

## **Ph.D**

### **Crop Physiology**

#### **Physiological Investigations on the Causes for Low Productivity in Drill Sown Rice**

**B. B. CHANNAPPAGAUDAR**

**1993**

**Major Advisor : Y. C. PANCHAL**

Experiments were carried out during *kharif* 1987 and 1988 at Agricultural Research Station, Dharwad, to evaluate the performance of diverse rice genotypes under drill sown and transplanted situations. The effect of planting density and genotypic adaptability to low light stress and also variability for rate of photosynthesis and translocation assimilates towards grains were studied. A total number of 82 genotypes comprising 20 each from early, medium and late duration groups and 22 high yielding varieties (HYVs) released in Karnataka were studied for their production potential under drill sown as well as transplanted situations and also the factors responsible for low yields under drill sown situation. The results of the screening study revealed that the medium duration group genotypes and HYVs performed better under both the methods of planting. The significant yield reduction was noticed under

drill sown situation irrespective of duration groups. The reduced yield under drill shown situation was due to the reduction of plant height, productive tillers/plant, nutrient uptake, all growth parameters and yield and yield attributes. Among the genotypes studied, A-67, IET-8111 and IET-9289 from medium duration group and Pragati from HYVs showed higher plasticity and adaptability under both the methods of planting. The optimum plant population for higher yield under drill sown upland situation of Malnad area is 75 plant per m<sup>2</sup>. The study revealed that less than 50 per cent of the normal light was most detrimental and resulted in greater reduction in yield. The genotypes with higher productivity per unit LAI had higher photosynthetic rate and exhibited greater translocation of carbohydrates towards grains.

### **Agricultural Entomology**

#### **Genetic Investigations on Midge, *Contarinia sorghicola* (Coq.) Resistance in Sorghum**

**MOHAN I. NAIK**

**1993**

**Major Advisor : I. G. HIREMATH**

A LXT (5x11) experiment was undertaken during *kharif*, 1991 at Main Research Station, Dharwad to elicit information on variability, heterosis, combining ability, nature of gene action, performance of different cross combinations for 27 characters related to sorghum midge resistance and grain yield. The same material was also tested for their stability over for environments, viz. at MRS, Dharwad

and Agriculture School, Devihosur, under two planting dates. Large amount of variation was observed for all the characters. Five crosses namely, SB101A x TAM 2566, PM7068A x PM14410-1, SB101A x DJ6514, SB101A x PM14358-7 and SB101 A x ICSV 745 over better parent and PM 068A x PM 14410-1 over the best parent were significantly negative heterotic for grain damage (caged). For

grain yield SB101A x DJ6514, SB101A x PM14358-7 and PM7068A x PM14410-1 exhibited positive significant heterosis over the best parent (ICSV 745). The combining ability analysis indicated the predominance of SCA than GCA variance for all the characters studied except ovary length, midge density, phenols and brix indicating the involvement of large portion of dominance and epistatic gene action. The pooled estimates of gca effects for resistance and yields revealed that PM 7061A, DJ6514, ICSV743, ICSV 745, PM14410-1 and

PM14358-7 were the superior general combiners. The cross SB401A x PM14410-1 followed by SB101A x D340 exhibited highest negative sca effects for midge damage. The relative performance for grain damage and yield characters, it was found that the combination RxR parents was the best and could be utilised for further breeding programme. Stability analysis across four environments revealed that GxE interaction were significant for all 10 characters studied except anther colour and tannin.

## Plant Pathology

### Integrated Management of Foot Rot (Wilt) of Black Pepper caused by *Phytophthora capsici* Leonian

K. SUBRAMANYAM

1993

Major Advisor : K. H. ANAHOSUR

The death of pepper vines was due to foliar, collar and root infection of *Phytophthora capsici*. The incidence of foot rot was observed in all the five villages surveyed in Uttara Kannada district of Karnataka. Integrated management of foot rot with the components, viz. neem cake, *Trichoderma* spp. (*T. viride* and *T. harzianum* and Ridomil MZ 72 WP in different treatment combinations revealed that the treatment, one kg of neem cake + 1.5 g of inoculum of *Trichoderma* spp. + one application of Ridomil MZ (@ 1.25g/l and totally 5 litres of spray solution/vine) was effective by reducing population of *P. capsici*. Next best treatment was three applications of Ridomil MZ at monthly interval in June, July and August. However, the application of neem cake or *Trichoderma* spp. alone was unable to reduce the population of *P. capsici* effectively and may become ineffective after some years. But their performance was fairly good when integrated with one application of Ridomil MZ. The introduced *Trichoderma* spp. multiplied well in the rhizosphere and their multiplication was enhanced when integrated with one application or Ridomil MZ indicating Ridomil MZ was compatible with *T. viride* and *T. harzianum*. Neem cake supported the multiplication of other fungi, bacteria and

actinomycetes in the soil. In another experiment conducted at Hulgol, Gadikai, Devarkoppa, Neernalli and Badalakoppa during 1989 and in Devarkoppa, Neernalli and Badalakoppa in 1990 in Uttara Kannada district of Karnataka revealed that three applications of Ridomil MZ (1.25 g/l and totally five litres of spray solution/vine) at monthly interval in June, July and August control the disease and reduce the population of *P. capsici*. Ridomil MZ increased the native population of *Trichoderma* spp. and bacteria and it was not having either stimulatory or inhibitory effect on other fungi and actinomycetes. Some of the wild pepper collections were least susceptible at 1% inoculum level of *P. capsici*. The saprophytic life of *P. capsici* prolonged under conditions of high soil moisture. Moist conditions supported growth and development of *T. viride* and *T. harzianum* but extreme dry and wet conditions were found unfavourable. Both *T. viride* and *T. harzianum* suppressed the population of *P. capsici*. The suppression was enhanced when neem cake was applied. The plant leaf extract of *Glyricidia maculata* was found to be most inhibitive to *P. capsici*. *Azadirachta indica* as green manure was found to be effective in suppressing population of *P. capsici*.

## Agricultural Economics

### Production and Marketing Performance of Oilseeds in Karnataka – An Econometric Analysis

S. M. MUNDINAMANI

1993

Major Advisor : K. N. R. SASTRY

Growth rates in area, production and productivity of oilseeds and factors influencing their production were examined in three major oilseeds growing districts of Karnataka. Market structure for oilseeds, the pattern of their arrivals and prices, marketing costs and margins under different channels were studied in six regulated markets of the study districts. Growth rates of area, productivity and production of oilseeds were negative during pre-green revolution period and positive during post-green revolution and overall periods. Among various price and non-price factors identified, price and yield of oilseeds and their competing crops and rainfall during sowing and growing months played a major role in oilseeds production. Market structure analysis revealed that oilseed trade was mostly controlled by a few big firms who were mostly wholesale traders-cum-oil processors. The arrival trend of oilseeds showed wide variations over the years, while a continuous

upward trend was observed in prices. Higher market arrivals and lower prices were observed immediately after harvest of the crop. Bombay oil market prices influenced the oilseed prices in study markets. Three marketing channels were identified, of which selling through commission agents was most popular in terms of number of farmers attached and the quantity sold. From the view point of marketing costs and margins, selling through co-operative marketing societies was most efficient. Selling through village traders was inefficient in terms of number of farmers attached, quantity sold and marketing costs and margins. It was concluded that production and marketing performance of oilseeds could be improved by streamlining the production and distribution of quality seeds, increasing irrigated area under oilseeds and encouraging co-operatives in integrating production, processing and marketing of oilseeds and their products.

