effect were studied in experiment-IV.

Among seventeen treatments combinations, it was found that multiple cut flowers wereplaced in sucrose (6.0 %) + Aluminium sulphate(75 ppm) exhibited the maximum cumulative water uptake (301.14g), cumulative transpiration loss of water (323.22 g), cumulative water balance(-22.08 g), relative fresh weight (66.96 %), final fresh weight (88.29g), vase life (15.25 day)andaverage sensoryscore (4.92) with the lowest bacterial count (7.08 CFU x 104ml-1), final pH (3.24) and vase chemical cost (₹6.08/day/ flowers). Hence, above treatment combination maintaining the longevity and quality of multiple cut flowers.

August, 2019

(Kantharaj. Y)
Major Advisor

8. Response of Microbial Consortia at Graded Levels of N P K on Growth, Flowering, Quality and Yield of Asiatic Lily under Protected Cultivation

(SHILNA MUKUNDAN, P.V.)

ABSTRACT

The study was conducted to find out the suitable combination of graded levels of N P K and biofertilizers on growth, flowering, quality and yield of Asiatic lily Cv. Indian Summerset under protected cultivation during 2018-19 in the Department of Horticulture, College of Agriculture, Shivamogga. The experiment consists of seventeen treatments with three replications laid at Complete Randomized Design (CRD). The significant differences were observed for growth, flowering, flower quality and yield parameters. Among the treatments studied the treatment at 75 % RDF + Azotobacter croococcum + Aspergillus awamori + Bacillus musilogenesis (T14) recorded significantly higher values with respect to plant height (55.09 cm), number of leaves (54.21), leaf area index (0.83) and the flowering parameters like least number of days to first flower bud emergence (23.08 days), minimum number of days to 50 per cent flowering (47.05days) and significantly maximum duration of flowering (14.88 days). Flower quality also influenced by T14 for length of flower stalk (35.69 cm), floret stalk diameter (5.53mm), diameter of bud (23.75 mm), flower diameter N-S (17.45 cm) and E-W (17.09 cm), number of florets per spike (5.00), number of florets per m2 (46.33), vase life with anthers (11.15 days) and vase life without anthers (12.37 days). The bulb parameters like weight of bulb (11.23 g), bulb diameter (28.33 mm), number of bulblets (3.07), similarly biochemical parameters like chlorophyll a, b, total (1.27, 0.52 and 1.77 mg/g) and nutrient status like N P K initial (116.44, 32.66, 141.49 kg/ha) and final (249.99, 45.40, 432.36 kg/ha) was also found maximum in the same treatment. On the basis of results obtained in the present investigation, it was concluded that, the treatment T14 has significantly enhanced the growth, flowering, flower quality and yield attributes of Asiatic lily Cv. Indian Summerset.

August, 2019

(B. HemlaNaik)
Major Advisor

Fruit Science

University of Agricultural and Horticultural Sciences, Shivamogga

M. Sc. (Hort.) theses abstracts produced in the

Department of Fruit Science

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1. Standardization of Pot Culture Media for Economic Cultivation of Strawberry in Vertical Farming System under Naturally Ventilated Polyhouse

LAKSHMIKANTH, K. H.

ABSTRACT

The experiment was conducted to standardize pot culture media for economic cultivation of strawberry in vertical farming system under naturally ventilated polyhouse at the Department of Fruit Science, College of Horticulture, Mudigere during 2018-19. The experiment was laid out in Completely Randomized Design with seven treatments and three replications. The significant differences were observed among the treatments for different parameters. The maximum plant height (29.13 cm), number of trifoliate leaves per plant (27.80), plant spread in North- South and East- West direction (31.27 cm and 30.21 cm, respectively), leaf area (108.26 cm2), number of crowns per plant (4.56), number of runners per plant (6.13), plant dry weight (38.50 g) at harvest, number of flowers per plant (24.61), duration of flowering (70.54 days), berry weight (19.01 g), berry length (4.54 cm), berry diameter (3.58 cm), number of berries per plant (19.68), yield per plant (391.24 g), shelf life (3.10 days), net income (1,22,183 ₹/ 1032 m2) and benefit to cost ratio (2.04) recorded in the media combination having soil + cocopeat + vermiculite + vermicompost in the ratio of 1:1:1:1. The minimum days were observed for first flower emergence (50.13) and minimum titratable acidity (0.98 %), whereas maximum values for TSS (7.73 ºBrix), chlorophyll (2.36 mg g-1), total sugar (6.45 %), ascorbic acid (54.80 mg/100 g) and sugar to acid ratio (6.58) were recorded in the media combination having soil + cocopeat + vermicompost in the ratio of 1:1:1. Based on the results obtained, the plants grown in soil + cocopeat + vermiculite + vermicompost in the ratio of 1:1:1:1 showed the best response to obtain growth, yield and also maximum returns in vertical farming system.

July, 2019

(Madaiah, D)
Major Advisor

2. Effect of Foliar Nutrients and Plant Growth Regulators on Growth, Yield and Quality of Strawberry (Fragaria × Ananassa Duch.) under Naturally Ventilated Polyhouse

(RUCHITHA, T.)

