

1. Effect of Enriched FYM and Fertilizer Levels on Growth and Yield of Aerobic Rice (*Oryza Sativa* L.)

ASHWINI, M.

ABSTRACT

A field experiment was conducted during 2013 at Agronomy field unit, ZAHRS, University of Agricultural and Horticultural Sciences, Navile, Shimoga. The experiment was laid out in factorial randomized complete block design with three fertilizer level viz., 125:62.5:62.5 NPK.kg ha<sup>-1</sup>, 100:50:50 NPK kg ha<sup>-1</sup> and 75:37.5:37.5 NPK kg ha<sup>-1</sup> with four methods of application viz., separate application of manure and fertilizer, spot application of manure and fertilizer, broadcasting of enriched manure and spot application of enriched manure. Application of 125:62.5:62.5 NPK kg ha<sup>-1</sup> recorded higher plant height (66.07 cm), leaf area (1737.4 cm<sup>2</sup> plant<sup>-1</sup>), number of tillers plant<sup>-1</sup> (37.94), total dry matter accumulation (103.27 g plant<sup>-1</sup>), water use efficiency (46.33 kg ha<sup>-1</sup>cnr<sup>-1</sup>), grain yield (53.54 q ha<sup>-1</sup>) and filled grain (111.86 panicle<sup>-1</sup>) but less unfilled grains (12.83 panicle<sup>-1</sup>) recorded in application 75:37.5:37.5 NPK kg ha<sup>-1</sup> which was on par with level 100:50:50 NPK kg ha<sup>-1</sup> (12.26 panicle<sup>-1</sup>). Significantly higher 1000 grain weight (23.37 g) recorded in application of 100:50:50 NPK kg ha<sup>-1</sup> which was on par with level 75:37.5:37.5 NPK kg ha<sup>-1</sup> (22.78 g).

Among the methods of application spot application of enriched manure recorded significantly higher plant height (66.12 cm), total dry matter accumulation (97.10 g plant<sup>-1</sup>), number of tillers (37.06 panicle<sup>-1</sup>), 1000 grain weight (24.24 g) and grain yield (54.03 q ha<sup>-1</sup>) due to timely available of nutrients. Interaction of spot application of enriched manure with 125:62.5:62.5 NPK kg ha<sup>-1</sup> has registered higher grain yield (60.58 q ha<sup>-1</sup>) and filled grains panicle<sup>-1</sup> (128.75 panicle<sup>-1</sup>). Significantly higher 1000 grain weight (25.80 g) in spot application of enriched manure with 100:50:50 NPK kg ha<sup>-1</sup>. Higher gross returns (Rs. 90,870 ha<sup>-1</sup>), net returns (Rs. 65, 319.74 ha<sup>-1</sup>) and B: C ratio (1: 2.56) was observed in spot application of enriched manure with fertilizer level 125:62.5:62.5 NPK kg ha<sup>-1</sup>.

June, 2014

(C J Sridhara)  
Major Advisor

## 2. Comparative Evaluation of Pre and Post Emergent Herbicides for Control of Weeds in Maize (*Zea Mays L.*)

UMESHA C

### ABSTRACT

An experiment entitled "Comparative evaluation of pre and post emergent herbicides for control of weeds in maize (*Zea Mays L.*) was conducted during *kharif*, 2013 at College of Agriculture, UAHS, Shimoga. Ten treatments [Tembotrione 42 SC at 100 g a. i. ha<sup>-1</sup>, Tembotrione 42 SC at 110 g a. i. ha<sup>-1</sup>, Atrazine 50 WP at 1000 g a. i. ha<sup>-1</sup>, 2, 4-D Na salt 80% WP at 1000 g a. i. ha<sup>-1</sup>, Tembotrione 42 SC at 100 g a. i. ha<sup>-1</sup> + atrazine 50 WP at 1000 g a. i. ha<sup>-1</sup>, Atrazine 50 WP at 1000 g + 2, 4-D Na salt 80% WP at 1000 g a. i. ha<sup>-1</sup>, Atrazine 50 WP at 1000 g a. i. ha<sup>-1</sup> + inter-cultivation, Weedy check and Weed free check] were replicated thrice in RCBD.

Major weeds observed were *Cyperus rotundus*, *Cyperus sesculantus* (sedges), *Cynodon dactylon*, *Elusina indica* (grasses) and *Commelina benghalensis*, Cleome if is cosa, *Celosia argentia* and *Acanthospermum hispidum* broad leaved weeds. Significantly higher grain yield, water use efficiency and nitrogen use efficiency, phosphorus use efficiency and potassium use efficiency were recorded in application of Tembotrione 42 SC at 100 g a.i. ha<sup>-1</sup> + Atrazine 50 WP at 1000 g a.i. ha<sup>-1</sup> (58.81 q ha<sup>-1</sup> 9.16 and 39.20, 178.28, 176.44, respectively), Atrazine 50 WP at 1000 g a.i. ha<sup>-1</sup> (58.47 q ha<sup>-1</sup> and 38.98, 177.17, 175.42, respectively), Atrazine 50 WP at 1000 g + 2, 4-D Na salt 80 % WP at 1000 g a.i. ha<sup>-1</sup> (58.03 q ha<sup>-1</sup>, 9.04 and 38.69, 175.80, 174.12, respectively) and Atrazine 50 WP at 1000 g a.i. ha<sup>-1</sup> + Tembotrione 42 SC at 100 g a.i. ha<sup>-1</sup> (57.67 q ha<sup>-1</sup>, 8.98 and 38.45, 174.77, 173.04, respectively) and without any residual effect on succeeding Green grain Crop.

June, 2014

(S Sridhar)  
Major Advisor

### 3. Growth Analysis, Yield and Quality of Guar Genotypes as Influenced by Planting Density

**NANDINI, K.M.**

#### **ABSTRACT**

A field experiment was conducted at University of Agricultural and Horticultural Sciences, Navile, Shivamogga during *kharif2014* on red sandy clay soil to study the growth analysis, yield and quality of guar genotypes as influenced by planting density. The experiment was laid out in factorial randomized complete block design with three replications. There were twelve treatment combinations comprised of four spacing (45cmx15cm, 30cmx15cm, 45cmx10cm and 30cmx10cm) and three genotypes (RGC-I003, RGC-936 and HG-365). Among the spacing, significantly higher grain yield (743.89 kg ha<sup>-1</sup>), stover yield (1629.94 kg ha<sup>-1</sup>), RUE (1.32 Mj m<sup>-2</sup>), HUE (1.53 x 10<sup>-2</sup>), PTUE (2.29 x 10<sup>-2</sup>) and quality parameters like gum per cent (30.36), protein percent (30.94) and endosperm percent (33.49), viscosity (236.47 cps I) were recorded in plants grown at 30cmx10cm.

Among the genotypes, significantly higher total dry matter (23.38 g plant<sup>-1</sup>), grain yield (898.18 kg ha<sup>-1</sup>), stover yield (1931.39 kg ha<sup>-1</sup>), RUE (1.26 Mj m<sup>-2</sup>), HUE (1.60 x 10<sup>-2</sup>), PTUE (2.39 x 10<sup>-2</sup>) and quality parameters like gum per cent (31.09), protein per cent (31.68) and endosperm per cent (33.96) viscosity RGC-I003 (245.75 CpS-I) were recorded with the RGC-I003. This could be due to genetic potentiality of the genotypes. The interaction of spacing and genotypes were found to be statistically non significant. The functional growth models like Logistic, Gompertz and Richards shows the pattern of dry matter accumulation of guar genotypes at different spacing.

May, 2015

(C J Sridhara)  
Major Advisor

#### 4. Studies on Performance of Traditional Paddy (*Oryza Sativa L.*) Varieties Under Different Nutrient Management Practices

**GAGANDEEP, H.N.**

##### **ABSTRACT**

A field experiment was conducted during 2014 at AHRS, Honnavile, UAHS, Shivamogga. The experiment was laid out in a Randomized Complete Block Design (Factorial concept) with four varieties and four different nutrient management practices with three replications. The cultivars used were Chinnaponni, Mysore mallige, Coimbatore sanna and JGL – 1798 and different nutrient sources were Rec. FYM + 100 % Rec. N equivalent through organics, 100 % Rec. NPK through inorganics (100:50:50 NPK kg ha<sup>-1</sup>), Rec. FYM + 50 % N equivalent through organics + 50 % NPK through inorganics (100:50:50 NPK kg ha<sup>-1</sup>) and Rec. FYM + 100 % Rec. NPK through inorganics.

The results revealed that among the traditional paddy varieties Chinnaponni recorded higher plant height (76.1 cm), leaf area (914.0 cm<sup>2</sup> hill<sup>-1</sup>), number of effective tillers (26.4 hill<sup>-1</sup>), total dry matter accumulation (82.92 g hill<sup>-1</sup>), grain yield (3610 kg ha<sup>-1</sup>) and 1000- grain weight (22.2 g) compared to all traditional varieties. The high yielding paddy variety JGL-1798 recorded significantly higher plant height (81.6 cm), leaf area (919.9 cm<sup>2</sup> hill<sup>-1</sup>), number of effective tillers (29.0 hill<sup>-1</sup>) and total dry matter accumulation (91.48 g hill<sup>-1</sup>), grain yield (4997 kg ha<sup>-1</sup>) and 1000- grain weight (24.1 g) compared to all traditional varieties.

Among the different nutrient management practices Rec. FYM + 100 % Rec. N equivalent through organics recorded significantly taller plants (74.8 cm), leaf area (942.4 cm<sup>2</sup> hill<sup>-1</sup>), number of effective tillers (26.3 hill<sup>-1</sup>) and total dry matter accumulation (83.05 g hill<sup>-1</sup>), grain yield (3580 kg ha<sup>-1</sup>) and 1000- grain weight (22.2 g). However, it was on par with application of Rec. FYM + 100 % Rec. NPK through inorganics and Rec. FYM + 50 % N equivalent through organics + 50 % NPK through inorganics as compared to application of 100 % NPK through inorganics.

July, 2015

(C. Sunil)  
Major Advisor

## 5. Effect of Zinc Application through Soil and Foliar Means on Biofortification of Zinc in Maize (*Zea Mays* L.)

**SHIVANAND PATIL**

### **ABSTRACT**

A field experiment entitled 'Effect of zinc application through soil and foliar means on biofortification of zinc in maize (*Zea mays* L.)' was conducted at Agriculture College, Navile, UAHS, Shivamogga during *kharif* 2014. The experiment consisted of 12 treatments with three replication was laid out in randomized complete block design (RCBD). The treatments comprise of zinc fertilization through zinc enriched maize residue compost, FYM, soil and foliar means were compared with recommended dose of fertilizer alone and recommend package of practice.