## M.Sc. (Agri.)

### Genetics and Plant Breeding

#### Studies on Genetic Divergence, Character Association and Path Analysis in Drought Tolerant Rice (*Oryza sativa* L.) Genotypes

NEMAPPA G. HANAMARATTI

1993

Major Advisor : S. K. NADAF

Investigations were carried out during *kharif* 1990 and 1991 at Agril. Research Station, Mugad, *Kharif* 1991 at UAS, Dharwad and summer 1992 at ARS, Mugad to get an idea about genetic divergence, correlations between yield and its component characters and their direct and indirect effects on grain yield. The magnitude of  $D^2$  values as well as clustering pattern and composition varied

from season to season. There was no parallelism between genetic and geographic diversity. Of the 15 characters considered, days to 50 per cent flowering contributed mostly towards divergence in all seasons. Based on consistency of genetic divergence and *per se* performance, the parental combinations for hybridization were identified. Of the 120 character association comparisons, 24

and 54 pairs, respectively at phenotypic and genotypic levels had different associations in four seasons while other were homogeneous. In all four seasons, grain yield showed positive and significant associations with panicle length, days to 50 per cent flowering, panicle weight and fertile grains per panicle both at phenotypic and genotypic levels. Grain yield was negatively associated with per cent fertile grains and 1000-grain weight in three seasons while they had positive but non-significant associations

in upland conditions. Path analyses revealed that contribution of the characters towards yield apparently varied with seasons. However, days to 50 per cent flowering and panicle weight had considerable positive direct effects on grain yield irrespective of seasons. The traits, culm length, productive tillers and panicle exertion were important to be considered for selection in upland condition along with panicle weight.

### **Combining Ability Studies in Segregating Generations of Sorghum, (*Sorghum bicolor* (L.) Moench)**

R. MADHUSUDHANA

1993

Major Advisor : S. S. PATIL

The study was aimed to assess variability for combining ability in segregating generations ( $F_3$ ,  $F_4$  and  $F_6$ ) of a cross (3660B x MR-750), to determine consistency of combining ability and to determine the possibility of creating additional variability for combining ability by introducing a second stage recombination (in  $F_3$ ). Segregating lines  $F_3$  (97),  $F_4$  (69) and  $F_6$  (73) generations were crossed to 296A and the derived  $F_1$ s were mainly evaluated for yield and yield related characters. The derived  $F_1$ s corresponding to these generations revealed substantial increase in variability for combining ability (yield) and a sizeable portion of them revealed desirable transgressive segregation (over straight crosses) for combining ability and some were even better than commercial check (CSH-5). Many of the lines remained consistent in their combining ability. By using regression approach ( $b F_3$  on  $F_2$ ,  $b F_4$  on  $F_3$ ) on yielding ability of derived  $F_1$ s moderate heritability values (55 and 39%) were observed for combining ability. In these

generations *per se* performance of the segregating lines showed a moderate positive correlation with combining ability (derived  $F_1$  performance) indicating that inferior lines can be deleted in early generations. Twelve random  $F_4$  lines were crossed to 296A and to an additional tester 401A in Line x Tester fashion. Crosses involving 296A were superior to crosses involving 401A reflecting the influence of the tester's genetic constitution on variability for combining ability. When two  $F_3$  lines were crossed to SB-905 and their  $F_2$  segregants were crossed to 296A, the performance of these derived  $F_1$  populations indicated that it is possible to introduce additional variability for combining ability in segregating generations. Further the genetic constitution of  $F_3$  line influenced the magnitude of additional variability released by combining ability. The derived  $F_1$  populations revealed substantial variability even for some yield related characters studied in different generations.

### **Studies on Combining Ability, Heterosis and Fertility Restoration in Sweet Stalk Sorghum (*Sorghum bicolor* (L.) Moench)**

NAIK SUNIL B.

1993

Major Advisor : S. J. PATIL

Present study was carried out with an objective to evaluate sweet stalk sorghum for

grain yield, juice, total sugars and other related traits; to evaluate their hybrids and identify hybrid

suitable for different seasons and to study fertility restoration. Five 'A' lines and ten sweet stalk sorghum genotypes were the base material. The sweet stalk sorghum genotypes were crossed with each of the five 'A' lines to get fifty hybrids which were evaluated during *rabi* 1991 and summer 1992. Observations were recorded on seventeen quantitative characters. The data were analysed by Line x Tester design. Fertility restoration was confirmed by observing seed set. Specific combining ability variances were in magnitude for most of the traits in both the seasons. Female parent 2077A had highest general combining ability (gca) effects for 11 characters in both the seasons. Among males, SSV84 had high gca effects for 13 characters in *rabi*, whereas SSV12611 for 11 characters in summer season. Among the fifty hybrids, 2077A x

HES4 was the best for both grain as well as total sugar yield during summer season, whereas 2077A x SSV53 and 2077A x SSV74 were the best for grain and total sugar yield respectively during *rabi* season. Hybrid 296A x SSV96 was better for both grain as well as total sugar yield during *rabi* season. Hybrid 2077A x SSV 12611 performed better for grain yield in summer and total sugar yield in both the seasons. Hybrids 2077A x SSV53 and 2077A x SSV84 performed consistent for grain yield and total sugar yield respectively over both the seasons. The hybrids 2077A x SSV96 and 2077A x SSV84 had high fresh stalk yield during summer and *rabi* seasons respectively and 2077A x SSV12611 hybrid was better in both the seasons. All the genotypes restored fertility on  $A_1$  cytoplasm and maintained sterility on  $A_2$  cytoplasm.

## Agronomy

### Effect of Nitrogen, Potassium and Crushing Period on Juice Quality and Yield of Sweet Sorghum

C.B. TELI

1993

Major Advisor : M. D. KACHAPUR

A field investigation was carried out to study the effect of nitrogen, potassium and crushing periods on juice quality and yield of sweet sorghum at Agricultural College Farm, Dharwad during *kharif* 1991 under rainfed conditions. The experiment comprised 12 treatment combinations consisting of four nitrogen levels (0, 40, 80 and 120 kg N/ha) and three potassium levels (20, 40 and 50 kg  $K_2O$ /ha). At physiological maturity, plant samples from each treatment were drawn and crushed at five crushing periods (immediately after harvest, 4, 8, 12 and 24 hr after harvest). Application of 120 kg N/ha recorded higher grain yield (18.7 q/ha) and millable stalk yield (45.1 t/ha). Similarly, significantly higher grain weight and grain number per ear, plant height, stem diameter and total dry matter production and its distribution in stem, leaf and ear were recorded with 120 kg N/ha. Same trend was noticed with leaf area, LAI and LAD. Significantly

higher juice yield (12978 l/ha), calculated sugar yield (19.3 q/ha) and juice extraction per cent (42.08%) were recorded with 120 kg N per ha. The application of 40 kg N/ha was found optimum for most of the juice quality parameters. (*viz.* brix, pol sucrose, purity coefficient, pH, specific gravity, non reducing sugars and available sugar per cent). Grain yield, juice yield, calculated sugar yield and total dry matter production per plant were significant only upto to 40 kg  $K_2O$  per ha. Linear response was noticed between potassium levels and most of the juice quality parameters. Studies also revealed that calculated sugar yield and juice yield and their components did not show significant variation with crushing the stalks immediately after harvest and 4 hr after harvest. Crushing of stalks upto 8 hr after harvest has no much effect on pol sucrose and available sugar and upto 12 hr after harvest on reducing and non reducing sugars.