ABSTRACT

A pot experiment was conducted to study the effect of foliar nutrients and plant growth regulators on growth, yield and quality of strawberry (Fragaria × ananassaDuch.) under naturally ventilated polyhouse at the Department of Fruit Science, College of Horticulture, Mudigere, during 2018-19. The experiment was laid out in Completely Randomized Design with eleven treatment and three replications. The results revealed that, the maximum plant height (19.21 cm), plant spreadin North-South and East-West directions (28.15 cm and 24.79 cm, respectively.), number of trifoliate leaves (25.20), number of crowns(4.93), leaf area(127.78 cm2), leaf area index(3.94), total dry matter(27.31 g), minimum number of days taken for flowering(85.81), number of fruits per plant(19.08) and yield per plant(299.36 g) was recorded in the treatment GA3(150 ppm). Whereas the maximum fruit weight (17.22 g), fruit volume (21.78 cc), fruit length(4.18 cm) andfruit diameter(3.90 cm) was recorded in boron (0.6 %).Total chlorophyll content (2.35 mg/g of fresh weight), total sugars(7.27 %), sugars to acid ratio(10.53) and minimum titrable acidity(0.67 %) was noticed higher in the plants supplied with ZnSO4 (0.6 %).The maximum shelf life(2.89 days) was recorded with the application of CaNO3 (0.6 %) and highest benefit: cost ratio(2.59)was noticed in GA3(150 ppm). Among different treatments GA3 (150 ppm) proved to be best for growth and yield parameters. Whereas, the zinc sulphate (0.6 %) improved the quality parameters of strawberry.

July, 2019

(B.S. Shivakumar)
Major Advisor

3. Studies on Foliar Application of Nutrients on Yield and Quality of Sapota (*Achras zapota* L.)

(SHIFA, A.)

ABSTRACT

The field investigation was carried out during the year 2018-19 in the Zonal Agricultural and Horticultural Research Station, Mudigere, to study the foliar application of nutrients on yield and quality of sapota (Achras zapota L.). The experiment was laid out in Randomized Complete Block Design with ten treatments and replicated thrice. The study observed that among growth and yield parameters spraying of 19:19:19 (1.0 %) + zinc sulphate (0.5 %) + magnesium sulphate (0.5 %) + boron (0.5 %) recorded significantly the maximum current season shoot length (12.48 cm), number of leaves per shoot (20.09), leaf area (21.35 cm2), chlorophyll 'a' (1.89 mg/ g), chlorophyll 'b' (0.96 mg/ g), total chlorophyll (2.85 mg/ g), number of flowers per shoot (12.50), number of fruits per shoot (2.45), fruit length (5.83 cm), fruit diameter (6.17 cm), fruit volume (87.25 cc), fruit weight (90.33 g), yield per tree (46.10 kg), per cent increase in yield (34.49 %), benefit:cost ratio (2.03), and low mummified fruits per cent (35.60) and quality parameters were TSS (17.89 0B), reducing sugar (7.57 %), non- reducing sugar (8.19 %), total sugar (15.76 %), ascorbic acid (23.90 mg / 100 g) and the minimum titratable acidity (0.12 %). Among post-harvest quality the maximum fruit texture (2.85 kg/cm2), shelf life (11.91 days), physiological loss in weight (10.73 %) and days taken to ripen (9.19 days) was recorded in 19:19:19 (1.0 %) + calcium chloride (1.0 %). On the basis of present investigation foliar application of 19:19:19 (1.0 %) + zinc sulphate (0.5 %) + magnesium sulphate (0.5 %) + boron (0.5 %) at monthly interval for three times has significantly increased the yield and quality attributes and spraying of 19:19:19 (1.0 %) + calcium chloride (1.0 %) maintains the post-harvest quality attributes.

August, 2019

(Kantharaj, Y.)
Major Advisor

4. Variability Studies on Bael (*Aegle marmelos* (L) Correa) Genotypes of Sakharayapattana (Chickamagalur District)

(AMULYA, R. N.)

ABSTRACT

An experiment was conducted on variability studies on bael genotypes of Sakharayapattana during 2018-19 at Sakharayapattana, Chickamagalur district with an objective to assess morphological and qualitative characters of 356 genotypes. The analysis of different characters was carried out in University of Agricultural and Horticultural Sciences, Shivamogga. The genotypes (356) showed variation in terms of tree height, plant growth habit, bark color, bark splitting habit, leaf color, leaf shape, leaf base, leaf margin, thorn length. The analysis of variance revealed a significant difference concerning fruit and quality parameters. The maximum fruit length (13 cm), fruit volume (310 cm3), fruit weight (320 g) and pulp weight (202.40 g) was observed in SB-353 genotype. The highest number of seeds (67) and seed weight per fruit (39.57 g) was recorded in SB-209 genotype. Quality parameters like TSS (SB-297 : 9.50 ^{o}B), acidity (SB-209, SB-187 : 0.32 %), vitamin C (SB-203 : 10.26 mg/100 g fruit pulp),total sugar (SB-305, SB-73 : 9.93 %), sugar : acid (SB-73 : 83.13), TSS : acid (SB-297 : 50.11) were recorded during investigation. The RAPD marker analysis on different bael genotypes revealed that the highest number of bands were observed with primer OPX-17 (197) and lowest with OPN-03 (42). The highest (0.77) PIC value was observed in primer OPM-12 and highest similarity (0.95) was found between the genotypes SB-147 and SB-90. Investigation revealed that among 356 genotypes SB-353, SB-305, SB-73 and SB-203 genotypes were found most promising for growth, yield and quality parameters. These genotypes can be used either for further evaluation or selection as a commercial cultivar or as a gene source in bael improvement programme.