Maize residue compost applied @ 7.5 t ha<sup>-1</sup> enriched with 15 kg ZnSO<sub>4</sub> recorded significantly higher grain (60.9 q ha<sup>-1</sup>) and stover yields (62.57 q ha<sup>-1</sup>). The superiority of former treatment was traced back to the significant improvement in growth attributes *viz.*, plant height (172.63 cm), leaf area (45.57 dm<sup>2</sup>), leaf area index (3.38), leaf area duration (113.84 days), total dry matter production (326.38 g plant<sup>-1</sup>) and crop growth rate (44.61 g m<sup>-2</sup> day<sup>-1</sup>) and yield attributes such as cob diameter (5.05 cm), test weight (31.51 g) and grain yield per plant (137.4 g). The significant improvement in growth and yield parameters with maize residue compost applied @ 7.5 t ha<sup>-1</sup> enriched with 15 kg ZnSO<sub>4</sub> was due to higher total nutrient uptake (124.11, 24.87, 149.36 kg N, P<sub>2</sub>O<sub>5</sub>, K<sub>2</sub>O and 451.51 g zinc ha<sup>-1</sup>, respectively) by the crop.

The quality parameters of maize *viz.*, grain zinc content (46.67 mg kg<sup>-1</sup>), soluble protein (5.39 mg g<sup>-1</sup>), crude protein in grain (12.67 %) and protein yield (760.14 kg ha<sup>-1</sup>) were also higher with application ZnSO<sub>4</sub> @ 15 kg ha<sup>-1</sup> through enriched MRC (@ 7.5 t ha<sup>-1</sup>).

July, 2015

(G. K. Girijesh)  
Major Advisor

## 6. Effect of Integrated Nutrient Management on Growth and Yield of Aerobic Rice (*Oryza Sativa* L.)

**KIRAN KUMAR**

### **ABSTRACT**

A field experiment was conducted during *Kharif* 2014 at agriculture and Horticulture Research Station (AHRS), Bavikere to know the combined effect of organic and inorganic fertilizers on growth and yield of aerobic rice. The experiment was laid out in a randomized complete block design (RCBD) with eleven treatments replicated thrice.

Application of RDF + Vermicompost + PSB + 25% Nitrogen through glyricidia recorded higher plant height (65.10 cm), number of leaves (103.32 plant<sup>-1</sup>), leaf area (2323.60 cm<sup>2</sup> plant<sup>-1</sup>), leaf area index (3.72), number of tillers (31.63 plant<sup>-1</sup>), total dry matter accumulation (96.46 g plant<sup>-1</sup>), grain yield (4241 kg ha<sup>-1</sup>) and straw yield (5487 kg ha<sup>-1</sup>) which was on par with the application of RDF + FYM + PSB + 25% Nitrogen through glyricidia grain yield (4111 kg ha<sup>-1</sup>) straw yield of (5248 kg ha<sup>-1</sup>), respectively.

Application of RDF + Vermicompost + PSB + 25% Nitrogen through Glyricidia resulted in higher total nitrogen, phosphorus and potassium uptake by aerobic rice (131.32, 26.95 and 113.07 kg ha<sup>-1</sup>, respectively) which was on par with the application of RDF + FYM + PSB + 25% Nitrogen through glyricidia (125.54, 25.28 and 111.97 kg ha<sup>-1</sup>, respectively). Lower uptake of nitrogen, phosphorus and potassium (86.93, 13.26 and 85.46 kg ha<sup>-1</sup>, respectively) was observed with application recommended dose of fertilizer (RDF) alone.

The available nitrogen, phosphorus and potassium (272.62, 86.95 and 221.30 kg ha<sup>-1</sup>, respectively) after the crop harvest were observed with the application of RDF + Vermicompost + PSB + 25% Nitrogen through glyricidia which was on par with application of RDF + FYM + PSB + 25% Nitrogen through glyricidia (271.30, 85.69, and 201.25 kg ha<sup>-1</sup>, respectively). Lower available nitrogen, phosphorus and potassium (265.14, 76.81 and 164.82 kg ha<sup>-1</sup>, respectively) were observed with application of recommended dose of fertilizer (RDF) alone.

July, 2015

(C. J. Sridhara)  
Major Advisor

## 7. Integrated Use of Conventional and Foliar Fertilizers with Effective Microbial Consortia on Productivity of Paddy (*Oryza Sativa* L.) in Southern Transition Zone (STZ) of Karnataka

**VISHWANATH PATIL**

### **ABSTRACT**

A field experiment was conducted during Kharif season of 2014 at Agronomy field unit, University of Agricultural and Horticultural Sciences, Navile, Shivamogga. The experiment was laid out in Randomized Complete Block Design with thirteen treatments replicated thrice. Treatments consisted of two levels of recommended dose of fertilizers (75 and 100%) supplemented with foliar fertilizers application *viz.*, 19:19:19 and 13:0:45 at different stages and bioinoculation of effective microbial consortia. The paddy variety used was JGL-1798. The results revealed that among the different treatments, application of 100 per cent recommended dose of NPK with one per cent each foliar spray of 19:19:19 and 13:0:45 at maximum tillering and grain filling stages, respectively with bioinoculation of effective microbial consortia (*Azospirillum* + *Bacillus megaterium* + *Fratureuria aurantia*) recorded significantly higher plant height (98.13 cm), number of leaves (65.36), number of tillers (18.10), leaf area (1097.83 cm<sup>2</sup>) and total dry matter production hill<sup>-1</sup> (61.28 g).

Yield contributing characters like number of productive tillers hill<sup>-1</sup> (16.10), panicle length (23.30 cm), panicle weight (3.58 g), 1000 grain weight (23.10 g) and number of filled grains panicle<sup>-1</sup> (151.33) were also significantly higher in the above said treatment with least chaffiness (4.99 %) which ultimately resulted in significantly higher grain (75.56q ha<sup>-1</sup>) and straw yield of paddy (78.05 q ha<sup>-1</sup>). The quantum of yield increase was 21.62 per cent as compared to recommended dose of NPK (62.13 q ha<sup>-1</sup>). Nutrient uptake by the crop also registered similar trend as that of growth and yield parameters with statistically higher uptake of N (85.82 kg ha<sup>-1</sup>), P<sub>2</sub>O<sub>5</sub> (30.51 kg ha<sup>-1</sup>) and K<sub>2</sub>O (50.58 kg ha<sup>-1</sup>). In terms of economics also, numerically higher gross returns (Rs. 110181.33 ha<sup>-1</sup>), net returns (Rs. 79410.08 ha<sup>-1</sup>) and B:C ratio of 2.58 is noticed in the same treatment.

July, 2015

(H. K. Veeranna)  
Major Advisor

## 8. Effect of Liquid Fertilizers on Rainfed Hybrid Maize (*Zea mays* L.) in Southern Transition Zone of Karnataka

**CHAITHANYA**

### **ABSTRACT**

A field experiment entitled Effect of liquid fertilizers on rainfed hybrid maize (*Zea mays* L.) in Southern Transition Zone of Karnataka was conducted during *Kharif* 2014 at Agricultural and Horticultural Research Station, Bavikere, UAHS, Shivamogga. On red clay loam soil which was low in available nitrogen, medium in available phosphorus and potassium. There were 11 treatment combination consisting of two water soluble fertilizers along with Package of practice *i.e.* (only RDF, 0.5 % 18:18:18, 1.0 % 18:18:18, 1.5 % 18:18:18, 0.5 % Multi-K, 1.0 % Multi-K, 1.5 % Multi-K, 1.0 % 18:18:18 + 0.5 % Multi-K, 1.0 % 18:18:18 + 1.0 % Multi-K and 1.0 % 18:18:18 + 1.5 % Multi-K) and two stages of foliar application of Water Soluble Fertilizers at 30 DAS and 60 DAS. The experiment was laid out in RCBD with replicated thrice.

The results revealed that Package of Practice + 18:18:18 @ 1.0 % + Multi-K @ 1.5 % recorded significantly higher plant height (218.7 cm), leaf area (62.8 cm<sup>2</sup> plant<sup>-1</sup>), total dry weight (335 g plant<sup>-1</sup>), cob length (18.5 cm), thousand grain weight (236 g), shelling percentage (82.9 %), number of grain per cob (435), grain rows per cob (12.9), grain weight per plant (179 g), Grain yield (83.99 q ha<sup>-1</sup>), stover yield (183.38 t ha<sup>-1</sup>) and harvest index (0.46) compared to other of treatments. Similarly, available nutrients (286.2, 30.4 and 191.8 N, P<sub>2</sub>O<sub>5</sub> and K<sub>2</sub>O kg ha<sup>-1</sup>, respectively) nutrient uptake (240.2, 299.4 and 307.8 kg ha<sup>-1</sup> NPK, respectively), apparent crop recovery efficiency (12.32, 13.18 and 99.99 % NPK, respectively) and agronomic use efficiency (9.78, 18.64 and 18.69 % NPK, respectively) were higher besides higher gross return (Rs. 1,09,957.0 ha<sup>-1</sup>). However, due to higher unit cost of WSF and higher ICBR (23.86) over control was recorded in POP +18:18:18 @ 1.0 % + Multi-K @ 0.5 %. It is also concluded that Package of Practice + 18:18:18 @ 1.0 % + Multi-K @ 1.5 % foliar application at 30 DAS and 45DAS found higher yield and returns.

July, 2015

(Narayana S. Mavarkar)  
Major Advisor

## 9. Nutrient Management for Target Yield Concept in Rice under Transplanted Condition in Southern Transition Zone

**HARI HARA MURTHY, N.**

### **ABSTRACT**

A field experiment was conducted during 2014 at Agricultural and Horticultural Research station, Bhavikere, UAHS, Shivamogga to study the effect of Nutrient management for target yield concept in rice under transplanted condition in southern transition zone. The experiment was laid out in a RCBD. (Factorial concept) with two genotypes and four different nutrient levels with three replications. The genotypes used were KRH-4 and JGL-1798 and different nutrient levels were RDF (100:50:50 kg NPK ha<sup>-1</sup>), fertilizer requirement for target yield of 7.5 t ha<sup>-1</sup>, fertilizer requirement for target yield of 10 t ha<sup>-1</sup>, fertilizer requirement for target yield of 12.5 t ha<sup>-1</sup>.

