

**Growth and Development Dimensions of Regional Rural Banks in Karnataka**

S.N.V. KRISHNA

2000

MAJOR ADVISOR: Dr. S.B. HOSAMANI

The character of Indian agriculture had changed a lot over decades with modern capital intensive agriculture gaining importance that compelled the farmers to go for external credit. Realizing this necessity and to protect the farmers from money lenders exploitation, the Regional Rural Banks came into existence in 1975 based on the M. Narasimham committee recommendations. But, recently these banks started incurring heavy losses and hence a study attempted to assess the performance of RRBs assumes significant importance which will indirectly help the farming community.

The present study was initiated against this background with the broad objective to analyze the performance of RRBs taking different aspects into consideration. The thirteen RRBs operating in Karnataka were selected for the study. Besides this to elicit the opinion of borrowers, multistage random sampling method was followed and eighty borrowers were interviewed.

The exponential function was used to calculate the growth rates of selected indicators. The Markov Chain

analysis and Theil's entropy were used to analyse the pattern of credit flow which showed that short term loans were the activity that received maximum attention from most of the banks. Simple tabular analysis was used to analyze the different dimensions of overdues and found that the overdues were high in the case of agricultural activities. Principal component analysis was used to aggregate the numerous indicators into few factors that have bearing on the performance of the banks and to arrive at component index for the purpose of ranking the banks. It was found that Tungbhadra Grameena Bank, Malaprabha Grameena Bank, Cauvery Grameena Bank, Kolar Discriminant function analysis was used to identify the characters that can discriminate significantly between the two groups and found that employee per branch had contributed much to the distance between two groups followed by credit-deposit ratio and income to expenditure ratio. Multiple regression analysis was used to quantify the influence exerted by selected variables on the profitability (Net profit to working capital) of banks and found that spread and burden had significant influence on the profitability.

**Economic Analysis of National Watershed Development Programme for Rainfed Area in Bidar District**

ANAND S. SINDAGI

2000

MAJOR ADVISOR: Dr. L.B. HUGAR

The dryland area occupies prime position in Indian agriculture as it contributes about 44 per cent of food basket by occupying 67 per cent of arable (143 million ha.) land. However, soil erosion, land degradation and deterioration are threatening the sustainability of agriculture for which development of land on watershed approach is most ideal. National Watershed Development programme for Rainfed Area (NWDPA) is one of the such programmes for development of dryland agriculture in the country, and one of it is implemented in Bidar district, Karnataka since 1993-94. For evaluation of watershed programme, Aliamber village which covers the entire watershed area and Janawada village (non-treated area) with sample farmers of 40 each were randomly selected. The Cobb-Douglas type of production function and decomposition analysis were employed to find out contribution of watershed treatment over non-watershed area. The project evaluation technique was used to test

the viability of investment in watershed development.

The watershed development had brought the changes in land use pattern with the total cultivation area in watershed area (74.20%) being higher than that of non-watershed area (58.57%). The cropping intensity was also higher (137.88%) in watershed area, compared to non-watershed (117.28% area). The input use, cost incurred and returns obtained in all the crops under watershed area were higher than those of non-watershed area. The total human labour employment generated in watershed area (7460.60 man days) was also found to be higher (72.71%) than that of non watershed area (4319.72 man days). The investment in watershed development proved to be economically viable with the favourable net present worth (Rs. 13,03,439), benefit cost ratio (3.03), internal rate of return (84%) and pay back period (2 years) for the watershed area as a whole.

## HORTICUTLURE

### Genetic Divergence, Heterosis, Combining Ability and Resistance Breeding in Okra (*Abelmoschus esculentus* (L) Moench)

SURESHKUMAR

2001

MAJOR ADVISOR: R. M. HOSAMANI

Evaluation of okra germplasm for variation and divergence on black soil under rainfed condition and studies on heterosis, combining ability and resistance breeding for a biotic stresses (Yellow Vein Mosaic Virus, Powdery mildew and fruit borer) under irrigation on red soil were conducted during 1999-2000 at the Olericulture Unit, Department of Horticulture, College of Agriculture, Dharwad.

Germplasm consisting of 180 genotypes from distinct geographical region were evaluated in *kharif* 1999. There was considerable variation among the genotypes for 15 characters studied. GCV and PCV were higher for most of the characters except days to edible maturity and days to first flowering. High heritability and GAM was observed for all the characters except days to edible maturity.