August, 2019

(NagarajappaAdivappar)
Major advisor

5. Effect of Planting Densities on Growth and Yield in Banana Cv. Nendran (AAB)

(RAVI BASAVARAJ SOMAKKANAVAR)

ABSTRACT

The field experiment was carried out at Bandigowdanahalli, Chamarajnagar during 2018-19 to know the effect of planting densities on growth and yield in banana cv. Nendran (AAB). The experiment was laid out in Randomized Complete Block Design with eleven treatments and three replications. Among the treatments the treatment T9 (Planting of two suckers per hill spaced at 3 m x 3 m) showed highest plant girth (63.67 cm), number of leaves (14.54), number of suckers (9.80), leaf length (211.67 cm), leaf breadth (86.67 cm), leaf area (21.34 m2), chlorophyll content (2.32 mg/ 100 g) and lowest days taken from planting to shooting (186.67), shooting to harvest (83.67) and planting to harvest (270.33). The treatment T9 also showed highest bunch yield (14.00 kg per plant), length of bunch (59.67 cm), internodal length (7.27 cm), number of hands per bunch (7.67), weight of hand (2.27 kg), number of fingers per bunch (63.90), finger weight (182.33 g), finger length (22.93 cm) and finger girth (13.63 cm). The treatment T2 (Planting of three suckers per hill spaced at 2 m x 2 m) showed highest yield per hectare (80.00 t). However, the quality parameters were found to be best in T9 showing highest green life (8.87 days), shelf life (9.60 days), pulp weight (139.00 g), peel weight (43.33 g), TSS (26.13 °Brix), reducing sugars (17.04 %), non-reducing sugars (6.81 %), total sugars (23.86 %) and lowest acidity (0.44 %). Hence, this study shows the positive effect of high density planting on yield parameters. Whereas, wider spacing showed the positive effect in improving growth and quality parameters of banana plants.

September, 2019

(Yallesh Kumar, H. S)
Major Advisor

6. Standardization of Organic Manures for Dragon Fruit in Central Dry Zone of Karnataka

(RASHMI, P.)

(ABSTRACT)

An experiment was conducted to know the influence of organic manures on growth, flowering, yield, quality and economics of dragon fruit cultivation in the farmers field of Bhuttanatti village, Hiriyur taluk of Chitradurga district during 2018-2019. The experiment was laid out in Factorial Randomised Complete Block Design with twenty seven treatments involving different combination of organic manures with three replications. The treatment consist of three organic manures and three levels Farm yard manure (0, 15, 30 kg/pillar), Vermicompost (0, 2, 4 kg/pillar) Poultry manure (0, 250, 500 g/pillar).Among different levels of farm yard manure (FYM), vermicompost and poultry manure, application of 30 kg farm yard manure, 4 kg of vermicompost and 500 g poultry manure per pillar had beneficial effect on growth, flowering, yield and quality parameters. Significantly maximum plant canopy spread (7.55 m2) chlorophyll a (1.78 mg/g), chlorophyll b (0.12 mg/g), total chlorophyll (1.90 mg/g), number of fruits (23.20/pillar), fruit length (12.36 cm), pulp weight (321.00 g), peel thickness (1.75 mm), fruit yield (10.04 kg/pillar), fruit yield per hectare (11.04 t/ha) and ascorbic acid content (7.70 mg/100 g). However, The highest net return of Rs. 8,88,276 per hectare and benefit cost ratio of (5.12) was obtained by the combined application of 30 kg FYM, 4 kg of vermicompostand 500 g poultry manure per pillar under situationin central dry zone of Karnataka.

October, 2019

(B. HemlaNaik)
Major Advisor

7. Effects of Different Sources and Levels of Potassium through Foliar Application on Yield and Quality of Pomegranate Cv. Bhagwa

(SHEKHAR)

ABSTRACT

The field investigations were carried out during 2018-2019 in the experimental fields at College of Horticulture, Hiriyur, Chitradurga district of Karnataka to study the "Effects of different sources and levels of potassium through foliar application on yield and quality of pomegranate (Punicagranatum L.) cv. Bhagwa". The experiment was laid out in a randomized complete block dresign (RCBD) with 20 treatments with three replications. The RDF through fertigation and soil application was applied as per the package of practices and foliar spay of K was started four and half months after flowering and was given thrice at 15days interval. The results revealed that the yield parameters like average fruit weight (443.33 g), diameter (93.74mm), volume (469.45 ml) and yield per plant (10.63 kg/plant) and different aril parameters like total aril weight (363.69 g), weight of 100 arils (37.95 g) and aril percentage (82.23) were maximum in RDF through fertigation with 2 per cent K2SO4 spray. The highest rind thickness (4.14 mm) was recorded in RDF through fertigation with 2 per cent K2SO4.MgSO4 spray.The quality parameters like TSS (16.54 ºBrix), sugar: acid ratio (38.28), reducing (14.27 %), non-reducing (1.74 %) and total sugars (16.12 %), juice (89.53 %), ascorbic acid (17.87 mg/ 100g FW) and anthocyanin content (8.55 mg/ 100g FW) were highest in RDF through fertigation with 2 per cent K2SO4 spray, besides, minimum physiological loss in weight (10.83 %), with highest shelf life (14.67 days). The highest TSS (16.64 ºBrix) and juice content (88.43 %) with minimum acidity (0.39 %) during storage and maximum leaf K (1.71 %) after spray were recorded in RDF through fertigation with 2 per cent K2SO4 spray. The present findings can be commercially used in making pomegranate production more profitable (1: 2.42) by application of RDF through fertigation with 1 per cent K2SO4 spray in Bhagwa variety of pomegranate.