Among the genotypes, KRH-4 recorded higher plant height (107.13 cm), number of effective tillers (15.08 hill<sup>-1</sup>), total dry matter accumulation (80.28 g hill<sup>-1</sup>), straw yield (104.08 q ha<sup>-1</sup>) and grain yield (82.42 q ha<sup>-1</sup>) compared to JGL-1798. Among the nutrient levels, target yield of 12.5 t ha<sup>-1</sup> recorded significantly higher plant height (110.50 cm), number of effective tillers (17.93 hill<sup>-1</sup>) and total dry matter accumulation (84.50 g hill<sup>-1</sup>), straw yield (118.71) and grain yield (97.13 kg ha<sup>-1</sup>) than other nutrient levels.

Among the interactions, KRH-4 with target yield of 12.5 t ha<sup>-1</sup> recorded significantly higher straw yield (122.0 q ha<sup>-1</sup>) and grain yield (102.90 kg ha<sup>-1</sup>) than other interactions. Similarly higher uptake of nitrogen (117.01 kg ha<sup>-1</sup>), phosphorous (22.81 kg ha<sup>-1</sup>) and potassium (104.50 kg ha<sup>-1</sup>) was recorded in KRH-4. Among the nutrient levels, higher uptake of nitrogen (125.59 kg ha<sup>-1</sup>), phosphorous (30.43 kg ha<sup>-1</sup>) and potassium (116.45 kg ha<sup>-1</sup>) was recorded in target yield of 12.5 t ha<sup>-1</sup> than other nutrient levels. Higher cost of cultivation (Rs.37865 ha<sup>-1</sup>) and net returns (Rs.104756 ha<sup>-1</sup>) was seen in the treatment KRH-4 with target yield of 12.5 t ha<sup>-1</sup>. However higher B: C ratio (2.95) was seen in KRH-4 with target yield of 10 t ha<sup>-1</sup>.

July, 2015.

(Basavaraj Naik, T.)  
Major Advisor

## 10. Effect of Integrated Nutrient Management on Growth and Yield of Rainfed Finger millet (*Eleusine coracana* (L.) Gaertn.)

**THIMMAIAH, M.**

### **ABSTRACT**

A field experiment was conducted during 2014 at field unit of Agronomy department, UAHS, Shivamogga. The experiment was laid out in a Randomized Complete Block Design (RCBD) with twelve treatments having three replications. The treatments comprised of farm yard manure (FYM), frond compost and vermicompost combinations along with PGPR and recommended NPK tested against farmers practice and recommended NPK alone.

Among the different nutrient management practices, Recd. NPK+FYM at 7.5 t ha<sup>-1</sup>+PGPR at 2 kg ha<sup>-1</sup>+Vermicompost and Frond compost both at 3.75 t ha<sup>-1</sup> as top dress at 25 DAT recorded significantly taller plants (145.27 cm), leaf area (1177.30 cm<sup>2</sup> plant<sup>-1</sup>), number of tillers (4.07 plant<sup>-1</sup>), total dry matter accumulation (59.13 g plant<sup>-1</sup>), 1000 grain weight (3.76 g), grain yield (63.50 q ha<sup>-1</sup>) and straw yield (86.67 q ha<sup>-1</sup>). It registered 119 and 87 per cent higher yield respectively over farmers practice and recd.NPK alone. It also recorded higher uptake of NPK in both grain and straw.

The nutrient use and agronomic use efficiency was found highest in Recd. NPK+FYM at 7.5 t ha<sup>-1</sup>+PGPR at 2 kg ha<sup>-1</sup>+Frond compost at 3.75 t ha<sup>-1</sup> as top dress at 25 DAT. The highest available NPK and physiological use efficiency was recorded in Recd. NPK+FYM at 7.5 t ha<sup>-1</sup>+PGPR at 2 kg ha<sup>-1</sup>+Vermicompost at 3.75 t ha<sup>-1</sup> as top dress at 25 DAT. The highest partial factor productivity was recorded in Recd. NPK+FYM at 7.5 t ha<sup>-1</sup>+PGPR at 2 kg ha<sup>-1</sup>. Similarly, higher net returns (Rs. 66,728 ha<sup>-1</sup>) was recorded in recommended NPK + FYM at 7.5 t ha<sup>-1</sup> + PGPR at 2 kg ha<sup>-1</sup> + Frond compost at 3.75 t ha<sup>-1</sup> as top dress at 25 DAT.

July, 2015

(M. Dinesh Kumar)  
Major Advisor

## 11. Nitrogen Management in Rainfed Maize (*Zea mays* L.) through Slow Release Nitrogenous Fertilizers Under Light Textured Soils

**SHILPHA, S. M.**

### **ABSTRACT**

The field experiment entitled “Nitrogen management in rainfed maize through slow release nitrogenous fertilizers under light textured soils” was conducted during *Kharif*, 2015 at Agronomy field unit of College of Agriculture, UAHS, Navile, Shivamogga. The experiment consisting of ten treatments replicated thrice was laid out in Randomized Complete Block Design. The treatment comprises of three types of oil coated urea *viz.*, neem coated urea, pongamia and castor oil coated urea which were applied either in single application at sowing as basal and in split applications as top dress at 30 days after sowing along with application of normal urea without any coating.

Significantly higher grain ( $69.45 \text{ q ha}^{-1}$ ) and stover yield ( $79.42 \text{ q ha}^{-1}$ ) were recorded by the application of 100 percent recommended N through neem coated urea as basal. Superiority of the treatment was due to the significant improvement in growth attributes *viz.*, plant height (207.70 cm), leaf area ( $39.00 \text{ dm}^2 \text{ plant}^{-1}$ ), leaf area index (2.17), leaf area duration (91.92 days), total dry matter production ( $321.70 \text{ g plant}^{-1}$ ), crop growth rate ( $9.55 \text{ g m}^{-2} \text{ day}^{-1}$ ), relative growth rate ( $0.0018 \text{ g g}^{-1} \text{ day}^{-1}$ ) and yield attributes such as cob length (15.7 cm), test weight (42.72 g) and grain weight per plant ( $124.95 \text{ g plant}^{-1}$ ). Significant improvement in growth and yield parameters with application of different slow release nitrogenous fertilizers was mainly due to higher availability of nutrients in soil (239.36, 74.9 and 272.4 kg N,  $\text{P}_2\text{O}_5$  and  $\text{K}_2\text{O ha}^{-1}$ , respectively) which may be attributed for higher total nutrient uptake (128.54, 38.36 and 110.95 kg N,  $\text{P}_2\text{O}_5$  and  $\text{K}_2\text{O ha}^{-1}$ , respectively) by the crop.

June, 2016

(T. M. Soumya)  
Major Advisor

## 12. Weed Management in Rice Through Application of Pre and Post Emergent Herbicides in Coastal Zone of Karnataka

**ATHAULLA, P.**

### **ABSTRACT**

A field experiment entitled “Weed management in rice through application of pre and post emergent herbicides in coastal zone of Karnataka” was conducted during *kharif* 2015 at Zonal Agricultural and Horticultural Research Station, Bramhavara to evaluate suitable pre and post emergent herbicides for rice. The herbicides tested were two pre emergent *viz.* Bensulfuron methyl 0.6% G + Pretilachlor 6% G, Pyrazosulfuran ethyl 10 WP, three post emergent herbicides *viz.* Bispyribac sodium 10 SC, Penoxsulum 240 SC, Ethoxysulfuron 15 WG. Post emergent herbicides were preceded by the application of pre emergent herbicide Pyrazosulfuran ethyl 10 WP. In addition hand weeding twice at 20 and 40 DAP and weedy check was also included for comparison. The experiment was laid in RCBD design with three replication.

The results revealed that sequential application of Pyrazosulfuran ethyl 10 WP @ 25 g a.i. ha<sup>-1</sup> at 3 DAP followed by Penoxsulum 240 SC @ 22.5 g a.i.ha<sup>-1</sup> at 20 DAP recorded significantly lower weed count, weed dry weight, weed index (8.11 %) and higher weed control efficiency ( 94.09 to 78.55 % ) without being phytotoxic to the crop. The same treatment combination recorded significantly higher growth and growth attributes *viz.* Plant height, number of tillers, number of leaves, leaf area, LAI, AGR and CGR. Significantly higher grain yield (5351 kg ha<sup>-1</sup>), straw yield (6208 kg ha<sup>-1</sup>) and major nutrients uptake by crop was also recorded in the above mentioned treatment. These results are on par with hand weeding twice at 20 and 40 DAP. The unweeded check recorded significantly lower growth and its attributes and also recorded higher major nutrients removal by weeds. The maximum net returns (Rs. 34,378 ha<sup>-1</sup>) and profit per rupee invest (1:1.58) was achieved in sequential application of Pyrazosulfuran ethyl 10 WP @ 25 g a.i. ha<sup>-1</sup> at 3 DAP followed by Penoxsulum 240 SC @ 22.5g a.i.ha<sup>-1</sup> at 20 DAP.

June, 2016

(K.V. Sudhir Kamath)  
Major Advisor

### 13. Crop Weather Relationships in Maize as Influenced by Sowing Dates

**DADAPEER, B. H.**

#### **ABSTRACT**

A field experiment was conducted at College of Agriculture, UAHS, Shivamogga during *kharif* 2015 to study the crop weather relationships in maize as influenced by sowing dates. The experiment was laid out in factorial RCBD with three replications. There were eight treatment combinations comprised of four dates of sowing (June 15<sup>th</sup>, June 30<sup>th</sup>, July 15<sup>th</sup> and July 30<sup>th</sup>) and two hybrids (PAC - 740 and CP - 818).