Correlation study revealed that yield had significant and positive association with all the characters except inter-nodal length, fruit length, number of ridges on fruit and days to edible maturity. Path analysis indicated that number of fruits per plant, fruit weight, plant height, number branches per plant and days to 50 per cent flowering were important yield components which need to be given weightage in selection. Eighteen divergent clusters were formed following  $D^2$  analysis. Inter-cluster distance between clusters XVIII and remaining clusters in general were high. Improvement in yield per plant, number of fruits

per plant and shorter inter-nodal length can be brought by selection of genotypes from cluster XVIII as it has high inter cluster distance and high desirable means for above said traits.

Evaluation of  $F_1$  hybrids along with parents of 5 x 5 half diallel cross without reciprocals in summer 2000 revealed that significant heterosis was noted for all the characters over better parent and standard check, YVMV immune cross Arka abhay x Arka Anamika and Arka abhay x Pusa Sawani were high yielders and showed significant standard heterosis for number of fruits per plant and yield per plant. These produced consumer preferred 5-6 ridged, downy and green fruits. Majority of cross combinations involving parents of high x low combiners had high sca effects. Thus, crosses having high sca effects are not necessarily the product of only parents of high gca effects.

Parents Arka abhay, Arka Anamika were good general combiners for yield per plant, number of fruits per plant and YVMV resistance. The cross combinations derived either by Arka abhay or Arka Anamika or combination of these two were found to be resistant to YVMV. Based on pooled analysis Arka Anamika showed a high gca status and hence can be utilised as a potential source for heterosis breeding. Heterosis in relation to parental divergence revealed that the magnitude of  $F_1$  heterosis was not necessarily corresponding to parental divergence.

### Genetic Divergence, Generation Mean Analysis and Stress Resistance Breeding in French Bean (*Phaseolus vulgaris* L.)

RAJESH B. GOVANAKOPPA

2001

MAJOR ADVISOR: R. M. HOSAMANI

Investigation on genetic diversity among sixty two genotypes, gene effects in four crosses and heterosis in relation to parental divergence on french bean was carried out under rainfed (stress) condition on black soil at Department of Horticulture, College of Agriculture, Dharwad during *kharif* season of 1999. Sixty two genotypes were used for the study of variability and diversity in french bean for eleven characters. High GCV and PCV values were recorded for reproductive branches per plant, 100 seed weight and green pod yield per plant. High heritability and genetic advance was recorded for most of the characters studied except days to flowering, plant height, pod width and seeds per pod.

The study of character association had revealed that plant height, pod breadth and pods per plant have positive and significant correlation with yield. Study of path analysis had shown that pod breadth, 100 seed weight

and pods per plant have maximum positive and direct effect on green pod yield per plant.

Eleven clusters were formed following  $D^2$  statistics with Tocher's method. Pods per plant, 100 seed weight, plant height and reproductive branches per plant have contributed more than 90% to the total divergence. Higher inter cluster distance was noticed between cluster X and XI, while higher intra cluster value was noticed in cluster II. Eleven clusters were formed following  $D^2$  statistics with Tocher's method. Pods per plant, 100 seed weight, plant height and reproductive branches per plant have contributed more than 99% to the total divergence. Higher inter cluster distance was noticed between cluster X and XI, while higher intra cluster value was noticed in cluster II.

Four different inter varietal crosses comprising of  $F_1$ ,  $F_2$  and  $F_3$  with their four parents were evaluated for the study of gene effects using generation mean analysis. Non-allelic digenic interactions were observed for all the characters. Additive gene effects were predominant for plant height and pod width, to improve these traits simple selection of transgressive segregants was suggested. Dominance gene effects were predominant for vegetative branches per plant, reproductive branches per plant, pod breadth, green pod yield per plant and seeds per pod, to

improve these traits biparental mating was suggested. Pod length and pods per plant were found polygenic in nature, therefore depending on the gene action prevailing in the crosses suitable breeding method had been suggested.

Four inter varietal crosses were used for the study of heterosis in relation to parental divergence. It was concluded from the result that high heterosis was shown with the cross having parents derived from lesser divergence.

## FORESTRY

### Management Strategies for Root and Heart Rot in *Acacia mangium* Willd

M. PRASAD

2000

MAJOR ADVISOR: Dr S.T. NAIK

*Acacia mangium* is fast growing tree species, extensively growing in the southern states of India because of its multifarious uses and land area benefits. Among various biotic factors that limit the successful establishment and production of the crop, root rot and heart rot caused by a complex group of pathogens. Survey for root and heart rot conducted during May 1999-Feb 2000 in the three bioclimatic zones of Karnataka indicated that maximum incidence of root rot (35.75-37.23 per cent) and heart rot (33.32-33.53 per cent) was recorded in zone II.