October, 2019

(P. Narayanaswamy)
Major Advisor

Plantation, Spices, Medicinal and Aromatic Crops

University of Agricultural and Horticultural Sciences, Shivamogga

M. Sc. (Hort.) theses abstracts produced in the

Department of Plantation, Spices, Medicinal and Aromatic Crops

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1. Effect of Liquid Nutrition and Pinching in Black Pepper (*Piper nigrum* L.) Mother Block on Quality Planting Material Production Under Polyhouse.

(HARSHITH, S. K)

ABSTRACT

An experiment was carried out to assess the effect of liquid nutrition and pinching on quality planting material production of black peppermotherblockat ZAHRS, Mudigere, during 2018-19 in FCRD with three replications. The factor 1 consists of nutrients at 4 levels (N0 - 10:5:5 g of NPK per vine as soil application (control), N1-19:19:19 @ 0.5% + ZnSO4, MgSO4 and Borax @ 0.10% each, N2-19:19:19 @ 0.75% + ZnSO4, MgSO4 and Borax @ 0.25% each and N3-19:19:19 @ 1% + ZnSO4, MgSO4 and Borax @ 0.50% each) and factor 2 consists of pinching at 3 intervals (P0 – without pinching, P1-5 daysand P2-10 days before harvest of orthotropic shoot). The results revealed that mother vines treated with 19:19:19 @ 1% + ZnSO4, MgSO4 and Borax @ 0.5% each and without pinching (T10) recorded significantly maximum vine length (178.06 cm), number of internodes (24.67), number of leaves (90.53) and number of plantable cuttings (42.00) at 120 DAT. While, the vines applied with19:19:19 at 1 per cent + ZnSO4, MgSO4 and Borax at 0.5 per cent each and pinching at 10 days before harvest of orthotropic shoot (T12) resulted in maximum leaf area (84.13 cm2), chlorophyll content (62.26 SPAD unit), carbohydrates (7.04%) and total sugars (2.15%). The shoot parameters such as days taken for fifty per cent sprouting (21.27), sprouting percentage (80.15), length of new shoot (16.80 cm), number of leaves (5.93), leaf area (73.39 cm2), fresh (21.64 g) and dry weight (8.25 g) of shoots per cutting were recorded significantly maximum at 120 DAP in T_{12}. Similarly, T_{12} was also recorded maximum root parameters Viz.,rooting percentage (78.86), number of primary roots (7.89), length of the longest root (18.37 cm), root volume (5.30 cc), fresh (4.80 g) and dry weight (1.76 g) of roots per black pepper cutting.

November, 2019

(Ravi, C. S.)
Major Advisor

2. Effect of Foliar Application of Micronutrients on Growth and Yield of French Basil (*Ocimum basilicum* L.).

(LAKSHMI SAGAR, L.)

ABSTRACT

Field experiment was carried out to study the "Effect of foliar application of micronutrients on growth and yield of French basil (OcimumbasilicumL.)" during 2018-2019 at Agricultural and Horticultural Research Station, Thirthahalli. The experiment was laid out in randomized complete block design (RCBD) with nine treatments and three replications. Results revealed thatamong different treatments, plants treated with micronutrient mixture @ 0.5 per cent recorded higher plant height(82.07 cm),maximum number of primary branches (37.87) and secondary branches (112.20), plant spread (N-Sand E-W) 50.87 cm and71.33 cm, respectively, number of leaves (538.73), leaf area per plant (4370.39 cm2), leaf area index(3.24), Total dry matter (249.60 g),higher fresh yield per plant (476.33 g/plant), fresh yield per plot (43.87 kg/plot), fresh yield per hectare (32.49 t/ha), dry yield per plant (231.40 g/plant), dry yield per plot (22.67 kg/plot), dry yield per hectare (16.79 t/ha) and oil yield per hectare (188.10 kg/ha),absolute growth rate (1.43 g/plant/day), cropgrowth rate (9.62 g/m2/day), relativegrowth rate (0.0044 g/g/day)and net assimilation rate (0.00020 g/dm2/day),chlorophyll-a (0.087 mg/g), chlorophyll-b (0.217 mg/g) and total chlorophyll content (0.304 mg/g),nitrogen content (37.47 g/kg), phosphorus content (2.42 g/kg), potassium content (49.88 g/kg), copper content (18.60 ppm) and iron content (141.66 ppm)in leaves, where as lower residual nitrogen (195.73 kg/ha), phosphorous (14.37 kg/ha), potassium (50.27 kg/ha), copper (3.74 ppm), iron (5.16 ppm), zinc (0.48ppm) and boron (0.22 ppm) contentwas found in soil after harvest in same treatment.The economic analysis clearly indicated that foliar application of micronutrient mixture @ 0.5 per cent realized maximum net return (Rs. 1,00,740/ha) and B: C ratio (2.02).

August, 2019

(Ravikumar M)
Major Advisor

3. Effect of Foliar Application of Nutrients on Yield and Quality of Cashew (*Anacardium occidentale* L.) Genotypes under Hill Zone of Karnataka

(MAHANTESH YAMAKANAMARDI)