Among the dates of sowing June 15<sup>th</sup> sown crop recorded significantly higher plant height (201.03 cm), total dry weight (305.65 g plant<sup>-1</sup>), kernel yield (7632.57 kg ha<sup>-1</sup>), stover yield (9512.56 kg ha<sup>-1</sup>), HUE (17.87 x 10<sup>-2</sup> g °C day<sup>-1</sup>), PTUE (14.27 x 10<sup>-3</sup> g °C hrs<sup>-1</sup>), HTUE (35.84 x 10<sup>-3</sup> g °C hrs<sup>-1</sup>) and RUE (3.14 g MJ<sup>-1</sup>) compared to other dates of sowing. Between the hybrids CP - 818 recorded significantly higher plant height (191.85 cm), total dry weight (277.65 g plant<sup>-1</sup>), kernel yield (7060.72 kg ha<sup>-1</sup>), stover yield (8839.98 kg ha<sup>-1</sup>), HUE (16.49 x 10<sup>-2</sup> g °C day<sup>-1</sup>), PTUE (13.35 x 10<sup>-3</sup> g °C hrs<sup>-1</sup>), HTUE (28.77 x 10<sup>-3</sup> g °C hrs<sup>-1</sup>) and RUE (3.00 g MJ<sup>-1</sup>) compared to PAC - 740. Interaction effects were non significant. However, higher kernel yield (7983.00 kg ha<sup>-1</sup>) was recorded with CP – 818 sown on June 15<sup>th</sup>.

Rainfall (r = 0.79\*\*), sunshine hours (r = 0.42\*), maximum temperature (r = 0.46\*), solar radiation (r = 0.83\*\*), relative humidity (r = 0.75\*\*) and evaporation (r = 0.85\*\*) during silking to maturity had positive significant relationship with kernel yield in maize. On the other hand maximum temperature from emergence to knee high stage (r = - 0.63\*\*), knee high stage to tasseling (r = - 0.71\*\*), silking to maturity (r = - 0.46\*) and minimum temperature from emergence to knee high stage (r = - 0.62\*\*), knee high stage to tasseling (r = - 0.52) had negative significant relationship with kernel yield in maize. From the study it can be inferred that CP - 818 is suitable for early sowing and PAC - 740 can be used under delayed sowing for getting higher kernel yield in maize.

September, 2016

(S. Sridhara)  
Major Advisor

## 14. Efficiency of Slow Releasing Nitrogenous Fertilizers on Growth and Yield of Paddy in Coastal Karnataka

**BHANUPRAKASH, H. R.**

### **ABSTRACT**

A field experiment was conducted during the *kharif* 2015 at Zonal Agricultural and Horticultural Research Station Brahmavara, UAHS, Shivamogga to study the efficacy of urea coated with different substances on growth and yield of transplanted paddy. The experiment was laid out in randomized complete block design with nine treatments replicated thrice. The treatments consisted of neem oil coated urea, mud coated urea, pongamia oil coated urea and cashew nut shell liquid coated urea at 100 per cent and 75 per cent recommended dose of nitrogen. Only the basal applications of these fertilizers were coated.

Application of 100 per cent recommended dose of nitrogen through neem oil coated urea produced significantly higher grain and straw yield (5541, 7995 kg ha<sup>-1</sup> respectively), as compared to recommended dose of fertilizer (4209, 6793 kg ha<sup>-1</sup> respectively) in normal form. This was mainly due to growth attributing parameters like plant height (97.09 cm), number of leaves per hill (66.90), number of tillers per hill (19.60), leaf area per hill (1014.96 cm<sup>2</sup>), total dry matter production per hill (62.66 g) and yield contributing characters like number of productive tillers per hill (19.48), panicle length (23.73 cm), panicle weight (3.67 g), 1000 grain weight (23.64 g), number of filled grains per panicle (110.29) and harvest index (0.40).

The total nutrient uptake of nitrogen, phosphorus and potassium (117.71, 35.40 and 126.10 kg ha<sup>-1</sup>, respectively) with higher benefit cost (1.61) and net returns (Rs. 63167.36) were found higher in the same treatment, this is followed by 100 per cent recommended dose of nitrogen through cashew nut shell liquid coated urea has recorded higher grain and straw yield (5226, 7892 kg ha<sup>-1</sup> respectively). Significantly higher agronomic nitrogen use efficiency (22.19 kg grain kg<sup>-1</sup> nitrogen) was recorded in treatment 100 per cent RDN through neem oil coated urea. Further, results from an incubation study showed that the rate of nitrogen release was spontaneous upto 60 days in the treatment 100 per cent RDN through neem oil coated urea.

June, 2016

(M. Hanumanthappa)  
Major Advisor

## 15. Comparative Evaluation of the Pre Emergence Herbicides on Weed Dynamics in Maize (*Zea Mays* L.) and their Residual Effect on Succeeding Crop

**PRADEEP, L. S.**

### **ABSTRACT**

A field experiment entitled “comparative evaluation of the pre -emergence herbicides on weed dynamics in maize (*Zea mays* L.) and their residual effect on succeeding crop” was conducted during *kharif* 2015 at College of Agriculture, University of Agricultural and Horticultural Sciences, Shivamogga. The herbicides included were saflufenacil + dimethenamid-P (Integrity 66.8 EC) @ 501, 668 and 835 g a.i. ha<sup>-1</sup>, sole application of saflufenacil 70 WG @ 51, 68 and 85 g a.i. ha<sup>-1</sup>, sole application of dimethenamid-P 72 EC @ 450, 600 and 750 g a.i. ha<sup>-1</sup> and Atrazine 50 WP @ 1.25 kg a.i. ha<sup>-1</sup>. In addition to package of practices, weed free check and untreated control were also included for comparison. The predominant weed flora observed in the experimental field were, *Cyperus rotundus*, *Cynadon dactylon*, *Eleusine indica*, *Digitaria sanguinalis*, *Digitaria marginata*, *Commelina benghalensis*, *Ageratum conyzoides*, *Celosia argentia*, *Alternanthera sessilis*, *Borreria stricta* and *Acanthospermum hispidum*. Pre - emergence application of saflufenacil was found more effective against broad leaved weeds while, dimethenamid-P against the grass and sedges.

The combi- product of saflufenacil 68 g l<sup>-1</sup> + dimethenamid-P 600 g l<sup>-1</sup> EC (Integrity 66.8 EC) @ 668 g a. i. ha<sup>-1</sup> acting as broad spectrum herbicide was found more efficient in controlling all types of weeds by recording highest weed control efficiency (72.63%) at 60 DAS in maize without having any phytotoxicity on maize as well as succeeding crop of green gram. The same treatment recorded higher nutrient uptake by the crop (74.07, 13.36 and 71.02 kg NPK ha<sup>-1</sup>, respectively, at 60 DAS). Thus, from the study, it can be inferred that pre tank mixture of saflufenacil 68 g l<sup>-1</sup> + dimethenamid-P 600 g l<sup>-1</sup> EC (Integrity 66.8 EC) @ 668 g a. i. ha<sup>-1</sup> can be used as pre - emergence safely in maize for better productivity (7420 kg ha<sup>-1</sup>) and higher B: C ratio (2.91) and effective weed management.

June, 2016

(G. K. Girijesh)  
Major Advisor

## 16. Assessment of Maize and Pole Bean Intercropping System under different Geometry, Sowing Time and Fertilizer Levels in Southern Transition Zone of Karnataka

**AFROZA PATEL**

### **ABSTRACT**

A field experiment was conducted during *Kharif* 2015 at College of Agriculture, Navile, Shivamogga. The experiment was laid out in Randomized Complete Block Design with ten treatments replicated thrice. Treatments consisted of two spacing for maize crops (60 cm x 30 cm and 75/45 cm x 30 cm under paired row) in combination with two dates of sowing for pole bean (simultaneous sowing of both maize and pole bean and pole bean sowing 10 DAS of maize) and two doses of fertilizer for pole bean (100 and 50% of NPK) in intercropping system. Besides, sowing of maize and pole bean at their regular spacing under monocropping system. The maize hybrid used was CP818. The results revealed that, though the maize sole crop at 60 cm x 30 cm spacing recorded significantly higher growth and yield parameters.

Treatment under intercropping of maize + pole bean simultaneous sowing under paired row at 75/45 cm x 30 cm with application of 100 per cent NPK for pole bean gave higher maize equivalent yield ( $174.55 \text{ q ha}^{-1}$ ) with an yield advantage of 110 per cent, LER of 1.53 (53 % more land use efficiency), ATER of 1.39, with less competition ratio of 1.83 and higher monetary advantage of Rs. 71217 over sole cropping of maize. Hence, the above treatment found best over sole maize crop and other intercropping systems. Further, the same treatment earned the higher gross returns (Rs. 209464) and net returns (Rs.130331) with B:C ratio of 2.65 besides, maintaining the soil fertility with available nutrients of nitrogen ( $238.33 \text{ kg ha}^{-1}$ ), phosphorus ( $223.04 \text{ kg ha}^{-1}$ ) and potassium ( $327.29 \text{ kg ha}^{-1}$ ).

July, 2016

(H. K. Veeranna)  
Major Advisor

## 17. Effect of Water Soluble Fertilizers and Molybdenum on Rainfed Groundnut (*Arachis hypogaea* L.) under Southern Transition Zone of Karnataka

GOWDESH, K. T

### ABSTRACT

A field experiment entitled Effect of water soluble fertilizers and molybdenum on rainfed groundnut (*Arachishypogaea* L.) under Southern Transition Zone of Karnataka was conducted during *kharif* season of 2015 at the college of Agriculture, Navile, Shivamogga, on red clay loam soil land which was low in nitrogen, medium in available phosphorous, low in available potassium. There were fourteen treatments comprising T<sub>1</sub>: RDNPK alone (25 kg N 50 kg P<sub>2</sub>O<sub>5</sub> and 25 kg K<sub>2</sub>O ha<sup>-1</sup>), T<sub>2</sub>: RNMP + Seed treatment with ammonium molybdate @ 6 g kg<sup>-1</sup> seed, T<sub>3</sub>: RNMP + Foliar application of NPK (18:18:18) @ 1 % at 30 and 45 DAS, T<sub>4</sub>: T<sub>3</sub> + Seed treatment with ammonium molybdate @ 6 g kg<sup>-1</sup> seed, T<sub>5</sub>: RNMP + Foliar application of Multi-K @ 1 % at 30 and 45 DAS, T<sub>6</sub>: T<sub>5</sub> + Seed treatment with ammonium molybdate @ 6 g kg<sup>-1</sup> seed, T<sub>7</sub>: RNMP + Foliar application of NPK (18:18:18) @ 2 % at 30 and 45 DAS, T<sub>8</sub>: T<sub>7</sub> + Seed treatment with ammonium molybdate @ 6 g kg<sup>-1</sup> seed, T<sub>9</sub>: RNMP + Foliar application of Multi-K @ 2 % at 30 and 45 DAS, T<sub>10</sub>: T<sub>9</sub> + Seed treatment with ammonium molybdate @ 6 g kg<sup>-1</sup> seed, T<sub>11</sub>: RNMP + Foliar application of NPK (18:18:18) @ 1 % at 30 DAS + Foliar application of Multi-K @ 1 % at 45 DAS, T<sub>12</sub>: T<sub>11</sub> + Seed treatment with ammonium molybdate @ 6 g kg<sup>-1</sup> seed, T<sub>13</sub>: RNMP + NPK (18:18:18) @ 2 % at 30 DAS + Foliar application of Multi-K @ 2 % at 45 DAS and T<sub>14</sub>: T<sub>13</sub> + Seed treatment with ammonium molybdate @ 6 g kg<sup>-1</sup> seed, The experiment was laid out in RCBD with replicated thrice.