Pathogens associated with root/heart rot belonged to *Sclerotium rolfsii* and *Ganoderma lucidum* which were identified based on cultural characters and *Merulius aureus*, *formis pachyphloeus* and *Trametes sepium* were identified based on the morphological characters of fruiting bodies.

The direct influence of disease management treatments on mortality per cent indicated that soil drench with 0.1 per cent Calixin (T8) was effective and *Trichoderma viride* and *Pseudomonas fluorescens* is pasted on wounds

colonized and prevented the entry of pathogens.

Growth parameters such as proportion of dead branch to living branch to total height was maximum in T1 and T4 (0.311 and 0.190 respectively). While in other treatments either it was lower or increased slightly in T2 and T10 (0.266 and 0.288 respectively). Per cent increment was highest in T2 treatment while it was the least in T1 and T4 treatments. Heart wood discs baited maximum amount of pathogen and per cent disease incidence. The regression equation  $Y = 4.89 + 0.271x$  suggested that for every one per cent colonization there was an increase in disease by 0.271 per cent.

The regression equation for difference in phenol content of diseased parts over healthy were  $Y = 30.35 + 1.245x$  for bark,  $Y = 18.01 + 1.226x$  for roots and  $Y = -38.61 + 1.274x$  for wood. The trees belonging to natural hybrid between *Acacia auriculiformis* and *Acacia mangium* were free from the disease which was attributed to more quantity of O.D phenol.

## AGRICULTURAL ENGINEERING

### Investigations on Utilization of Selected Agricultural and Forest Wastes for Gasification

NAGENDRA KAWALE

2001

MAJOR ADVISOR: Er. S.R. DESAI

The experiments were conducted to evaluate the properties of four selected biomass materials namely; cotton stalks, groundnut shells, sunflower stalks and babul wood. The size reduction machine was evaluated for its performance using cotton stalks, sunflower stalks and babul wood at three different levels of moisture content and three different lengths of cut. The downdraft gasifier was tested using the above feed stalks to evaluate the performance of feed stocks for gasification. The performance of 5 hp Victor diesel engine was tested and evaluated by coupling to a downdraft gasifier.

The results indicated that the calorific value was maximum (4503.17 kcal kg<sup>-1</sup>) for babul wood and minimum (3192.17 kcal kg<sup>-1</sup>) for sunflower stalks. The machine cutting capacity for babul wood was maximum (32.96 kg hr<sup>-1</sup>) at 12.50 per cent moisture content for 50 mm length of cut

while it was minimum of 30 kg hr<sup>-1</sup> for sunflower stalks at 15 per cent moisture content 50 mm length of cut. In case of manual method the cutting capacity was maximum (4.95 kg hr<sup>-1</sup>) for babul wood and minimum (4.15 kg hr<sup>-1</sup>) for sunflower stalks. The maximum diesel consumption of 0.943 kg-hr<sup>-1</sup> (at 80 per cent of rated load) was observed in diesel mode while minimum of 0.37 kg-hr<sup>-1</sup> in dual fuel mode among the feed stalks (at 60 per cent of rated load). The biomass consumption in sunflower stalks was maximum (3.25 kg-hr<sup>-1</sup>) while it was minimum (2.0 kg-hr<sup>-1</sup>) for babul wood at 50 per cent diesel substitution. The minimum operating cost of Rs. 11.27, 10.77, 10.97, 11.18, and 11.05 per hp-hr<sup>-1</sup> was noticed for 100 per cent diesel and 50 per cent diesel plus 50 per cent producer gas of cotton stalks, groundnut shells, sunflower stalks and babul wood respectively.

## Abstract of Theses

### FOODS AND NUTRITION

#### **Influence of Process Variables and Flour Characteristics of Sorghum Genotypes on Rheological Properties of Dough and Roti**

M. MADHAVI REDDY

2001

MAJOR ADVISOR: Dr. NIRMALA B. YENAGI

The present investigation was undertaken to standardize the traditional method of *roti* preparation for process variables like dry flour addition to gelatinized mass to prepare dough, baking temperature, Storage of dough and gelatinized mass, dough prepared by cold water, particle size of flour and were evaluated for dough, *roti* making, baking and *roti* quality by physical, chemical, rheological and organoleptic tests. Grain, dough and *roti* qualities of genotypes grown in *kharif* and *rabi* seasons, harvested at different maturity stages and quality of flour and *roti* stored in different packaging materials were also studied. The three important stages of *roti* making process viz., dough preparation, *roti* making and baking were influenced for difference process variables. The optimum conditions for preparing ideal quality *roti* with dough of better handling, *roti* making and baking qualities are use of four of medium particles size (+80 mesh), dough preparation