ABSTRACT

Field experiment was carried out to study the "Effect of foliar application of nutrients on yield and quality of cashew (Anacardium occidentale L.) genotypes under Hill zone of Karnataka" during 2018-19 at College of Horticulture, Mudigere. The experiment was laid out in split plot design with six varieties as the main plot and four different nutrients foliar spray as a subplot with three replications. Results revealed that plants treated with urea @ 2 per cent recorded maximum number of flowering panicles (22.41/m2), male flowers (233.27), perfect flowers (77.50), sex ratio (0.34), fruit set (30.71 %), cashew apple length (68.57 mm) apple width (36.30 mm), apple weight (94.13 g) and apple volume (107.10 ml), nut length (30.63 mm), nut width (18.75 mm), nut weight (8.58 g), kernel length (24.35 mm) kernel width (16.75 mm), kernel weight (3.02 g) and nut yield (3.48 kg / plant and 950 kg / ha). Maximum reducing sugar (8.16 %), non-reducing sugar (4.58 %), total sugar (12.82 %) and juice content (70.68 %) were noticed in the micronutrient mixture (2 %) treatment. Maximum number of flowering panicles (22.28 / m2), kernel length (27.50 mm), reducing sugar (8.59 %), total sugar (12.94 %) and juice content (76.47 %) was observed in Vengurala-4. Maximum number of staminate flowers per panicle (278.13) and flower duration (109.26 days) in NDR-2-1. Highest number of perfect flowers (76.01), sex ratio (0.36), fruit set (34.53 %), nut yield (4.14 kg / plant and 1000 kg / ha) was noticed in Kanaka. Maximum apple weight (106.28 g), apple volume (114.44 ml), apple length (76.18 mm), nut length (32.19 mm), nut weight (10.51 g), kernel weight (3.16 g) was recorded in Priyanka. The economic analysis clearly indicated that foliar application of urea @ 2 per cent realized maximum B: C ratio (3.14).

August, 2019

(Sadashiv Nadukeri)
Major Advisor

4. Genetic Variability and Diversity Studies in Bird's Eye Chilli (*Capsicum frutescens* L.)

(SREELAKSHMI, S)

ABSTRACT

An investigation on genetic variability and diversity inthirty-five accessionsof bird's eye chilli collected from different geographical regions of Karnataka was carried out in Randomized Complete BlockDesign with three replications at the experimental block of Plantation, Spices, Medicinal and Aromatic crops, College of Horticulture, Mudigere during 2018-19.Analysis of variance revealed the presence of significant differences amongthe accessions for the characters studied. Mean performance of each accession for different growth, yield and quality traits were assessed. Acc.15 is found to be superior in terms of growth parameters viz., plant height (79.81 cm), number of primary branches (7.17) and plant spread (46.46 cm2). The Acc.160 (12.14 kg per plot) and Acc.158 (11.39 kg per plot) were found to be higher yielders of green chilli, Acc.18 (26.67 days) was early maturing type and Acc.133 (120.17 mg per 100g) and Acc.164 (2.16%) recorded high ascorbic acid and capsaicin content respectively.Morphological characterisation of the accessions was done based on UPOV guidelines of chilli. High to moderate estimates of GCV and PCV were reported for most of the characters studiedindicating the presence of wide variability among the accessions. High heritability coupled with high genetic advance as per cent mean was noticed for most of the yield related traits indicating the predominance of additive gene action for the expression of these characters. Correlation studies indicated positive association of fruit yield per plant with weight of seeds per fruit, fresh weight of ten fruits and fruit length. Out of nineteen characters studied, sixteen characters showed direct positive effect on yield per plant.Based on Mahalanobis D2 analysis, the accessions were grouped into 6 clusters with inter cluster D2 values ranging between 172.33 to 1275.15. Fruit width contributed maximum (45.38%) to the genetic diversity.Assessment of molecular diversity using SSR markers revealed monomorphism.

August, 2019

(Bhoomika, H. R.)
Major Advisor

5. Studies on the Influence of Micronutrients on Growth, Yield and Quality of Mango Ginger (*Curcuma amada* Roxb.)

VIDYA, S. P.

ABSTRACT

Mango ginger (Curcuma amada Roxb.) is an underground rhizomatous crop belonging to family Zingiberaceae. The rhizomes find wide application in pickling industry due to typical raw mango flavour and found growing in Southern states of India like Kerala, Karnataka and Tamil Nadu. The studies on agronomical requirements of the crop are scarce. Hence the present investigation entitled"Studies on the influence of micronutrients on growth yield and quality of mango ginger (Curcuma amada Roxb.)" was carried out at College of Horticulture, Mudigere during 2018-19. The treatment consisted of two micronutrients viz, zinc and boron at 0, 5 and 10 Kg/ha each, which were applied at all possible combinations. Hence there were totally nine treatments replicated thrice. The rhizomes were planted at a spacing of 30×30 cm on raised beds. The plot size was 3m×1.2m. Different growth and yield parameters were recorded at regular intervals and significant differences were recorded for almost all the parameters under the study. Application of ZnSO410 (kg/ha) + Borax (10 kg/ha) (T9) performed better with respect to plant height (73.97 cm), number of leaves (7.00), leaf area (133.27 dm2),LAI (1.48)and chlorophyll content (63.44 SPAD units) at 150 days after planting. The same treatment recorded significantly more number of secondary fingers per clump (16.44 cm), rhizome width (16.39 cm), fresh weight (192.13 g/plant) and dry weight (58.30 g/plant), total yield (29.08 t/ha) and essential oil content (1.00%). However, the treatment T6 (ZnSO4 5 kg/ha + Borax 10 kg/ha) recorded maximum primary fingers (5.93/clump) and rhizome length (17.17 cm). Nutrient uptake analysis revealed that uptake of N, P, K, S, Zn and B by plant was maximum in T9. The same treatment recorded maximum B: C ratio of 1.91: 1 and the least B: C ratio of 1.49: 1 was recorded in control.