The result revealed RNMP + Seed treatment with ammonium molybdate @ 6 g kg<sup>-1</sup> seed + Foliar application of NPK (18:18:18) @ 2 % at 30 DAS + Foliar application of Multi-K @ 2 % at 45 DAS (T<sub>14</sub>) recorded significantly higher plant height (35.07 cm), number of branches per plant (10.90), number of leaves per plant (48.10), leaf area per plant (13.57 dm<sup>2</sup>), number of pods per plant (25.97), 100 kernel weight (38.67 g), haulm yield (32.17 q ha<sup>-1</sup>), kernel yield (19.67 q ha<sup>-1</sup>), pod yield (26.83 q ha<sup>-1</sup>), shelling percentage (73.77), oil content (46.83 %), oil yield (917 kg ha<sup>-1</sup>), harvest index (31 %) compared to other treatments. Similarly, available nutrients (280.03, 29.10, 166.10, 0.23 N, P<sub>2</sub>O<sub>5</sub>, K<sub>2</sub>O kg ha<sup>-1</sup> and Mo mg kg<sup>-1</sup>, respectively) nutrient uptake (49.03, 11.61, 45.47, 1.06 N, P<sub>2</sub>O<sub>5</sub>, K<sub>2</sub>O kg ha<sup>-1</sup> and g ha<sup>-1</sup> respectively) and were higher gross return (Rs 1, 20, 750 ha<sup>-1</sup>). However, due to higher unit cost of WSF higher ICBR (2.87) was recorded in RNMP + Seed treatment with @ 6 g ammonium molybdate kg<sup>-1</sup> seed + Foliar application of NPK (18:18:18) @ 1 % at 30 DAS + Foliar application of Multi-K @ 1 % at 45 DAS over control.

It is also concluded that RNMP + Seed treatment with ammonium molybdate @ 6 g kg<sup>-1</sup> seed + Foliar application of NPK (18:18:18) @ 2 % at 30 DAS + Foliar application of Multi-K @ 2 % at 45 DAS found superior with respect to yield and returns.

May, 2017

(Narayana S. Mavarkar)  
Major Advisor

## 18. Performance of Little Millet (*Panicumsumatrense* Roth ex Roem and Schult.) Genotypes for Different dates of Sowing

**ANUSHA, M. R.**

### **ABSTRACT**

A field experiment was conducted at College of Agriculture, UAHS, Shivamogga during *khariif* 2016 to study the performance of little millet genotypes for different dates of sowing. The experiment was laid out with in split plot design with three replications. There were twelve treatment combinations comprised of four dates of sowing (July last week, August 1<sup>st</sup> week, August 2<sup>nd</sup> week and August 3<sup>rd</sup> week) and three varieties (Hiriyur local, BL-6 and OLM-203) as main and subplots respectively.

Among the dates of sowing, July last week sown crop recorded significantly higher plant height (98.70cm), total dry weight (23.36 g plant<sup>-1</sup>), leaf area (461.91 cm<sup>2</sup> plant<sup>-1</sup>), leaf area index (1.54), grain yield (1290 kg ha<sup>-1</sup>) and stover yield (1569 kg ha<sup>-1</sup>) compared to other dates of sowing. Among the varieties tested Hiriyur local recorded significantly higher number of tillers (12.8), leaf area (471.44 cm<sup>2</sup> plant<sup>-1</sup>), total dry weight (23.25 g plant<sup>-1</sup>), leaf area index (1.57), grain yield (1283 kg ha<sup>-1</sup>) and stover yield (1542 kg ha<sup>-1</sup>) followed by OLM-203 which recorded higher leaf area (408.02 cm<sup>2</sup> plant<sup>-1</sup>), total dry weight (16.18 g plant<sup>-1</sup>), leaf area index (1.36), grain yield (1016 kg ha<sup>-1</sup>) and stover yield (1232 kg ha<sup>-1</sup>), respectively.

However, Hiriyur local sown on July last week recorded higher net returns (₹ 43,782 ha<sup>-1</sup>) and BC ratio (1.98) followed by OLM-203, which recorded net returns of ₹20,963 ha<sup>-1</sup> and BC ratio 1.46. Study revealed that superiority of Hiriyur local at different tested dates of sowing. As an alternative OLM-203 with July last week or for delayed situations may be considered.

July, 2017

(T. Basavaraj Naik)  
Major Advisor

## 19. Management of Nutrients through Organic Manures in SRI Method of Rice Cultivation for Coastal Karnataka

**ASHWINI, M.**

### **ABSTRACT**

A field experiment was conducted during *kharif*, 2016 at Zonal Agricultural and Horticultural Research Station, Brahmavara, UAHS, Shivamogga to study the effect of different organic manures on growth and yield of rice under SRI method of cultivation. The experiment was laid out in Randomised Complete Block Design with seven treatments replicated four times. The treatment consisted of vermicompost, poultry manure, fish meal to substitute 75 and 50 per cent recommended dose of nitrogen. Top dressing was done thrice with cow urine to substitute 25 and 50 per cent of nitrogen.

Among the treatments, application of 75 per cent recommended dose of nitrogen through vermicompost + 25 per cent recommended dose of nitrogen through cow urine produced significantly higher grain and straw yield (5,710 and 7,845 kg ha<sup>-1</sup>, respectively), followed by 100 per cent recommended dose of fertilizers (60:30:60 kg ha<sup>-1</sup>) recording higher grain and straw yield (5515 and 7632 kg ha<sup>-1</sup>, respectively). This was mainly due to growth attributing parameters like plant height (114.03 cm), number of leaves per plant (82.85), number of tillers per plant (29.30), leaf area per plant (2273.46 cm<sup>2</sup>), total dry matter production per plant (115 g) and yield contributing characters like panicle length (24.33 cm), panicle weight (3.80 g), 1000 grain weight (24.83 g), number of filled grains per panicle (124.23) and harvest index (0.420). The above treatment also recorded higher nutrient uptake of nitrogen, phosphorous and potassium (107.98, 22.99 and 81.07 kg ha<sup>-1</sup>, respectively) and gave higher benefit cost ratio (1.46) and net returns (₹ 39,238).

August, 2017

(Hanumanthappa. M)  
Major Advisor

## 20. Effect of Different Fertilizer Levels on Productivity and Profitability of Little Millet (*Panicum sumatrense* Roth ex Roem. & Schult)

**DIVYASHREE, U.**

### **ABSTRACT**

A field experiment was conducted during 2016-17 at Agronomy field unit, UAHS, Shivamogga. The experiment was laid out in Randomized Complete Block Design with twelve treatments replicated thrice. The soil of the experimental site was acidic in reaction, low in available nitrogen, high in available phosphorus and medium in available potassium status. The test variety was Hiriyr local. The treatments comprised of combinations of three levels of nitrogen (10, 20 and 30 kg N ha<sup>-1</sup>), two levels of phosphorus (10 and 20 kg P ha<sup>-1</sup>), and two levels of potassium (0 and 10 kg K ha<sup>-1</sup>). Among the different combinations of NPK fertilizers tested, application of 30 kg nitrogen and 20 kg phosphorus with or without 10 kg K ha<sup>-1</sup> performed better. However, 30:20:10 kg NPK ha<sup>-1</sup> recorded significantly taller plants (71.27 cm), higher number of leaves (40.87 plant<sup>-1</sup>), number of tillers (10.87 plant<sup>-1</sup>), leaf area (514.59 cm<sup>2</sup> plant<sup>-1</sup>), total dry matter accumulation (24.25 g plant<sup>-1</sup>), number of productive tillers plant<sup>-1</sup> (9.4), panicle length (13.43 cm), number of grains panicle<sup>-1</sup> (592), test weight (3.39 g), grain yield (1580 kg ha<sup>-1</sup>) and straw yield (1603 kg ha<sup>-1</sup>). Higher total uptake of Nitrogen (35.48 kg ha<sup>-1</sup>), Phosphorus (13.23 kg ha<sup>-1</sup>), Potassium (25.01 kg ha<sup>-1</sup>) was also recorded in the same treatment. The agronomic nutrient use efficiency of N, P and K was found higher in the treatment supplied with 30:20:10 kg NPK ha<sup>-1</sup> (4.37, 7.31 and 8.09 kg grain kg<sup>-1</sup> nutrient applied respectively) and recovery efficiencies were also found higher. Higher gross returns (₹ 87,015), cost of cultivation (₹ 47,118), net returns (₹ 39,897), B : C (1.85) was recorded in the treatment supplied with 30:20:10 kg NPK ha<sup>-1</sup> and found better for light soils.