**Studies on Intercropping of Short, Medium and Long Duration Pigeonpea (*Cajanus cajan* (L.) Millsp) with Groundnut (*Arachis hypogaea* L.) In Vertisols of Transition Tract**

VIJAYAKUMAR KATTI

1993

Major Advisor : M. N. SHEELAVANTAR

A field experiment was conducted at Agricultural College Farm, Dharwad on medium black soil under rainfed conditions during *kharif* and *rabi* seasons of 1990-91 to study the effect of row proportions (3:1, 4:1 and 5:1) and pigeonpea genotypes (short ICPL 87, medium PT 221 and long duration GS-1) in intercropping of groundnut and pigeonpea on the growth and yield of the component crops, total yields and the economics of the intercropping system in relation to sole cropping or double cropping. There were 13 treatments nine inter cropping combinations of groundnut and pigeonpea and four sole cropping treatments (sole groundnut and sole ICPL 87, PT 221 and GS-1). After the harvest of sole groundnut, safflower was taken as second crop. Groundnut intercropped with short duration pigeonpea ICPL 87 produced significantly higher pod yield (18.6 q/ha) and haulm yield (19.13q/ha) than with medium PT 221 (15.14

and 16.08 q/ha) and long duration pigeonpea GS-1 (15.66 and 16.39 q/ha). So also was the case with yield attributing characters. Under intercropping system, ICPL-87 pigeonpea genotypes produced significantly lower seed (3.56 q/ha) and stalk yield (9.53 q/ha) compared to those produced by PT-221 (8.78 and 35.22 q/ha) and GS-1 (9.11 and 36.63 q/ha). The highest total seed yield (21.80 q/ha) and maximum LER (1.57) were obtained under 5:1 row proportion of groundnut and long duration pigeonpea genotypes (GS-1). However, maximum ATER (1.37) was obtained under intercropping combination of groundnut and short duration pigeonpea (ICPL-87) in 3:1 row proportion. The highest gross return (Rs. 28,238.00/ha), net returns (Rs. 20,649.10/ha) and benefit : cost ratio (2.72) were obtained under 5:1 row proportion of groundnut and long duration pigeonpea (GS-1).

**Control of Orobanche (*Orobanche cernua* Loeft.) in Bidi Tobacco (*Nicotiana tabacum* L.) by Soil Solarization**

SHANKAR S. METI

1993

Major Advisor : M. M. HOSMANI

A field experiment was conducted at Agricultural Research Station, Nipani during 1991-92 on the control of *Orobanche* in *bidi* tobacco by soil solarization with transparent polyethylene (TP) (0.05 mm and 0.10 mm thickness) for 10,20,30 and 40 days and black polyethylene (BP) for 40 days and these were compared with weedy, weed free and farmers' practice treatments. A laboratory study was also conducted at Main Research Station, Dharwar to study the effect of exposing *Orobanche* seeds (wet and dry) to high temperature (40 and 50° C) for 2 hours/day for different durations (2, 4, 6, 8 and 10 days). In the field experiment, soil solarization with transparent polyethylene significantly reduced the *Orobanche* weed count and weed

weight over BP. The TP 0.05 for 40 days effectively controlled *Orobanche* and other non-parasitic weeds compared to farmers' practice and other solarization treatments. Next best treatment was TP 0.05 for 30 days being on par with TP 0.1 for 40 days and farmers' practice. Soil solarization for shorter durations with TP and for days with BP were not effective in controlling *Orobanche* and other weeds. Significantly, higher cured leaf yield (1368.14 kg/ha) was obtained with TP 0.05 for 40 days compared to other solarization treatments and farmers practice (1206.15 kg/ha) due to higher *Orobanche* and non-parasitic WCE (78 and 81 per cent, respectively) lower weed index (10.97) higher leaf number and leaf areas. In laboratory experiment,

exposing wet *Orobanch*e seeds to 50°C for 10 days recorded significantly lower germination percentage. At 50°C temperature, wet seeds were most susceptible to heat killing compared to dry seeds.

Exposure to heat for 2-4 days increased the germination percentage but as the exposure period was extended germination percentage of *Orobanch*e seeds declined.

## **Soil Science**

### **Agricultural Utility of Flyash**

**B. HUSSAINSAHEB**

**1993**

**Major Advisor : C.V. PATIL**

Studies on the agricultural utility of flyash was carried out under field and laboratory conditions. Field study was conducted on irrigated red soils (Alfi sols) of Sagamakunta village, Raichur taluk during summer 1992. The experiment was laid out in split plot design with three main treatments as control- gypsum @ 500 kg ha<sup>-1</sup> and FYM @ 20 t ha<sup>-1</sup>. Flyash levels, 0, 10, 20 and 30 t ha<sup>-1</sup> were the sub treatments. Groundnut (cv. KRG-1) was grown as test crop. Laboratory incubation study was designed to understand the effect of amendments (gypsum and FYM) and Flyash levels on the fate of applied and native nutrients in soil. Application of amendments and flyash significantly increased the growth and yield of groundnut. The highest pod yield (36.6 q ha<sup>-1</sup>) was recorded due to application of flyash at 30 t ha<sup>-1</sup>. The increase in pod yield over control was 74.3 per cent. The uptake of NPK

and micronutrient by groundnut increased significantly due to application of amendments, particularly FYM along with flyash @ 30 t ha<sup>-1</sup>. Addition of different levels of flyash to soil altered the mechanical composition of soil towards increasing silt content. There was decrease in bulk density and increase in water holding capacity. Amendments failed to reduce the crust strength of soil, but flyash levels reduced the crust strength of soil significantly and helped to maintain it throughout the crop growth period. Significant reduction in soil pH and increase in the electrical conductivity of soil was seen with the application of amendments and different levels of flyash either individually or in combination, significantly improved the available N, P, K and micronutrient status of soil both under laboratory and field conditions.