August, 2019

(Bhoomika, H. R.)
Major Advisor

6. Morphological Characterization, Seed Propagation and Tissue Culture Studies in *Hydnocarpus pentandra* (Buch. Ham.) Oken

(VIGHNESHA BHAT)

ABSTRACT

An investigation was taken up to study the morphological characters, seed propagation and tissue culture techniques in Hydnocarpus pentandra (Buch. Ham.) Oken at Division of Plant Genetic Resources (PGR), ICAR-Indian Institute of Horticultural Research (IIHR), Bengaluru during 2018-19. Among the five accessions of Hydnocarpus pentandra, four were male and only one was female accession. Qualitative and quantitative traits were significantly differed among the accessions. Genotypic and phenotypic coefficients of variation were high for plant height and leaf area. Moderate genotypic and phenotypic coefficients of variation were found in leaf length, leaf width, petiole length and stem girth. All the characters were exhibited high heritability. Among the different germination inducing treatments, the seeds treated with GA3 (350 ppm) showed minimum number of days taken to initiate germination (35 days), maximum rate of germination (0.91), germination percentage (63.42 %), seedling vigour (2028.63) seedling height (30.46 cm), fresh and dry weight of seedling (5.76 g and 3.12 g respectively) and shoot to root ratio (1.66) compared to control. For tissue culture, shoot tips were used as explants and cultured on MS media with different concentrations of growth regulators such as BAP, IAA, Kinetin and Thiadiazuron (TDZ) either in singly or in combination. Among the treatments shoot tips cultured on MS media with combination of BAP (1.0 mg / l) + TDZ (0.5 mg / l) gave maximum number of shoots per explant (3.86) and highest shoot length (2.06 cm). Callus production was noticed in BAP at lower concentrations (0.2-0.5 mg / l) in combination with IAA (0.05 mg / l) and kinetin (0.05 mg /l).

August, 2019

(Raviraja Shetty, G.)
Major Advisor

Vegetable Science

University of Agricultural and Horticultural Sciences, Shivamogga

M. Sc. (Hort.) theses abstracts produced in the

Department of Vegetable Science

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1. Studies on Genetic Variability and Studies on Genetic Divergence and Variability for Yield and Quality Characters in Garden Pea (*Pisum sativum* L.)

(ASHA, A. B)

ABSTRACT

An investigation on genetic variability studies in garden pea was carried out in the experimental block of Department of Vegetable Science, College of Horticulture, Mudigere during 2018-19. The experiment was laid out in Randomized Complete Block Design. Analysis of variance revealed highly significant differences among the genotypes for all the characters under the study. High heritability coupled with high genetic advance as per cent over mean was recorded for plant height, number of branches per plant, node at first flower appears, days to first flowering, days to 50 per cent flowering, days taken for first picking, length, width and thickness of pod, number of seeds per pod, weight of ten pods, weight of green seeds, shelling per cent, number of pods per plant, pod yield per plant, pod yield per ha, TSS, reducing sugars and non-reducing sugar content indicating the prevalence of additive gene action for these traits. Thus, there is ample scope for improving these traits through direct selection.

Correlation studies showed that pod yield per plant exhibited positive and significant phenotypic and genotypic association with number of pods per plant and weight of ten pods. Path analysis revealed that highest positive direct effect on pod yield per plant was shown by number of pods per plant followed by weight of ten pods and length of pod. Based on Mahalanobis D2 analysis, 30 genotypes of garden pea were grouped into ten clusters. Among the traits studied pod yield per plant (38.16 %), plant height at 60 DAS (27.59 %), days for first picking and number of pods per plant (8.05 %) contributed maximum to the total genetic diversity. In this study five promising genotypes viz., Arka Priya, IIHR-44, GS-10, Arka Pramodh and Arka Apoorva have been identified for higher yield, which can be utilized for further crop improvement programme.

August, 2019

(Devaraju)
Major Advisor

2. Effect of Plant Geometry and Nutrition on Growth, Yield and Quality of Sweet Potato (*Ipomoea batatas* Lam.)

(CHANDINI, A. S.)

ABSTRACT

The study was conducted to find out the optimum spacing and nutrition levels in sweet potato at Department of Vegetable Science, College of Horticulture, Mudigere, during 2018-19. The experiment consists of three levels of spacing (40 × 20, 60 × 30 & 80 × 40 cm) and four levels of nutrition (50:25:50, 75:50:75, 100:75:100 & 125:100:125 kg NPK / ha) in all possible combinations were assessed for growth, yield and quality parameters. Among the different spacing and nutrition levels, S3 (80 × 40 cm) and F3(100:75:100 kg NPK / ha)recorded maximum vine length, number of auxiliary branches per plant, number of leaves per plant, vine girth, fresh and dry weight of leaves, stem and root, leaf area per plant, absolute growth rate, relative growth rate, net assimilation rate, total chlorophyll content, number of tubers per vine, tuber length, tuber girth, fresh and dry weight of tuber, tuber volume and tuber yield per plant. The maximum tuber yield per plot and tuber yield per hectare were obtained under closer spacing (40 × 20 cm) and F3 nutrition (100:75:100 kg NPK / ha) level. With respect to quality parameters, S2 (60 × 30 cm) spacing and F3 nutrition (100:75:100 kg NPK / ha) level recorded maximum values. Interactions of spacing and nutrition levels were found significant with respect to growth, yield and quality parameters. The treatment combination S3F3 (80 × 40 cm + 100:75:100 kg NPK / ha) recorded significantly higher values with respect to growth and yield. However, the maximum benefit cost ratio (3.90) was recorded in S2F3 (60 × 30 cm + 100:75:100 kg NPK / ha) treatment combination.