July, 2017

(Dinesh Kumar, M)  
Major Advisor

## 21. Performance of Chia (*salvia hispanica* L.) a Super Food Crop Under Different Spacings and Fertilizer Levels in Southern Transition Zone of Karnataka

**JEENA MARY**

### **ABSTRACT**

A field experiment was conducted during *Kharif*2016 at the research field, College of Agriculture, Shivamogga to determine the 'Performance of Chia (*Salvia hispanica* L.) a super food crop under different spacings and fertilizer levels in Southern Transition Zone of Karnataka'. The experiment consisted of three levels of spacings ( $S_1$ : 60cm x 22.5cm,  $S_2$ : 60cm x 30cm and  $S_3$ : 60cm x 45cm) and three levels of fertilizers ( $F_1$ : 30:20:25 kg NPK ha<sup>-1</sup>,  $F_2$ : 60:40:50 kg NPK ha<sup>-1</sup> and  $F_3$ : 90:60:75 kg NPK ha<sup>-1</sup>). Experimental design adopted was two factor symmetrical experiment with RCBD having three replications. Crop was first established in nursery and then transplanted in main field at 18 days after sowing. Full dose of phosphorus and potassium fertilizers were applied as basal while, half of nitrogen was applied as basal and remaining half was applied 20 days after transplanting as top dressing. Variety used was CHI Ampion B-1. Result of study shown significant increase in yield level with spacing, 60cm x 45cm (597.59 kg ha<sup>-1</sup>) and fertilizer level, 90:60:75 kg NPK ha<sup>-1</sup> (623.60 kg ha<sup>-1</sup>). Significant yield (676.58 kg ha<sup>-1</sup>) obtained in treatment combination, 60cm x 45 cm with 90: 60: 75 kg NPK ha<sup>-1</sup> compared to other treatment combinations. Oil per cent showed significantly different result with fertilizer dosage and gave significantly superior oil (30.64 %) at lower fertilizer dosage. Protein content in seeds increased significantly with increase in fertilizer levels and recorded significantly higher per cent in  $F_3$  (23.85 %) and was superior to  $F_2$  (21.50 %) and  $F_1$  (20.17 %). Oil and protein per cent were not significantly influenced by the interaction of spacing and fertilizer levels. Further, the treatment combination,  $S_3F_3$  resulted higher net returns (₹162138.60 ha<sup>-1</sup>) and B:C (4.97).

July, 2017

(H.K. Veeranna)  
Major Advisor

## 22. Effect of Different Potassium Levels and Time of Application on Growth and Yield of Finger Millet under Drill Sown and Transplanted Conditions

**KAVYASHREE, N.**

### **ABSTRACT**

A field experiment was conducted at Agricultural and Horticultural Research Station, Bavikere, UAHS, Shivamoggato study the effect of different potassium levels and time of application on growth and yield of finger millet under drill sown and transplanted conditions during *Kharif* 2016. The experiment was laid out in RCBD factorial concept with three replications. There were 12 treatments comprising of two methods of establishment (drill and transplanted), three levels of potassium application (25, 37.5 and 50 kg ha<sup>-1</sup>) and two different times of application of potassium (basal and split).

Among the methods of establishment, transplanting method recorded significantly taller plants (105.87 cm), total dry matter accumulation (43.58 g plant<sup>-1</sup>), number of ear heads (4.28 hill<sup>-1</sup>), test weight (3.19 g), grain yield (3,300 kg ha<sup>-1</sup>) and straw yield (6,270 kg ha<sup>-1</sup>) compared to drill sown method. Application of K<sub>2</sub>O @ 37.5 kg ha<sup>-1</sup> recorded significantly taller plants (107.80 cm), total dry matter accumulation (45.09 g), number of ear heads (4.43 hill<sup>-1</sup>), test weight (3.21 g), grain yield (3,467 kg ha<sup>-1</sup>) and straw yield (6,445 kg ha<sup>-1</sup>) as compared to other levels of potassium. Basal application of potassium recorded significantly higher plant height (104.44 cm), total dry matter accumulation (41.99 g plant<sup>-1</sup>), number of ear heads (4.21 hill<sup>-1</sup>), test weight (3.11 g), grain (3,203 kg ha<sup>-1</sup>) and straw yield (6,179 kg ha<sup>-1</sup>) compared to split application.

Among the combinations, basal application of 37.5 kg K<sub>2</sub>O ha<sup>-1</sup> at the time of transplanting was recorded maximum grain yield (3,589 kg ha<sup>-1</sup>), straw yield (6,559 kg ha<sup>-1</sup>), nutrient uptake (94.15, 34.39 and 71.95 NPK kg ha<sup>-1</sup>, respectively), gross returns (Rs. 10,7051 ha<sup>-1</sup>), net returns (Rs. 76,238 ha<sup>-1</sup>) and benefit cost ratio (3.47) and hence found feasible.

July, 2017

(C. Sunil)  
Major Advisor

## 23. Response of different Genotypes and Fertilizer Levels on Growth and Yield of Finger Millet (*Eleusine coracana* (L.) in Bhadra command area.

**MANMOHAN, K**

### **ABSTRACT**

A field experiment was conducted during 2016 at Agricultural and Horticultural Research Station, Kathalagere, University of Agricultural and Horticultural Sciences, Shivamogga to study the response of different genotype's and fertilizer levels on growth and yield of finger millet in Bhadra command area. The experiment was laid out in RCBD (Factorial concept) with three genotypes (KMR-340, KMR-630 and KMR-301) and three fertilizer levels (100 per cent RDF- 100:50:50 kg NPK ha<sup>-1</sup>, 125 per cent RDF- 125:62.5:62.5 kg NPK ha<sup>-1</sup> and 150 per cent RDF- 150:75:75 kg NPK ha<sup>-1</sup>) replicated three times. The results revealed that genotypes, KMR-301 recorded significantly higher plant height (115.44 cm), number of finger earhead<sup>-1</sup> (7.06), total dry matter production (37.57 g plant<sup>-1</sup>) and grain yield (37.03 q ha<sup>-1</sup>) as compared to other genotypes (KMR-340 and KMR-630). Similarly, 150 per cent RDF recorded significantly higher plant height (113.56 cm), number of finger earhead<sup>-1</sup> (6.84), total dry matter production (36.55 g plant<sup>-1</sup>) and grain yield (35.90q ha<sup>-1</sup>) followed by 125 per cent of RDF. Among the interaction, KMR-301 with 150 per cent RDF recorded significantly higher grain yield (40.23 q ha<sup>-1</sup>) and it was on-par with genotype KMR-301 with 125 per cent RDF. Similarly, higher nutrient uptake was observed in KMR- 301 genotype (nitrogen of 91.2, phosphorous of 32.06 and potassium of 71.11 kg ha<sup>-1</sup> respectively). Similar trend was observed in 150 per cent RDF (nitrogen of 89.94, phosphorous of 31.62 and potassium of 70.00 kg ha<sup>-1</sup> respectively). Growing KMR-301 with 150 per cent RDF was recorded higher net returns (₹ 76529 ha<sup>-1</sup>) and higher B: C ratio (2.67) it was on-par with 125 per cent RDF. In the farmers point of view growing new genotype KMR-301 with 125 per cent of RDF was found better treatment combination for getting higher yield and net return.

August, 2016

(Kumara O.)  
Major Advisor

## 24. Effect of Sulphur on Growth, Yield and Quality of Castor (*Ricinus communis* L.) Hybrids under Central Dry Zone of Karnataka.

**MUNESHKUMAR V. KUGATI**

### **ABSTRACT**

A field experiment was conducted during 2016 at Zonal Agricultural and Horticultural Research station, Hiriyur, UAHS, Shivamogga to study the effect of sulphur on growth, yield and quality of castor hybrid under central dry zone of Karnataka. The experiment was laid out in RCBD (Factorial concept) with three sources of sulphur on three castor hybrids replicated three times. The sources of sulphur used were gypsum, single super phosphate and elemental sulphur while different hybrids include DCH-177, HCH-6 and YRCH-1. Among the sources of sulphur application of sulphur at 20 kg per hectare through gypsum recorded significantly higher plant height (113.96 cm), total biomass (5652.67 kg ha<sup>-1</sup>) and seed yield (1308.32 kg ha<sup>-1</sup>) as compared to other sources. Among the hybrids DCH-177 recorded significantly higher plant height (108.43 cm), total biomass (5603.5 kg ha<sup>-1</sup>) and seed yield (1226.84 kg ha<sup>-1</sup>) as compared to HCH-6 and YRCH-1. Among the interactions application of sulphur at 20 kg per hectare through gypsum with DCH-177 resulted in higher total biomass (5851.68 kg ha<sup>-1</sup>) and seed yield (1388.88 kg ha<sup>-1</sup>) than other interactions. Similarly higher uptake of nitrogen (78.70 kg ha<sup>-1</sup>), phosphorous (17.20 kg ha<sup>-1</sup>), potassium (70.60 kg ha<sup>-1</sup>) and sulphur (5.70 kg ha<sup>-1</sup>) was recorded with the same treatment. Higher cost of cultivation (Rs.16131 ha<sup>-1</sup>), net returns (Rs.32480 ha<sup>-1</sup>) and higher B: C ratio (2.50) was observed in application of sulphur at 20 kg per hectare through gypsum with DCH-177 hybrid.

September, 2017

(Basavalingaiah)  
Major Advisor

## 25. Efficacy of Herbicide Molecule for Weed Management in Transplanted Paddy for Kodagu Region

**RAJATH, H. P.**

### **ABSTRACT**

A field experiment entitled 'Efficacy of herbicide molecule for weed management in transplanted paddy for Kodagu region' was conducted during *Khari* 2016 at AHRS, Ponnampet to screen suitable herbicides for weed management in paddy. The herbicides tried were butachlor @ 30 kg ha<sup>-1</sup> at 3 DAT, oxadiargyl @ 100 g a.i. ha<sup>-1</sup> at 3 DAT, bensulfuron methyl @ 60 g a.i. ha<sup>-1</sup> + pretilachlor @ 600 g a.i. ha<sup>-1</sup> at 3 DAT, ethoxysulfuron @ 18.75 g a.i. ha<sup>-1</sup> at 20 DAT, bispyribac-Na @ 20 g a.i. ha<sup>-1</sup> at 20 DAT, penoxsulum @ 22.5 g a.i. ha<sup>-1</sup> at 20 DAT and 2,4 D @ 2.5 kg ha<sup>-1</sup> at 3 weeks after transplanting. Hand weeding twice at 20 and 40 DAT and weedy check treatments were also included for comparison. The predominant weed flora observed in the experimental field includes *Fimbristylis miliacea*, *Echinochloa* spp., *Monochoria vaginalis*, *Ammannia baccifera* and *Ludwigia parviflora*. Among herbicides, sequential application of oxadiargyl followed by penoxsulum recorded significantly lower weed population (10.60 to 34.28 / 0.25 m<sup>2</sup>) and dry weight (0.94 to 3.46 g / 0.25 m<sup>2</sup>) as which resulted in significantly higher grain yield (4068 kg ha<sup>-1</sup>). It was closely followed by combined application of oxadiargyl @ 100 g a.i. ha<sup>-1</sup> at 3 DAT followed by bispyribac-Na @ 20 g a.i. ha<sup>-1</sup> at 20 DAT yielded 3907 kg ha<sup>-1</sup> with moderate control of weeds. Weedy check recorded 55.23 per cent reduction in grain yield compared to the above treatment. Major nutrients uptake by paddy crop was significantly higher while it was lower in weeds by all weed control treatments compared to weedy check. The maximum net returns of ₹ 29,962 ha<sup>-1</sup> and profit of 1.63 per every rupee spent was achieved with the same treatment.