### **Effect of Soil Salinity on Growth, Ionic Composition, Quality Parameters and Yield of Some Sunflower (*Helianthus annuus* L.) Genotypes**

**VIJAYA KUMAR**

**1993**

**Major Advisor : S. G. PATIL**

Twelve genotypes of sunflower were evaluated for salt tolerance under naturally existing saline conditions, by adopting single line screening technique. The genotypes included seven hybrids, viz. KBSH-1, MSFH-8, MSFH-17, BSH-1, ESH-1, ESH-2 and ESH-3 and five open pollinated varieties, viz. EC-310334, EC-310335, EC-310337, EC-68415 and Morden. The effect of soil salinity on germination,

growth, ionic composition, phenological and quality parameters and yield of different genotypes was compared at three levels of salinity, i.e. low (2-4 dS/m), medium (6-8 dS/m) and high (10-12 dS/m). The germination percentage was reduced by the salinity, but the reduction was low in BSH-1, KBSH-1, MSFH-8, MSFH-17 and Morden. The growth parameters such as plant height, number

of leaves, dry matter accumulation in various plant parts and total dry matter production were also decreased by salinity. Phenological parameters such as anthesis and maturity were delayed while, the grain filling period was shortened by the increasing salinity. Similarly, the quality parameters such as total soluble sugars and crude protein contents were also reduced at higher salinity levels. The grain yield was also adversely affected by the increasing salinity. The genotypes such as KBSH-1, MSFH-8, MSFH-17, EC-310334, EC-310335, EC-310337 and Morden showed a lower reduction

in seed yield and were found to be relatively salt tolerant. The tolerant genotypes accumulated relatively lower Na and higher K in various plant parts and showed higher K/Na ratios than the sensitive ones. The salt tolerant genotypes such as KBSH-1, MSFH-17, EC-310335 and EC-310337 characterised by higher yield maxima (Y<sub>m</sub>), higher threshold salinity (EC<sub>t</sub>) and lower slope were found suitable for cultivation under saline conditions. But the hybrids BSH-1, ESH-1, ESH-3 were found unsuitable for cultivation in saline soils due to their lower Y<sub>m</sub>, lower EC<sub>t</sub> and higher slope.

## *Horticulture*

### **Studies on Growth Flushes and Their Relationship to Flowering in Mango (*Mangifera indica* L.) Cv. Neelum and Totapuri**

SHRINIVAS D.SONNA

1993

Major Advisor : M. M. RAO

Studies on growth flushes and their relationship to flowering in mango Cv. Neelum and Totapuri in comparison with Alphonso were conducted at Silver Jubilee Orchard of Agricultural College, Dharwad, during January, 1991 and June, 1992. Two growth flushes in Neelum and four growth flushes in Totapuri were noted during 1991 calendar year, however, in Alphonso two growth flushes were noted. There was difference in their time of occurrence. The intensity based on visual observation was more in first flush. The shoots developed flowers in January, 1992 irrespective of their time of emergence in previous year in Neelum and Totapuri, while in Alphonso, only the shoots of first flush developed flowers which indicated that there was no clear-cut relation between shoot age and flowering in regular types. However, shoots of first flush produced higher percentage of flowering in all cultivars. Vigorous growth of newly emerged shoots of all flushes was noted immediately after

their emergence irrespective of the varieties; later on growth was marginal. There was no clear-cut relationship between physical parameters and flowering. Extension growth was noted in all the cultivars studied but flowering on extended shoots was noted only in Neelum and Totapuri. Primary growth (terminal or lateral) on fruited shoots or flowered but not fruited (FBNF) shoots was noted in all the cultivars but the flowering on terminal shoot was of higher magnitude as compared to lateral shoots. Spraying TIBA (100 ppm) and cycocel (500 ppm) resulted in induction of flowering directly on fruited shoots of previous year in Neelum and Totapuri, however, these chemicals did not show appreciable effect in Alphonso. Nitrogen content was more during fruit bud differentiation stage (FBD). Calcium was more in Neelum and Totapuri, while the role of phosphorous, potassium and magnesium was not clear.



## Crop Physiology

### Physiological Regulation of Dormancy of Groundnut (*Arachis hypogaea* L.)

PERLA VENU

1993

Major Advisor : M. B. CHETTI

To understand the physiological basis of dormancy and its effect on seedling vigour in both spanish and virginia genotypes of groundnut, laboratory experiments were conducted during 1991, after the harvest of the *kharif* crop. Pods were stored at room temperature upto 80 days after the harvest of the crop and during which various observations were recorded at 10 days interval. It was observed that whole seeds exhibited dormancy for a period of 20-30, 50-60, 70-80, 40-50 and 40-50 days in Dh-3-30, ICGS-30, DER, Bidar local and Mardur local, respectively. Whereas, embryos exhibited dormancy for a period of 40-50, 20-30, 10-20 and 20-30 days in ICGS-30, DER, Bidar local and Mardur local, respectively. Among the genotypes, embryos of Dh-3-30 did not show dormancy at any of the stages. Similarly, ethrel treated seeds didnot show any dormancy in all the genotypes. Unlike other genotypes, the spanish genotype, Dh-3-30 was confined to only fresh seed dormancy

due to presence of higher moisture content in the seeds. the germination parameters like GRI, BRI, CVG, MDG, PV and GV increased during post ripening period in all the genotypes and in all the treatments. Among these parameters, only BRI, CVG and GR values explained the lag phase in the germination. The GLC analysis of ethylene indicated that whether spanish or virginia type, only dormant seeds produced low amount of ethylene than the non-dormant seeds. Among different seed parts, embryonic axis produced a very high amount of ethylene followed by seed coat in all the genotypes. Among seedling vigour parameters, SVI values are more appropriate and the pattern of ethylene production was associated with seedling vigour. Embryos exhibited higher seedling vigour than the whole seeds. Whereas, ethrel treated seeds produced comparatively low root length, shoot length and seedling dry weight.

### Effect of Growth Retardants on the Growth, Physiology and Yield Potential of Sunflower (*Helianthus annuus* L.) Genotypes

SHASHIDHAR S. KULKARNI

1993

Major Advisor : M. B. CHETTI

A field experiment was conducted during summer 1992 at Agricultural College Farm, Dharwad, with a view to study the effect of growth retardants on growth, physiology and yield of sunflower genotypes. The experiment was laid out in randomised block (factorial) design with two genotypes (Modern and KBSH-1) and eight treatments comprising control (no spray), Malic hydrazide (250 ppm), TIBA (50 ppm), CCC (1000 ppm), mepiquat chloride (500 ppm) and mepiquat chloride (100 ppm). Treatments were imposed at 45 DAS in both the genotypes. Among the genotypes, KBSH-1 was significantly superior to Morden in almost all the

parameters studied. Among the treatments, Mepiquat chloride (100 ppm) had profound influence on morphological, growth, biochemical and yield parameters as compared with other treatments. While, other treatments did not produce any significant effect. The maximum reduction in plant height, number of leaves, stem dry weight, total dry weight at 55 DAS, leaf dry weight, leaf area, LAI at 65 and 75 DAS were observed in plants treated with mepiquat chloride (100 ppm). It was observed that AGR, CGR, RGR and NAR values were reduced at 55 DAS, and increased at harvest. With a significant increase in SLW, the SLA decreased

in the plants treated with mepiquat chloride (1000 ppm). The increase in the seed yield was attributed to a significant increase in the harvest index, number of filled seeds, 100 seed weight and significant decrease in the number of unfilled seeds. Mepiquat chloride (1000 ppm) produced highest increase in yield, i.e. 8.6 per cent followed by 1000 ppm CCC (2.6 per cent) and 500 ppm of mepiquat chloride

(2.2 per cent). The chlorophyll a, chlorophyll b, total chlorophyll and leaf nitrogen contents increased and soluble protein content of leaf decreased significantly in the treatment mepiquat chloride (1000 ppm) as compared with other treatments. However, it could not increase the seed protein and oil content significantly.