with 1:1.5 proportion of gelatinized mass and dry flour, baking temperature of 120 °C, storage time of dough for *roti* preparation not more than 30 min. and storage time of gelatinized mass up to 6 hrs. Sorghum cultivars grown in *rabi* season possess better physico-chemical and rheological qualities for end use of *roti* than *kharif* cultivars. Similarly varieties are superior over hybrids. Though sorghum cultivar harvested at physiological maturity stage has better functional qualities for *roti* making than cultivar harvested 10 days before maturity stage. Sorghum flour stored in aluminum box had shelf life of 15 days with an excellent dough and organoleptic qualities. Sorghum flour shelf life can be extended (21 days) without affecting the functional quality of dough with better organoleptic properties by the use of laminated pouch. Cane basket is the most suitable material for storage of *roti* and its shelf life is about two months with good organoleptic, functional and microbial qualities.

#### **Socio-Cultural Factors Influencing the Diet During Pregnancy**

SHAKUNATALA K. DOMBAR

2000

MAJOR ADVISOR: Dr. G. S. SHARADA

The study was conducted in an urban area of Dharwad and Hubli by selecting 300 mothers by purposive sampling technique, which included five communities viz., Kannadiga, Rajasthani, Gujarathi, Punjabi and Tamilian and five religions, viz., Hindu, Muslim, Christian, Jain and Sikh. The data was collected by personal interview method. A majority of the respondents were in their reproductive age. During entire period of pregnancy a maximum number of mothers irrespective of the communities, religious group and social classification had consumed the same amount of foods during pregnancy was found to be more in highly educated, high income group and joint family respondents. Intake of milk with 'ghee' as a special food during pregnancy

was observed only in case of Punjabis and Sikhs. Several food beliefs and taboos were prevalent among all the communities and religions and were mostly centered around the concept of 'hot' and 'abortif' foods. In general, food beliefs and taboos were influenced by culture. Comparatively more number of mothers from less educational status, low income group and joint family avoided various kinds of foods than their counterparts. A higher number of respondents irrespective of social and cultural class difference believed that consumption of more food during pregnancy would affect their own health. A majority of subjects had received guidance by mothers-in-law and mothers.

#### **Documentation and Nutrient Computation of Traditional Festival Foods of Different Communities of Rural and Urban Dharwad**

VIJAYALAXMI R. INAMDAR

2000

MAJOR ADVISOR: Dr. BHARATI V. CHIMMAD

Traditional foods are based on solid foundation of culture, custom, natural environment and are eaten by people of a long time. This investigation was conducted to identify and document the traditional Hindu festival foods of Dharwad, to establish the association of caste, family size, income and generation with festival food and to compute their nutritive value.

In the first phase prevailing traditional festival foods of different communities were identified through cross sectional and longitudinal studies using a pretested questionnaire. Hundred families each from five urban and rural area were selected by purposive random sampling technique. In-depth longitudinal survey of 10 per cent families was conducted throughout calendar year. The

investigation revealed that more number of rural respondents were illiterate and living with three generations. Majority of the urban families were nuclear. The major festival celebrated in both rural & urban Dharwad were *Sankranti*, *Ugadi*, *Nagara panchami*, *Ganeshchaturthi*, *Dasara* and *Deepavali* during which several festival food were prepared. Significant association of caste, family size, income and number of generations living together existed with number of festival foods prepared during the major festivals. Variation in nutrient composition of both sweet and savoury main festival foods was evident.

The calorific value ranged between 195 to 473 and 85 to 334 k cal per cent in sweet and savoury foods, respectively. Protein content varied between 2.3 to 10.0g and 2.25 to 11.07 in sweet and savoury foods, respectively. Among the accompaniments it was found that groundnut laddu and chutney were the nutrient dense foods with high calorific value (630 and 552k cal per cent respectively), protein (20.50 and 23.90% respectively) and fat (23.70 and 39.20%). Some typical traditional festival foods such as *Hurakki holige* and *Kuchagadabu* contributed maximum energy and protein requirements for different age groups.

## HUMAN DEVELOPMENT

### Reproductive Health of Women Belonging to Rural Landless Families

RENUKA N ASUNDI

2001

MAJOR ADVISOR: Dr. K. SAROJA

The present study was conducted in Mundargi Taluk of Gadag district during 1999-2000. 150 married women living with their husband and belonging to landless family were selected by stratified random sampling method. Interview schedule case study and personal observations were the methods used for data collection. Results revealed that majority (85%) were illiterates, agricultural labourers (80.6%) and hailed from poor families. Hindus were high (90.6%) and of those majority (48.0%) were SC/ST's. 63% had more than 3 children. Child wastage in the form of abortions, still births and neonatal deaths was found in 48% among these. 70% of child wastage occurred when they were below 18 years. Half of the women were unprotected by family planning. Because of method related problems, all the temporary method users discontinued them.