August, 2017

(Jadeyegowda, M.)  
Major Advisor

## 26. Nitrogen and Potassium Management for Mechanized Rice Cultivation in Coastal Zone of Karnataka State

**VANIJA, S.**

### **ABSTRACT**

A field experiment was conducted during *Kharif* 2016 at Zonal Agricultural and Horticultural Research station, Brahmavar, Udupi, Karnataka to study the nitrogen and potassium management for mechanized rice cultivation in coastal zone of Karnataka. The experiment was laid out in RCBD with 10 treatments and replicated thrice. The treatments consisted of combination of 3 levels (60, 75 and 95 kg ha<sup>-1</sup>) each of nitrogen and potassium with recommended level of phosphorus (30 kg ha<sup>-1</sup>) and an absolute control. Nitrogen was applied in 3 splits (50 % as basal, 25 % each at 30 and 55 DAT) whereas potassium was applied in 2 splits (50% as basal and 50 % at 55 DAT) and entire phosphorous was applied in a single basal dose.

Results revealed that the application of 90: 30: 60 kg NPK ha<sup>-1</sup> produced significantly higher grain and straw yield (5900 and 7567 kg ha<sup>-1</sup>, respectively) as compared to recommended dose of fertilizer (60: 30: 60 kg NPK ha<sup>-1</sup>). The same treatment combination recorded significantly higher plant height (99.53 cm), number of tillers (32.17), number of leaves per hill (103.51), leaf area per hill (2380.65 cm<sup>2</sup>), total dry matter production (63.10 g hill<sup>-1</sup>) and yield attributing characters like number of productive tillers per hill (30.73), panicle length (29.00), panicle weight (5.46 g per panicle), number of filled grains per panicle (142.10) and harvest index (0.439). the total nutrient uptake of nitrogen, phosphorus and potassium (136.83, 36.94 and 128.44 kg ha<sup>-1</sup>, respectively) with higher benefit cost ratio (2.16) and net returns (₹ 73,517) were found in the same treatment (90: 30: 60 kg NPK ha<sup>-1</sup>) followed by the application of 90: 30: 75 kg NPK ha<sup>-1</sup>.

July, 2017

(Sudhir Kamath K V)  
Major Advisor

## 27. Performance of Sweet Corn (*Zea mays L. saccharata* Strut.) under Graded Levels of Fertilizers in Southern Transitional Zone of Karnataka

**VIDYASHREE, M. R**

### **ABSTRACT**

A field experiment was conducted at College of Agriculture, Shivamogga, during *Kharif* 2016. The texture of soil was red sandy loam having acidic pH, poor in nitrogen, rich in phosphorus and medium with respect to potassium status. The experiment was laid out in Randomized Block Design with three replications. Three levels of N (75 %, 100 % and 125 % of RDN), two levels of P (75 % and 100 % of RDP) and three levels of K (75 %, 100% and 125 % of RDK) formed 18 different treatment combinations.

Application of 125 % of RDN + 100 % of RDP + 125 % of RDK produced fresh cob yield of 13.7 t ha<sup>-1</sup> which was 23.42 % higher over 100 % of RDN + 100 % of RDP + 100 % of RDK and 45.74 % over 75 % of RDN + 75% of RDP + 75 % of RDK (9.4 t ha<sup>-1</sup>). Further, there were improvement in other yield characters due to manifestation of improved growth characters as a result of higher uptake of nutrients caused by application of higher NPK fertilizers. The application of 125 % of RDN + 100 % of RDP + 125 % of RDK also increased the reducing sugars, non reducing sugars and crude protein content (3.83 %, 23.59 % and 10.87 % respectively) as compared 75 % of RDN + 75% of RDP + 75 % of RDK (2.09%, 18.0%, and 8.27% respectively). Application of 125 % of RDN + 100 % of RDP + 125 % of RDK is more cost effective (4.78 B:C) and remunerative with higher net return to the tune of ₹3,45,043 ha<sup>-1</sup> as compared to other treatments.

July, 2017

(Narayana S Mavarkar)  
Major Advisor

## 28. Herbage Yield and Nutrient Composition of Fodder Maize based Intercropping in Rainfed Situation of Southern Transitional Zone (STZ)

**ASHWINI ASHOK YARJARVI**

### **ABSTRACT**

A field experiment was conducted at Agricultural and Horticultural Research Station Bhavikere, UAHS, Shivamogga during *kharif*2017 to study the herbage yield and nutrient composition of fodder maize based intercropping in rainfed situation of southern transition zone. The texture of the soil is sandy loam having acidic pH (5.25) with low organic carbon (0.40 %) and available nitrogen ( $220.80 \text{ kg ha}^{-1}$ ), phosphorous ( $33.90 \text{ kg ha}^{-1}$ ) and potassium ( $163.60 \text{ kg ha}^{-1}$ ) status. The test variety for maize was South African Tall. The experiment was laid out in a Randomized Complete Block Design with nine treatments replicated thrice. The treatment comprised of sole fodder maize, fodder maize based intercropping with different legumes (cowpea, horsegram, local fieldbean and guar) in 3:1 and 2:1 row ratios. Sole fodder maize recorded significantly higher growth parameter like plant height (285.60 cm), number of leaves (14.13), leaf area ( $52.37 \text{ dm}^2 \text{ plant}^{-1}$ ) and dry matter accumulation ( $236.34 \text{ g plant}^{-1}$ ). The intercropping treatment fodder maize + cowpea (3:1) recorded significantly higher green fodder yield ( $76.15 \text{ t ha}^{-1}$ ), dry fodder yield ( $25.34 \text{ t ha}^{-1}$ ) along with maximum nutrients uptake (290.76, 53.70 and  $296.32 \text{ NPK kg ha}^{-1}$  respectively). Further, quality parameters such as crude protein (9.81 and 14.51 %) ash content (10.09 %) ether extract (2.65 %) were found higher which is also recorded significantly lower crude fibre (20.13 and 19.58 %), neutral detergent fibre (75.97, 68.31 %) and acid detergent fibre (57.70, 41.36 %) was found in the above treatment. Higher net return ( $\text{Rs.}61,937 \text{ ha}^{-1}$ ) was also registered in fodder maize + cowpea (3:1) intercropping whereas, higher benefit cost ratio (3.08) was obtained with intercrop of fodder maize with cowpea (2:1).

July, 2018

(T. Basavaraj Naik)  
Major Advisor

## 29. Characterization of Occurrence and Frequency of Drought and Evaluation of Drought Management Options for Maize under Rainfed Conditions

**CHAITHRA, G.M.**

### **ABSTRACT**

The analysis of 51 years of monthly rainfall over different talukas of Chitradurga, Davanagere and Shivamogga districts and calculation of SPI was done for the characterization of occurrence and frequency of drought. In Chitradurga district, Molkalmuru taluka had recorded maximum number of drought years (44 years). Similarly, Channagiri and Harapanahallitalukas (44 years) of Davanagere ditrict and Sagara taluka (45 years)of Shivamogga district recorded a maximum number of drought years.

A field experiment was conducted at ZAHRS,Babbur farm, Hiriyur, during *Kharif* 2017, forthe evaluation of drought management options for maize under rainfed conditions. The texture of soil was black clay having alkaline pH with available nitrogen ( $258 \text{ kg ha}^{-1}$ ), phosphorous ( $35 \text{ kg ha}^{-1}$ ) and potassium ( $315 \text{ kg ha}^{-1}$ ). The experiment was laid out in a Randomized Complete Block Design with ten treatments replicated thrice. The ten treatments comprised of pusa hydrogel and commercial hydrogel applied at  $2.5$  and  $5.0 \text{ kg ha}^{-1}$ with or without pongamia green leaf mulch at  $4.0 \text{ t ha}^{-1}$  and their combinations along with control.Among different treatment combinations soil application of commercial hydrogel at  $5.0 \text{ kg ha}^{-1}$  + mulching with pongamia green leaf at  $4.0 \text{ t ha}^{-1}$  recorded significantly higher growth parameters like number of leaves (13.10), leaf area ( $6362.84 \text{ cm}^2$ ), total dry matter production ( $296.16 \text{ g}$ ), yield attributes like cob length (18.87 cm), cob girth (14.92 cm), kernel yield( $93.20\text{q ha}^{-1}$ ), stover yield ( $117.14 \text{ q ha}^{-1}$ )andphysiological parameters like total chlorophyll content ( $2.80 \text{ mg g}^{-1}$ fresh weight) and chlorophyll stability index (83.65 %).

From the study it can be inferred that SPI can be used as an indicator of drought intensity and soil application of commercial hydrogel along with pongamia green leaf mulch can be a option for getting higher kernel yield in maize under rainfed conditions.

July, 2018

(Sridhara S)  
Major Advisor

### 30. Crop Weather Relationships in Rice (*Oryza sativa* L.) under different Methods of Establishment

**CHANDRASHEKHAR**

#### **ABSTRACT**

A field experiment was conducted at Zonal Agricultural and Horticultural Research Station, Brahmavara, UAHS, Shivamogga during *kharif* 2017 to study the crop weather relationships in rice under different methods of establishment. The experiment was laid out in split plot design with three replications. There were ten treatment combinations comprise of two rice establishment systems as main plots (conventional and System of Rice Intensification) and five dates of transplanting as sub plots (June 3<sup>rd</sup> week, July 1<sup>st</sup> week, July 3<sup>rd</sup> week, August 1<sup>st</sup> week and August 3<sup>rd</sup> week).