### Productivity Potential in Early and Late Cotton (*Gossypium hirsutum* L.) Genotypes Under Rainfed Conditions

RAJKUMAR BAMBARY

1993

Major Advisor : B. S. JANAGOUDAR

A field experiment was conducted to find out the physiological and biophysical basis of yield variation in 16 early and late cotton genotypes at the Agricultural Research Station, Dharwad under rainfed conditions. On an average early maturing genotypes produced higher seed cotton yield of 1160.9 kg ha<sup>-1</sup> as compared to late maturing genotypes (905.1 kg ha<sup>-1</sup>). Among the genotypes, NA-1339 produced significantly higher seed cotton yield (1383.6 kg ha<sup>-1</sup>). The higher yield obtained was mainly attributed to its close association with yield components and other characters such as fruiting points on monopodia ( $r=0.580$ ) and sympodia ( $r=0.691$ ), boll number ( $r=0.849$ ), harvest index ( $r=0.590$ ) and reproductive parts dry weight ( $r=0.608$ ). Genotypes showed significant difference in their growth pattern, phenological characters and

physiological parameters. Early genotypes possessed higher dry matter at all the growth stages mainly because of higher CGR, NAR and higher leaf area at early growth stage as compared to late maturing genotypes. Correlation studies showed high significant positive association of yield with NAR ( $r=0.615$ ) and specific leaf weight ( $r=0.8/10$ ) whereas, specific leaf area registered significant negative correlation with seed cotton yield ( $r=0.757$ ). With regard to biophysical characters, early maturing genotypes possessed moderate stomatal conductance and transpiration rate and also had less stomatal frequency and higher relative water content than late genotypes. It can be said that early cotton genotypes found morpho-physiologically efficient in terms of growth and yield parameters and biophysical characters.

### Agricultural Entomology

#### Ecobiology and Management of Sorghum Aphid *Melanaphis sacchari* (Zehntner)

B. S. PATIL

1993

Major Advisor : I. G. HIREMATH

Investigations on the biology, effect of temperature, varietal susceptibility, control of sorghum aphid, *Melanaphis sacchari* (Zehntner), toxic effect of insecticides on the coccinellid beetle and phytotoxicity of insecticides to sorghum plants

were carried out. The normal mode of reproduction in this aphid was vivipary. There were four nymphal instar occupying a total period of 102.4 hr. Longevity of the adult was 150 hr. Fecundity was 25.33 individuals per female. Total life cycle lasted for

251.4 hr. Among the three temperature levels 25°C was found optimum. First, II, III and IV instar nymphs developed in  $24.21 \pm 1.3$ ,  $24.00 \pm 0.94$ ,  $25.55 \pm 0.83$  and  $25.77 \pm 1.03$  hr respectively. Adult longevity and fecundity were 142.48 hr and 22.00 individuals, Life cycle was completed in 234.96 hr in case of apterous forms. Alate forms spent  $24.66 \pm 0.86$ ,  $26.30 \pm 1.58$ ,  $27.66 \pm 2.09$  and  $44.10 \pm 2.48$  hr at I, II, III and IV instars respectively. Adult longevity was 197.75 hr. Fecundity rate was 20.50 individuals per female. Total life cycle lasted for 303.75 hr. All the 80 sorghum genotypes screened for their susceptibility to the aphid were found to be susceptible to the aphid. Among 15 insecticides

tested on three released sorghum cultivars under field conditions, dimethoate (0.05%), methyl parathion (0.05%), endosulfan, (0.07%), chlorpyrifos (0.01%) sprays and malathion 5% dust (25 kg/ha) were superior to ashirwad, carbaryl (0.05%) and margocid neem leaf extract (10%). Insecticides which controlled the aphid, carbaryl, methomyl, dimethoate and methyl parathion were found toxic to coccinellid, (*Menochilus sexmaculatus* L.). Dimethoate, endosulfan, methyl parathion sprays and malathion dust resulted in higher yields. Methyl parathion, carbaryl, dimethoate sprays and malathion and BHC dusts exhibited phytotoxic effect on CSH 12 R, CSH 13 R and M 35-1.

### Evaluation of Poison Baits Against Lepidopterous Pests of Economic Importance in Karnataka

K. G. HIREMATH

1993

Major Advisor : I. G. HIREMATH

Experiments were conducted at Main Research Station, UAS, Dharwad during 1991-92 to evaluate the armyworm poison bait against lepidopterous pests on sorghum, maize, groundnut, sunflower, safflower, greengram, redgram, bengalgram and cotton. The contents of poison bait were modified to increase its efficacy as well as to reduce its cost. The poison bait consisting of 50 kg rice bran, 4 kg jaggery, 250 ml monocrotophos 36 SL and 6 to 8 litres of water was significantly superior to endosulfan spray in suppressing the larval population of *Mythimna separata* (Walker) on groundnut (42.52%); *Spodoptera litura* (Fab.) on sorghum (63.71%) and maize (61.82%); *Amsacta albistriga* (Walker) on groundnut (42.52%); *Spodoptera litura* (Fab.) on groundnut (50.23%), sunflower (58.83%) at one day after application and on cotton 78.02% and *Helicoverpa armigera* (Hubner) on bengalgram 60.65% at 10 days after application. The mortality of adult population of *M. separata*, *A. albistriga*, *S. litura*, *H. armigera*, *Plusia orichalcea* (Fab.), *P. signata* and *Lampydes boeticus* (Linn.) to the extent of 6675-7500, 250, 3775-10,000,

375-675, 1125, 1600 and 500 per ha respectively was observed only due to poison bait application. The endosulfan spray was superior to poison bait in reducing the larval population of *H. armigera* on redgram (to the extent of 5%) and safflower (5%), *P. orichalcea* on sunflower (5%) *P. signata* on cotton (22%) and *L. boeticus* on greengram (18%), while the bait was effective in killing adults of these pests. The bait was instrumental in reducing non-target pests, namely *Colemania sphenarioides* (Bol.), *Chrotogonus trachypterus* (Blanchard), *Streptogonopus jerdani* (Pocock), *Calocoris angustatus* Leth. and *Gonocephalum depressum* (Fab.) but found to be safer to the honey bees. Increasing of jaggery content by two times (8 kg) than standard check (4 kg) was superior in killing pests. Among the carriers evaluated, the rice bran was found to be most effective, though it was slightly costlier (Rs. 132/50 kg) than broken jowar, saw dust, groundnut shell powder, maize cob pith and paddy fine husk in controlling the larva and adult population of lepidopterous and non-target pests.