Want more children was the common reason (45%) for not getting sterilised. Among those who were sterilised 73% had health problems. Severe backache was the common problem (64%). Inaccessibility of the health centre was the main reason for non utilisation of PHC services. As the ANM was rare in most villages, only 3% of the women received visit and took IFA tablets and 30% were completely immunised. Home deliveries (94%) attended by untrained dais (71%) were more common. Menstrual problem was seen in 30% of the women. Backache (24%) and abdominal pain (22%) were major problems for which treatment was sought from the herbal practitioners only for abdominal pain. 63% of the women had problem during perinatal and postnatal period. The results imply high prevalence of Reproductive health problems and lack of health facilities for the treatment. As such the study highlights the need for improving the health facility in quality and quantity.

## VETERINARY SCIENCES

### Clinical Efficacy of Human Chorionic Gonadotrophin in Repeat Breeding Bovines

K. RAVIKUMAR

2000

MAJOR ADVISOR: Dr. V. K. SUNDARAVADANAN

Twenty four cross bred repeat breeder cows were randomly allocated into four groups of six each. The groups I and II were injected with 1500 U. of hCG (Chorulon (R)) intramuscularly on day (0) of estrus prior to breeding. Group II received a second injection of same dose on day 5 after breeding. Group III was injected 1500 I.U. of hCG only on day 5 after breeding. Group IV served as control and were administered with placebo injection of normal saline on day '0' and 5 of the estrous cycle. All the animals were bred twice at 12 and 24 hours of estrus.

Among the two biochemical parameters studied the serum cholesterol levels on the day of estrus irrespective of the groups were significantly lower in relation to the levels on day 5 and 14 of the estrous cycle. The serum cholesterol levels on the day of estrus did not register any significant difference among the four groups. The mean cholesterol levels in all the four groups ranged between  $114.69 \pm 0.36$  to  $128.32 \pm 0.99$  mg percent. The serum albumin levels on day of estrus irrespective of the groups were significantly lower in relation to the levels on



### **Abstract of Theses**

day 5 and 14 of the estrous cycle. The levels of the serum albumin on day 5 and 14 were similar in groups I, II and IV, while in group III, the day 14 level was significantly higher in relation to days '0' and 5. The mean serum albumin levels in all the four groups ranged between  $2.82 \pm 0.02$  to  $3.50 \pm 0.07$  gm percent.

The first service conception rate was 66.66.83.33.50.00 and 33.33 percent, respectively in the animals of groups I, II, III and IV. The cost of the therapy per animal for groups I, II and III was Rs. 150.00, Rs. 300.00 and Rs. 150.00, respectively.

### **Pathology of Reproductive Organs in Buffaloes of North Karnataka Region**

SUJATA

2000

MAJOR ADVISOR: Dr. D. GOPALAKRISHNARAO

Pathology of reproductive organs of buffaloes from North Karnataka region has been studied by screening two hundred female genital organs of buffaloes that were collected from different slaughter houses of North Karnataka region. The various pathological conditions and the incidence were ovarian abnormalities (10.00%) pathological condition of fallopian tubes (11.50%) and pathological conditions of uterus (13.50%) 77 buffaloes showed various abnormalities of genitalia constituting an overall incidence of 38.50%.

Among the ovarian abnormalities, the incidence of various disorders were as follows: hypoplasia of ovaries (1.50%) cystic corpus luteum (1.00%) embedded corpus luteum (4.00%), dermoid cyst (1.00%) and atretic follicles (2.50%). Among the abnormalities of fallopian tubes hydrosalpinx multilocularis (3.50%) and pyosalpinx (11.50%) were encountered.

Among the uterine abnormalities endometritis

constituted as (2.50%), hydrometra (1%), mucometra (2.50%) and pyometra (7.50%). Adenomyosis interna of uterus with presence of endometrial glands in the tunica musculature of the uterus was frequently encountered chronic suppurative endometritis showed gross pus in the cavity but histological examination revealed absence of clearance of neutrophils from the uterine layers

Similar was the feature with phosalpinx, where in rapid clearance of neutrophils from mucosa of salpinx were observed. Histological features revealed destroyed architecture of fallopian tube loss of primary, secondary and tertiary folds in addition to fibrous tissue with complete fusion of folds. The salpinx and the whole fallopian tube was looking like a glandular structure. From the above result, it could be concluded that pyosalpinx and endometritis is one of the most important genital diseases in this area and might be a cause for infertility, sterility and repeat breeding of dairy animals.

----