August, 2019

(V. Srinivasa)
Major Advisor

3. Genetic Variability Studies in F2 Segregating Population of Brinjal (*Solanum melongena* L.)

(CHITHRA, K)

ABSTRACT

The present investigation was carried out to understand the extent of genetic variability, correlation and path coefficient analysis between yield and its component traits in F2 segregating population of the two brinjal crosses viz., Surya×Harita and Swetha×Utkal Anushree at the experimental block of Department of Vegetable Science, College of Horticulture, Mudigere during the year 2018-19. The analysis of data indicated that the prevalence of sufficient genetic variation among the genotypes for all the characters. High heritability (>60 %) coupled with high GAM (>20 %) was observed for plant height, number of primary branches, plant spread from North to South, plant spread from East to West, fruit length, fruit diameter, average fruit weight, number of fruits per plant and fruit yield per plant in both the crosses indicating the involvement of additive gene action for these traits. Thus there is a ample scope for improving these traits through direct selection.

Correlation studies in both the crosses revealed that the number of fruits per plant, average fruit weight and fruit diameter had significant positive correlation with fruit yield per plant. Whereas, the characters days to first flowering and days to first picking showed negative and significant correlation. Path analysis for both the crosses for fruit yield per plant revealed that the fruit diameter, average fruit weight and the number of fruits per plant had high positive direct effect indicating the possibility of increasing fruit yield per plant by selecting these characters directly. The superior segregants identified with respect to fruit yield per plant in F2 segregating population of the cross Surya×Harita were P-10 (2.40 kg), P-15 (2.35 kg) and P-233 (2.03 kg). Whereas, in the cross Swetha×Utkal Anushree, P-16 (2.25 kg), P-19 (1.95 kg) and P-183 (1.92 kg) were identified as superior segregants, which can be utilized for further crop improvement programme.

August, 2019

(Devaraju)
Major Advisor

4. Effect of Bioregulators on Productivity of Sweet Potato (*Ipomoea batatas* Lam.) under Hill Zone of Karnataka

(SAHANA, D.)

ABSTRACT

An investigation on effect of bioregulators on productivity of sweet potato (Ipomoeabatatas Lam.) under hill zone of Karnatakawas carried out in the experimental block of department of Vegetable Science, College of Horticulture, Mudigere, Karnataka during 2018-19. The experiment was laid out in randomized complete block design with three replications consisting of different bioregulators viz., Gibberllic acid, Cycocel and Triacontanol at 250 ppm and 500 ppm.Biozyme, Biovita and Cytozyme at 0.3 % and 0.4%.The results showed significant differences among the treatments for various characters. Among different treatments, spraying of GA3 at 200 ppm recorded maximum vine length (176.00 cm), number of auxillary branches (5.73), number of leaves per plant (391.33), vine internodal length (6.03 cm), vine girth (17.80 mm), fresh weight of leaves (464.73 g), fresh weight of stem (216.10 g), fresh weight of root (1137.73 g), dry weight of leaves (77.33 g), dry weight of stem (36.21 g), dry weight of root (343.73 g),leaf area (22724.8 cm2/ plant), relative growth rate (0.02674 g / g / day), crop growth rate (39.40g / m2 / day), net assimilation rate (0.515 mg / dm2 / day),number of tubers per plant (6.20), tuber length (24.07 cm), tuber yield per plant (835.83 g), tuber yield per hectare (46.44 t), total sugar(2.25 %) content,crude protein (4.48 %) and β-carotene(0.43 mg /100 g) content. Maximum total leaf chlorophyll (2.68 mg / g)content,shelf life (33.22 days) under cold storage conditions and highest benefit cost ratio (3.61) wasfound with application of CCC at 500 ppm.

August, 2019

(V. Srinivasa)

Major Advisor

5. Studies on Spacing and Fertigation in Pole Type French Bean (*Phaseolus vulgaris* L.) under Protected Cultivation

(NEETHU, T. M.)

ABSTRACT

The present investigation entitled "Studies on spacing and fertigation in pole type French bean (*Phaseolous vulgaris* L.) under protected cultivation" was carried out during kharif 2018 at ZAHRS, Navile, Shivamogga. The experiment was laid out in split plot design with three replications. There were 18 treatment combinations comprised of three different spacing treatments (S1:60×75cm; S2:60×60cm; S3: 60×45cm) and six fertigation treatments [T1- 44:70:53 kg ha-1 (Control);T2-55:87.5:66.25 kg ha-1 (125% control); T3-33:52.5:39.75 kg ha-1 (75% control); T4- 44:70:53 kg ha-1 (control) + mulching + micronutrient spray; T5-55:87.5:66.25 kg ha-1 (125% control) + mulching+ micronutrient spray; T6-33:52.5:39.75 kg ha-1 (75% control) + mulching + micronutrient spray [IIHR Vegetable special 0.5 %]. The results of the experiment showed statistically significant difference among the treatments.However, highest number of primary branches (8.70), secondary branches (8.50),leaf area (6613.76 cm2), number of pods plant-1(220.02), number of clusters plant-1(6.50), pod length (20.66 cm), pod girth (2.95 cm), pod weight (17.69g), pod yield plant-1(4.65 kg), maximum soil nutrients, leaf macro and micro nutrients were recorded in theplants which was grown under thewider spacing of 60 × 75cm with the combination of 44:70:53 kg ha-1 (N:P:K), mulching and micronutrient spray. The maximum plant height (480.5 cm), pod yield (13.06 t) 1000 m-2 and B:C (2.48) ratio was recorded in the plants which was grown under the the closer spacing (60×45cm) with the combination of 44:70:53 kg ha-1 (N:P:K), mulching and micronutrient spray. Hence, it could be concluded from the study that, the closer spacing (60×45cm) with the combination of 44:70:53 kg ha-1 (N:P:K), mulching and micronutrient spray resulted in higher pod yield of pole type French beanand found economically profitable.