## Ecobiology of Promising Parasitoids of Sorghum Armyworm, *Mythimna separata* Walker

BASAVARAJ S. MALLASURE

1993

Major Advisor : K. A. KULKARNI

Among the different insect pests of sorghum, the oriental armyworm, *Mythimna separata* Walker is one of the serious pests which is attacked by 42 parasitoids, 16 predators and 12 pathogens. Among these *Cotesia ruficrus* Haliday and *Exorista xanthaspis* Wiedemann are the two promising parasitoids. The investigations were carried out on the biology of *C. ruficrus* and *E. xanthaspis* on natural host, *M. separata* revealed that the total life cycle (oviposition to adult emergency) occupied  $17.41 \pm 0.27$  and  $14.88 \pm 0.22$  days, respectively in case of both the parasitoids. The male to female sex ratio was 1.41:1.00 in case of *C. ruficrus* while 1:1.33 in case of *E. xanthaspis*. Among the several lepidopterous larvae exposed for parasitism, *M. separata* was preferred by both the parasitoids. The *C. ruficrus* preferred young (3-8 day old) larvae whereas *E. xanthaspis* preferred morning and evening hours

for maximum parasitisation of the host. Among the two mass multiplication methods tested, exposing larvae in lantern cages was found to be most suited for the multiplication of both the parasitoids. It was evident from field studies that endosulfan, carbofuran and monocrotophos bait gave 91.44, 88.26 and 87.21 per cent mortality as against 66.33 and 60.98 per cent in the case of malathion and phosalone dusts, respectively and proved their superiority after 72 hours of treatment. The field release of *C. ruficrus* at 2 lakh/ha proved its superiority in controlling armyworm among the three dosages tested in the preliminary release and recovery studies. Among the eight insecticides tested for their toxicity to both adults parasitoids, the fenvalerate and phosalone emerged as the safer insecticides.

## Plant Pathology

### Variation in *Colletotrichum graminicola* (Ces.) Wilson, Causing Anthracnose of Sorghum

RAVIKANT BASUTKAR

1993

Major Advisor : R. V. HIREMATH

The investigations on anthracnose of sorghum caused by *Colletotrichum graminicola* (Ces.) Wilson was undertaken with particular reference to variation in the isolates obtained from different locations in India. The culture of *C. graminicola* exposed to alternate cycles of light and darkness showed maximum growth and good sporulation. Non synthetic media supported good vegetative growth, whereas synthetic media were better for sporulation. Good growth of the fungus was observed at 30° C and 35° C with good and moderate sporulation respectively. Conidial germination on leaf surface of 20 sorghum varieties was studied. Maximum germination was observed in variety Kekri local and no germination was observed on TX-398 and TX-378. The disease developed fast

during first fortnight of October when the crop was 60-75 days old. Among the 43 Indian genotypes tested, none was immune to anthracnose. Seven varieties, 13 hybrids and 9 B lines were resistant. Eight isolates of *C. graminicola* from sorghum were collected from different locations of India. PNT isolate showed the maximum and UDR isolate showed minimum conidial length. Regarding the breadth of conidia, the range was very narrow. Maximum spore germination was observed in PNT isolate in all the media, whereas minimum germination was in AKL isolate. The utilization of five carbon sources by eight isolates of *C. graminicola* indicated that UDR isolate produced comparatively maximum dry mycelial weight in all carbon sources whereas least growth was observed in ICR isolate. Reaction

of 20 entries of ISAVN and five other lines against eight isolates of *C. graminicola* showed that variety D-340 was infected by all the eight isolates. Only four entries of ISAVN showed infection by one or

the other isolates. The results indicated that there is considerable variation in the isolates of *C. graminicola*.

## *Agricultural Microbiology*

### **Interactions of *Azospirillum* sp. and *Pseudomonas striata* or *Glomus fasciculatum* on Growth, Yield and Nutrient Uptake of Hybrid Cotton**

C. K. PRATHIBHA

1993

Major Advisor : A. R. ALAGAWADI

A study was conducted on the influence of *Azospirillum*, phosphate solubilizing *Pseudomonas striata* and a VAM fungus, *Glomus fasciculatum* in combination with chemical fertilizers and biogas spent slurry on growth, yield and nutrient uptake of a *desi* hybrid cotton under pot culture conditions. The results in general, indicated that cotton responds well to inoculation with test organisms showing better growth, higher dry matter and seed cotton yield over the uninoculated control. Application of 50% N to *Azospirillum* or *Azospirillum* + *P. striata* enhanced plant growth, yield and N uptake over the respective treatments without nitrogen. Dual inoculation of *Azospirillum* and *P. striata* with 100% P as rock phosphate showed significantly higher yield over single inoculation of *Azospirillum* + 100% P as super phosphate. Similarly, inoculation of *P. striata* + 100% N + 100% P as rock phosphate showed significantly higher yield and nutrient uptake over recommended dose of fertilizers. Dual inoculation

of *Azospirillum* and *P. striata* with 50% N and 100% P as rock phosphate was found to be the best combination showing highest yield and nutrient uptake. Biogas spent slurry further improved the performance of all the inoculants. The rhizosphere microbial population was enhanced due to inoculation of *Azospirillum*, *P. striata* and *G. fasciculatum* with or without fertilizers and spent slurry. Combined inoculations showed enhanced population over single inoculation treatments. The population of bacteria, actinomycetes and free living nitrogen fixers was highest in the treatments receiving *Azospirillum* + *P. striata* + 50% N and 100% P as rock phosphate. *G. fasciculatum* inoculation enhanced the rhizosphere fungal population and also showed highest spore count and per cent root infection. The population of P - solubilizers and *Azospirillum* was generally higher in treatments receiving inoculation of the respective organisms.

M. Sc.

**Agricultural Economics**

**Economics of Cropping Systems In Malaprabha Command Area (Karnataka State)**

M. B. KOPPAD

1993

Major Advisor : H. S. S. KHAN

The focus of the study is on the economic evaluation of cropping systems in different regions of the canal command area. A sample size of 120 farmers was selected using multistage random sampling method. Field level data for the agricultural year 1991-92 were collected through the survey method. Cotton as a sole crop and *kharif* maize followed by *rabi* wheat were the important cropping systems followed by large and small farmers in all the regions. More areas were diverted to biseason crop cotton than the recommended level in all the crops. The cotton yield (q/ha) was the highest in mid reach (17.26) followed by head reach (14.4) and tail reach (11.86). The maize yield (q/ha) was the highest in head reach (47.10) followed by mid reach (40.69) and tail reach (35.45). There were no much differences observed in the yield levels of wheat. Cotton was found to be more profitable crop in all the regions with net income of Rs. 2770.59 per ha. It was highest in the mid reach followed by head reach (Rs. 26252.63/ha) and tail reach (Rs. 13103.16/ha), and from maize -wheat

system it was highest in the head reach (Rs. 15238.71/ha) followed by tail reach Rs. 11767.10/ha) and mid reach (Rs. 9925/ha). The total cost (Cost C) was more in the mid reach for both the systems. The benefit-cost ratio was higher for cotton in all the regions. Large farmers realised higher income than small farmers. The net income (Rupees/ha) realised from maize - sunflower system was Rs. 10592.11 and from *rabi* jowar Rs. 4368.46 on large farms. The production function analysis revealed that the cost incurred on plant protection chemicals in head reach, bullock labour in tail reach for cotton, human labour and fertilizers in head reach, human labour in mid reach, bullock labour and seeds in tail reach for maize, bullock labour in all regions and human labour in tail reach for wheat were higher than warranted. Inadequacy of water was the main problem encountered by tail reach farmers which can be overcome by following the recommended cropping system, establishment of water users co-operative societies and implementing warabandi system.