September, 2019 (Nagarajappa Adivappa)

Major Advisor

Forestry

Silviculture and Agroforestry

University of Agricultural and Horticultural Sciences, Shivamogga

M. Sc. (Forestry) theses abstracts produced in the

Department of Silviculture and Agroforestry

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1. Studies on Vegetative propagation Techniques in Diospyrosebenum J. Koieng: An Important Endangered Tree Species

VILASKUMAR

ABSTRACT

Diospyros is a large genus belongs to family Ebenaceae among which Diospyrosebenumis a valuable tree species native to India and Sri Lanka. The tree species of the family were slow growing in nature which grows up to 30m height. Wood of this species is known as black ebony and resistant to insect attack and fungi and export to China and Europe for furniture and fancy wood. The usage of the species made considerable loss in number and its frequency and categorized endangered as per IUCN. The vegetative propagation techniques plays important role in conserving such species when there is a problem of natural regeneration and recalcitrant seed to store for a year with improper germination envisage an alternate method of propagation. The present study was undertaken with an objective to identif suitable vegetative propagation techniques and determining the different concentration of IBA with air layering and different types of cuttings. The experiment was conducted at College of Forestry, Ponnampet with standard procedures using different concentrations of IBA, vegetative propagation methods viz., air layering, softwood cuttings, semi hardwood cuttings and hardwood cuttings. The findings of the research indicated the higher mean root number (6.16) in air layering treated with 2000 ppm of IBA. Rooting success (9.48%) in semi hardwood cuttings treated with 2000ppm of IBA with fresh shoot and root weight (0.46g and 0.43g. respectively).

November, 2019

(Maheswarappa. V.)
Major Advisor

2. Performance of Trees and Intercrops in Teak Based Mixed Plantation

(S. SHILPA SHENOY)

ABSTRACT

Agroforestry is gaining importance in the context of rising demand for wood coupled with availability of farm lands. Development of suitable tree crop combination and assessment of productivity is the major field to be considered in agroforestry. Present study was conducted with the objective to assess the performance of trees, intercrops and to study the impact of intercrop cultivation on soil nutrient status in teak based mixed plantation. Cowpea and green gram were cultivated in the interspaces of tree rows and also as sole crop. Results revealed that performance of teak with and without intercrop was on par. Average of growth parameters of Casuarinajunghuhniana and Albizialebbeckwere higher when grown without intercrops. Biomass of green gram and cowpea varied from 320.00 kg/ha to 666.67 kg/ha and 4733.33 to 6250.00 kg/ha respectively. Green gram as sole, failed to establish and as an intercrop it established but did not set the grain. The grain yield of cowpea ranged from 1228.26 kg/ ha to 3545 kg/ha wherein, sole crop recorded relatively higher value. Soil chemical properties at the beginning of the experiment revealed that they did not differ significantly between the treatments except organic carbon. Soil chemical properties between the different treatments consisting of only trees did not vary significantly. After the harvest of green gram there was significant difference in soil pH, CEC, available K and OC. After the harvest of cowpea CEC, available N, K and OC were significantly higher in the treatments wherein, trees and cowpea were cultivated together. Differences soil pH, EC, available P values between the different treatments was not evident. It was found that soil nutrients except N decreased due to cultivation of intercrops whereas, soil nutrients increased wherein no intercropping was done.

December, 2019

(Ramakrishna Hegde)
Major Advisor

3. Carbon stock assessment of prominent agroforestry practices in parts of Southern transition zone, Karnataka

(MITALI MEHTA)

ABSTRACT

Agroforestry plays an important role in global carbon cycle and regulating the earth's climate. Thus the importance of agroforestry as a sustainable land use system has received a wider recognition as an important strategy for adaptation and mitigation of global climate change. Present study was conducted with the objective of assessment of biomass and carbon stocks under different agroforestry practices in Periyapatana and Hunsurtaluk of Mysore district, Karnataka. The other important objective was to know about the carbon sequestration potential of different agroforestry practices in the region. Based on the reconnaissance survey four prominent practices viz; multipurpose trees(MPT's) on farmlands, block plantations, boundary plantations and control (i.e. agricultural crop without trees) were selected for the present study. The results revealed that the selected agroforestry systems have a great potential to sequester atmospheric carbon dioxide. Among the four practices, highest tree density, basal area, biomass, biomass carbon, Soil organic carbon stock, total carbon was recorded in block plantations followed by the MPT's on farmlands and boundary plantations, whereas lowest was recorded in control. Stems per hectare across different practices varied between 247 to 996 stems ha-1. The basal area ranged from 3.95 m2 ha-1 to15.51m2 ha-1. Total biomass and biomass carbon varied from 3.92 Mg ha-1 to 63.39 Mg ha-1, 1.84 Mg ha-1 to 29.79 Mg ha-1, respectively. The SOC stock ranged from 13.14 to 22.05 Mg ha-1.Total carbon stock and CO2e across the different practices ranged from 14.98 Mg ha-1 to 51.84 Mg ha-1 and 54.96 Mg ha-1 to 190.25 Mg ha-1, respectively. Based on these results it can be concluded that block plantations andMPT's on farmlands were found to be the suitable agroforestry practices for higher biomass production and carbon storage.

August, 2019

(G.M. Devagiri)
Major Advisor