**Evaluation of Groundnut Processing Units and Marketing of their Products in Cuddapah District, Andhra Pradesh**

K. V. SESHIAIAH

1992 Major Advisor : H. S. SADAT ALI KHAN

The objective of the study was to analyse the economics of groundnut processing units and marketing of oil in the Cuddapah district of Andhra Pradesh. The data were collected during the year 1989-90 from a random sample of 16 oil mills. And, market intermediaries. The data were collected by survey method with the help of schedules designed for sample respondents. The technique of tabular

analysis and business ratios were employed in this study. The results indicated that the processing costs per quintal of oil production are low in categories II (Rs. 2,606) and III (Rs. 2,536) oil mills. This led to the highest net returns (Rs. 162 and Rs. 210). Category-I oilmills, on account of more salaries, wages and repair charges incurred more processing costs (Rs. 2,696) and low net returns (Rs. 105).

The return on total capital employed was Rs.0.03 on category-I and Rs. 0.08 on category-III oil mills. The total asset turnover was Rs. 17 in category-I and Rs. 33 in category-III oilmills. The return on assets was Re. 0.66 in category-I and Rs. 2.50 in category-III. The net profit margin was 3.77 per cent in category-I and 7.64 per cent in category-III. The benefit cost ratio was 1.04 in category-I and it was high at 1.08 in category-III oilmills. Thus, the business ratios indicated that category-III oilmills are more efficient than that of categories I and II. The oil recovery performance was comparatively more in category-III oilmills

than in categories I and II. Price spread study showed that the producer's share in the consumer's rupee was 90.77 per cent in channel-II and 88.85 per cent in channel-I. The opinion survey revealed that all the oilmills are facing problems of frequent price fluctuations of raw materials, irregular power supply, lack of modernisation of machineries, non-availability of labour. It could be concluded that modernisation of the processing units and adoption of improved processing techniques can significantly reduce unit cost of processing besides improving oil recovery percentage.

### **An Economic Analysis of Cropping Systems in Tungabhadra Project Command Area (Karnataka)**

T. NAGARAJ

1993

*Major Advisor : H. S. S. KHAN*

The present study aims at evaluating the economics of prevailing cropping systems in different locations of the canal command. A sample of 120 farmers was selected using multi-stage random sampling method. The data were collected for the agricultural year 1991-92 through survey method. The techniques of tabular and functional analyses were employed. Sole crops of cotton, paddy and the sequences of maize - sunflower, jowar - sunflower and groundnut - sunflower were the important cropping systems followed in the study area. About 22 per cent of the net cropped areas deviated from the recommended cropping system. The per hectare net profit from cotton was the highest in middle reach (Rs. 23,335) and lowest in tail reach (Rs. 14,637). The net profit realised by the head reach farmers was more (Rs. 14,031) than that realised by the middle reach farmers in case of paddy. The per hectare profit from maize - sunflower system was the highest in the middle reach (Rs. 12,246) and lowest in tail reach (Rs. 11,276). In

case of cotton, the profit increased with the increase in size of holding, whereas it decreased with the size of holding in case of paddy, maize - sunflower, jowar - sunflower and groundnut - sunflower cropping systems. Cotton was the most profitable crop in the command. The net profit per hectare was maximum for cotton (Rs. 21,694) followed by groundnut - sunflower system (Rs. 16,628), paddy (Rs. 12,858), jowar - sunflower system (Rs. 12,236) and maize - sunflower system (Rs. 12,011). The benefit - cost ratio was highest for cotton (2.51) and lowest for maize - sunflower system (1.95). The production function analysis revealed that in majority of the cases, the cost incurred on manures and fertilizers was more than warranted. Land was over - utilised only in case of groundnut. Majority of the tailenders (85 per cent) were facing the problem with the availability of adequate irrigation water which can be solved though the efficient maintenance of the irrigation water distribution system.

## **Performance of the Karnataka Co-operative Oil Seeds Growers' Federation Limited – An Economic Analysis**

**DAYANAND HEGDE**

**1993 Major Advisor: H.G.SHANKARA MURTHY**

The performance of the (Karnataka Co-operative Oilseeds Growers Federation Ltd.) KOF using a variety of both traditional and modern analytical techniques for the time series data for seven years was analysed (1984-85 to 1990-91). An opinion survey was conducted to collect primary data from three different categories of 156 respondents drawn at random from the KOF, three unions and ten sample member societies. The compound growth rate analysis was employed to evaluate the 21 physical and 15 financial growth and development of the KOF. The principal component analysis was employed to analyse and evaluate the performance of the KOF, while the cluster analysis technique was used to assess the working of the KOF as well as the unions and member societies on the basis of the scores obtained for selected variables. The SWOP (T) management

technique was adopted to identify the strong and weak areas of the KOF in its functioning and specify the opportunities to overcome the weaknesses. The volume of business of the KOF substantially expanded and diversified to a greater extent. Some financial ratios revealed the sound financial structure of the KOF, but some did not. The performance of the processing and packaging units of the KOF generally incurred losses. The KOF lent both organisational support and infrastructure facilities. The results of the principal component analysis, cluster analysis and SWOP (T) analysis corroborated many findings of other techniques of analysis. Appropriate strategies have been suggested to reinforce the strong areas of the KOF and to remedy the weak areas and to make it much more socially responsible organisation than what it is today.

## ***Agricultural Extension***

### **A Study on Job Satisfaction of Agricultural Assistants Working under National Agricultural Extension Project in Karnataka State**

**SHANMUKHAPPA K. MENASINAHAL**

**1992**

**Major Advisor : L. MANJUNATH**

The study was conducted during 1992 involving 150 Agricultural Assistants of randomly selected six talukas of Dharwad district, to measure their job satisfaction level, to identify personal and socio - psychological factors related to their job satisfaction, to know their opinion about functioning of NAEP and to obtain suggestions for improving NAEP. The important findings were, 45.33 per cent of respondents had medium level of job satisfaction, middle aged, educated upto S.S.L.C., had medium total experience, high NAEP experience. Majority of respondents had undergone 1 to 4 trainings during their tenure of service, had more rural background, had favourable attitude towards

their job, perceived organisational climate as medium, had medium, had medium organisational stress and majority of them were regular readers of daily newspapers. Significant association was found between job satisfaction and job attitude and organisational stress. There was significant mean difference between job attitude, organisational stress, opinion about functioning of NAEP and their level of job satisfaction. Majority of the respondents felt that earlier programme was better, expressed that there is no recognition and status, and NAEP had created good administrative climate. Suggestions given by the Agricultural Assistants for overall improvement in the situation include, new varieties



of crop should reach farmer in time, along with agricultural subject other allied subjects should also be taught during subject matter trainings,

more number of demonstrations should be undertaken and programmes should not be changed too frequently.

**A Study on Paddy Cultivation Pattern of Siddhi Farmers and Their Socio-economic characteristics, Yellapur Taluka, Karnataka**

**ARUN M. BALAMATTI**

**1993**

**Major Advisor : L. MANJUNATH**

The study was conducted during 1991-92 in Yellapur taluk of Uttar Kannada district to know the pattern of paddy cultivation followed by Siddhi farmers, their socio-economic characteristics, aspirations value-orientation towards scientific farming, to identify the problems encountered by them and the suggestions to overcome the same. Out of 72 settlements in the taluk, 13 were selected on population basis and all the available paddy farmers were collected using structured, pre-tested schedule and analysed using mean, standard deviation, percentages and 't' - test. It was revealed that majority of the local paddy - variety growers applied FYM, while none followed plant protection measures. Recommended seedrate, sowing time, spacing and FYM application were the practices followed by improved variety growers, who also applied chemical fertilizers. Significant difference was noticed between the mean yields obtained from

local and improved varieties. Lack of finance, huge trees in the fields, pests and diseases were the constraints in raising paddy yield. Majority of the respondents were middle aged, illiterate, married, had a large nuclear family, were small and marginal farmers with medium income, had low cosmopolitaness, social participation, massmedia participation, extension contact, had medium aspirations and high value-orientation towards scientific farming. The mean difference in the aspirations of local and improved variety growers was non-significant but was significant with respect to their value-orientation. Lack of infrastructural facilities, regular employment, low wages were the problems encountered while legal title to encroached lands, infrastructural facilities and regular work opportunities were the suggestions by the respondents for improvement in their living conditions.

**Job performance and Job satisfaction of Anganwadi Workers of Gadag and Ranebennur Taluks, Dharwad District**

**VIJAYALAXMI M.**

**1993**

**Major Advisor : L. MANJUNATH**

The study was conducted in the year 1992 involving 160 (AWWs) Anganwadi workers of Dharwad District, revealed that majority of respondents had medium level of job performance and job satisfaction. High vs low job performance and job scores, respectively. Majority of respondents had medium level of job attitude, achievement motivation and knowledge about basic facts of nutrition. High vs low job attitude and achievement

motivation categories of AWWs differed significantly with respect to their mean job performance and job satisfaction scores. Majority of respondents belonged to 25 to 35 years of age group, studied upto S.S.L.C., had above five years of experience and received one in-service training. Considerable percentage of the respondents were reading newspaper and listening radio programmes on women occasionally. Whereas 41 per cent of them

were not viewing women programmes on television. Majority of the respondents had medium level of sociability. Characteristics like attitude and achievement motivation had positive and significant relationship with job performance and job satisfaction. Job performance was positively and significantly related with job satisfaction. Less honorarium to

AWWs, no own Anganwadi building, problem of fuel for the centre and lack of pre-school equipments to Anganwadi centres were the important problems encountered by the respondents. They suggested that the above conditions should be improved in order to enhance the performances of the Anganwadis.

## **M.H.Sc.**

### **Life Satisfaction Among the Elderly Retired Women**

**SUDHA S. RAYANAGOUDAR**

**1993**

*Major Advisor : V. GAONKAR*

A study on life satisfaction among the elderly retired women was carried out in Hubli and Dharwad city during January to April 1992. Seventy nine retired women teachers, belonging to the age group of 61 years and above, who had passed minimum of two years of retired life and married were interviewed. Ramamurthi's (1978) Adjustment Inventory and Life Satisfaction Index-A were used to measure the adjustment and life satisfaction of the elderly people. Religious activities of the respondents were measured using the scale developed by Hosmath (1992). Correlation co-efficient, Z-test and analysis of variance technique were used for analysing the data. The results showed that more than half of the elderly retired women were moderately satisfied in life and only 15.2 per cent of them were highly satisfied. Age of the elderly

retired women was significantly and negatively correlated with life satisfaction, health status, family relationship and leisure time activities. As age of the elderly retired women increased their level of life satisfaction decreased. A non-significant difference in the life satisfaction of the elderly retired women according to the educational level and marital status was observed. The elderly retired women who belonged to Hindu religion and who were living in nuclear family were more satisfied in life. Health status, financial position, social and religious activities of the elderly retired women were positively and significantly related to life satisfaction. Relationship with family members and leisure time activities of the elderly women were positively related to life satisfaction. However, the relation was not statistically significant.

### **Nutritional and Biochemical Profile of Smokers and Non-smokers**

**HEMALATHA S.**

**1993**

*Major Advisor : SHARADA G. S.*

A total of 50 smokers and 50 non-smokers between 21-28 years of age from the College of Agriculture, Dharwad were covered for the investigation during 1991-93. Food intake was assessed by three-day - 24 hour recall and nutrient intake was computed. Per cent adequacy of foods, nutrients

and Dietary Nutrition Index (DNI) were calculated by comparing with the recommendations given by the Indian Council of Medical Research. It was observed that intake of all the foods excepting green leafy vegetables was sufficient in non-smokers, while intake of all the foods was higher in smokers.

Protein, energy and vitamin C was adequate among smokers and fat, calcium, iron, thiamine and riboflavin were more than adequate. Non-smokers had adequate intake of all the nutrients except carotene, which was inadequate among both the groups. Number of years of smoking had an adverse effect on DNI.  $\beta$ - lipoprotein and total cholesterol were high and  $\alpha$ - lipoprotein low among smokers as compared to non-smokers. Protein fractions did not vary much between the two groups and number of years of smoking had relation on lipoprotein levels. Among smokers, weight was related to lipoprotein and  $\beta$ -protein and among non-smokers

mid arm circumference and fat fold thickness and weight/height<sup>2</sup> and weight for height indices were less among smokers as compared to non-smokers but were non-significant. DNI has a relation on anthropometric measurements excepting height in case of smokers. Socio-economic status was not significantly related to food intake, nutrient intake, anthropometry and biochemical estimations of both the groups as majority were hostelites. Frequency of alcohol intake was significantly related to lipoprotein levels, but not to food intake, nutrient intake and anthropometry.

### **Sex-Role Perception of the Adolescents – Personal and Familial Correlates**

MANGALA V. PATIL

1993

*Major Advisor : V. GAONKAR*

The study was carried out in Dharwad and Hubli cities during 1992. The sample comprised 360 adolescents (both boys and girls), studying in eighth, ninth and tenth standards. Equal number of adolescents (180 each) was selected from both English and Kannada medium schools and single-sex and co-education schools. The main objective of the study was to see the influence of various personal and familial factors on sex-role perception of adolescents. The data collected through the standard questionnaire was subjected to correlation co-efficient analysis, chi-square test, 'Z' - test and step-down regression analysis. The results revealed that relatively a larger proportion of the respondents had conservative sex-role perception. Significant association was found between gender and sex-role perception. Girls were more liberal than boys in attitudes toward sex-roles. The adolescents having good self concept, high achievement motivation

and high academic performances were more liberal in sex-role perception. It was interesting to note that the adolescents of single-sex schools were more liberal compared to those of co-education schools. The adolescents who were first borns and who belonged to the families having only female children were more liberal in perception. The adolescents whose fathers had high educational and occupational background and who belonged to the family having high social and economic status were also liberal in sex-role perception. It was surprising to note that the adolescents of joint families and whose grand parents were staying with them had liberal sex-role attitudes. The factors which did not significantly influence the sex-role perception of the adolescents were age, medium of instruction, religion, size of the family and education and occupation of mother.