Among different systems of rice establishment, SRI recorded significantly higher plant height (102.99 cm), total dry weight (75.92 g hill<sup>-1</sup>), grain yield (4588 kg ha<sup>-1</sup>), straw yield (7016 kg ha<sup>-1</sup>), HUE (4.59× 10<sup>-2</sup> g °C day<sup>-1</sup>), PTUE (8.93× 10<sup>-2</sup> g °C hrs<sup>-1</sup>), HTUE (12.29× 10<sup>-3</sup> g °C day<sup>-1</sup>) and RUE (3.27 g MJ<sup>-1</sup>) compared to conventional method. Among the transplanting dates June 3<sup>rd</sup> week transplanted crop recorded significantly higher plant height (107.71 cm), total dry weight (77.01 g hill<sup>-1</sup>), grain yield (5158 kg ha<sup>-1</sup>), straw yield (7151 kg ha<sup>-1</sup>), HUE (4.81× 10<sup>-2</sup> g °C day<sup>-1</sup>), PTUE (9.17× 10<sup>-2</sup> g °C hrs<sup>-1</sup>), HTUE (16.12× 10<sup>-3</sup> g °C day<sup>-1</sup>) and RUE (3.03 g MJ<sup>-1</sup>) compared to other dates of transplanting.

Rainfall ( $r = 0.74^{**}$ ) and relative humidity ( $r = 0.68^{**}$ ) during soft dough stage to hard dough stage had positive relation with grain yield of rice. On the other hand maximum temperature from transplanting to tillering ( $r = -0.69^{**}$ ), panicle initiation to 50 % flowering ( $r = -0.96^{**}$ ), 50 % flowering to soft dough stage ( $r = -0.93^{**}$ ), soft dough stage to hard dough stage ( $r = -0.73^{**}$ ) and minimum temperature from soft dough stage to hard dough stage ( $r = -0.58^{**}$ ) had negative relationship with grain yield of rice.

July, 2018

(M. Hanumanthappa)  
Major Advisor

### **31. Effect of Foliar Application of Major Nutrients and Boron in Mechanized Rice Cultivation in Coastal Zone of Karnataka**

**GAJANANA KURI**

#### **ABSTRACT**

A field experiment was conducted during *Kharif*2017 at Zonal Agricultural and Horticultural Research Station, Brahmavar, Udupi, Karnataka to study the Effect of foliar application of major nutrients and boron in mechanized rice cultivation in coastal zone of Karnataka. The experiment was laid out in RCBD with 7 treatments and replicated thrice. The treatment combinations include Recommended dose of NPK (60:30:60 kg ha<sup>-1</sup>) as control, RDF + Foliar Spray of 19-19-19 at 1% , RDF + Foliar Spray of 19-19-19 at 1% with boron at 0.5%, RDF + Foliar Spray of 13-0-45 at 1%, RDF + Foliar Spray of 13-0-45 at 1% with boron at 0.5%, RDF + Foliar spray of 0-0-50 at 1% and RDF + Foliar Spray of 0-0-50 at 1% with boron at 0.5%. The foliar sprays were taken at 30, 60 and 90 days after transplanting.

The results revealed that application of RDF + Foliar Spray of 19-19-19 at 1% with boron at 0.5% produced significantly higher grain and straw yield (5542 and 7136 kg ha<sup>-1</sup>, respectively) as compared to recommended dose of fertilizer (4691 and 5980 kg ha<sup>-1</sup>, respectively). The same treatment combination recorded significantly higher plant height (103.63 cm), number of tillers per hill (21.1), number of green leaves per hill (81.81), total dry matter production (62.75 g hill<sup>-1</sup>) and yield attributing characters like number of productive tillers per hill (19.6), panicle length (26.1 cm), panicle weight (4.23 g per panicle), number of filled grains per panicle (106.5), harvest index (0.44) and total nutrient uptake of NPK (143.37, 38.95 and 102.80 kg ha<sup>-1</sup>, respectively) with higher benefit cost ratio (2.04) and net returns (Rs.74,015 ha<sup>-1</sup>) followed by application of RDF + Foliar Spray of 19-19-19 at 1%.

August, 2018

(Sudhir Kamath, K. V)

Major Advisor

## 32. Effect of Herbicides and Herbicides Combination in Transplanted Rice with Special Reference to *Vaucheria* Species of Yellow-Green Algae under Coastal Karnataka

MANJUNATHA, U. B

### ABSTRACT

A field experiment was conducted to evaluate the “Effect of herbicides and their combination in transplanted rice with special reference to *Vaucheria species* of yellow-green algae under coastal Karnataka” in farmer’s field at Kota, Udupi taluk. Having twelve treatments, comprised of pre-emergent (PE) herbicides *viz.*, pretilachlor 50 EC, pyrazosulfuron ethyl 10 WP, pendimethalin 38.7 CS, butachlor 50 EC and post-emergent (PoE) herbicides *viz.*, ethoxysulfuron 15 WDG, chlorimuron ethyl 10 % + metsulfuron methyl 10 % WP, bispyribac sodium 10 SC, 2,4-D sodium salt 80 WP and penoxsulam 24 % CS. The experiment was laid out in RCBD with three replications. The predominant weed flora observed other than *Vaucheria species* of yellow-green algae were *Monochoria vaginalis*, *Ludwigia parviflora*, *Marsilea quadrifolia* among dicots, *Panicum repens*, *Echinochloa colonum*, *Cyperus difformis* and *Cyperus procerus* among monocots. Experimental results revealed that, sequential application of PE pendimethalin 38.7 CS @ 750 g a.i. ha<sup>-1</sup> at 3 DAT *fb* PoE penoxsulam 24 % CS @ 22.5 g a.i. ha<sup>-1</sup> at 30 DAT recorded significantly lower fresh weight (66.21, 40.04 and 10.12 g/0.25 m<sup>2</sup>), dry weight (2.06, 1.38 and 0.73 g/0.25 m<sup>2</sup>) and higher weed control efficiency (72.53, 86.19 and 91.42 %) of yellow-green algae weed at 15, 30 and 45 DAT respectively and was on par with sequential application of PE pendimethalin 38.7 CS @ 750 g a.i. ha<sup>-1</sup> at 3 DAT *fb* PoE bispyribac sodium 10 SC @ 25 g a.i. ha<sup>-1</sup> at 30 DAT. Yield and yield attributing parameters were also significantly higher with same treatment *viz.*, panicle length (22.77 cm), filled grains (110.28 panicle<sup>-1</sup>), grain yield (5306 kg/ha) and straw yield (6219 kg/ha). The same trend was noticed with net returns (Rs. 57,151 ha<sup>-1</sup>) and profit per rupee invested (1:2.11).

December, 2018

(N. E. Naveen)  
Major Advisor

### **33. Influence of Integrated Nutrient Management Practices on Growth and Yield of Aerobic Rice (*Oryza sativa* L.)**

#### **MEGHA B ABSTRACT**

A field experiment was conducted at Agricultural and Horticultural Research Station, Bhavikere, UAHS, Shivamoggaduring *Kharif* 2017, to study the influence of integrated nutrient management practices on growth and yield of aerobic rice. The texture of soil was sandy loam having acidic pH with organic carbon of  $0.40\text{g kg}^{-1}$ , available nitrogen  $220.80\text{ kg ha}^{-1}$ , phosphorous  $33.90\text{ kg ha}^{-1}$  and potassium  $163.60\text{ kg ha}^{-1}$ . The variety used was MAS 946-1 (Sharada). The experiment was laid out in a Randomized Complete Block Design with ten treatments replicated thrice. The treatments comprised of 100 per cent RDF and 75 per cent RDF with different levels of FYM and vermicompost.

Among different treatment combinations application of 100 % RDF + 100 % Vermicompost (N Equivalent) + PGPR recorded significantly higher growth parameters like number of tillers (34.2), leaf area ( $1396.9\text{ cm}^2$ ), dry matter production (89.04 g), yield attributes like number of productive tillers per hill (16.32), panicle length (23.52 cm), panicle weight (2.68 g), number of filled grains (87.0), grain yield ( $3868.0\text{kg ha}^{-1}$ ) straw yield ( $4225.72\text{kg ha}^{-1}$ ) and total nutrient uptake of nitrogen ( $93.13\text{ kg ha}^{-1}$ ), phosphorus ( $25.05\text{ kg ha}^{-1}$ ), and potassium ( $92.63\text{ kg ha}^{-1}$ ). The yield increment was 27 per cent over the control.

Higher gross returns and net returns were registered with 100 % RDF + 100 % Vermicompost (N Equivalent) + PGPR (Rs. 81,228, Rs.45,175) whereas, higher benefit cost ratio (2.87) was obtained with application of 75% RDF +25% vermicompost (N Equivalent) + PGPR.

July, 2018

(C. J. Sridhara)  
Major Advisor

### 34. Performance of Groundnut Genotypes under Different Sowing Windows in Southern Transition Zone of Karnataka

**K. RAAGAVALLI**

#### **ABSTRACT**

A field experiment was conducted during *Kharif*-2017 on “Performance of groundnut genotypes under different sowing windows in Southern Transition Zone of Karnataka” at AHRS, Bavikere, UAHS, Shivamogga, on sandy loam soils, under rainfed conditions. The experiment was laid out using Randomized complete block design with factorial concept, consisting of two factors; groundnut genotypes (GKVK-5, GPBD-4, G2-52 and TMV-2) and sowing windows (II fortnight of June, I fortnight of July, II fortnight of July and I fortnight of August), each with four levels forming sixteen treatments in three replications.

The groundnut genotype, GKVK-5 showed significantly higher pod yield ( $16.73 \text{ q ha}^{-1}$ ) and kernel yield ( $12.17 \text{ q ha}^{-1}$ ) than other genotypes. The yield components such as, pod weight per plant (9.36 g), hundred-kernel weight (39.71 g) and shelling per cent (72.65); and growth parameters, contributed to the increase in pod yield of the genotype GKVK-5. However, the genotype G2-52 recorded significantly higher pod number per plant (13.34) while the oil content and oil yield were significantly higher in the genotype GKVK-5 (41.23 % and  $5.04 \text{ q ha}^{-1}$ , respectively). Significantly higher percentage disease incidence (0.579), larval infestation of *Amsactaalbistriga* (0.06) and *Spodopteralitura* (0.26) were noticed in TMV-2. Higher yield of pod, kernel and oil (15.20, 11.13 and  $5.07 \text{ q ha}^{-1}$ , respectively) were found in the crop sown during II fortnight of June. The pod yield ( $15.20 \text{ q ha}^{-1}$ ), kernel yield ( $11.13 \text{ q ha}^{-1}$ ) and oil yield ( $5.07 \text{ q ha}^{-1}$ ) were higher when the crop was sown during II fortnight of June, due to increase in the growth parameters, pod number per plant (11.74), pod weight per plant (8.53 g), hundred-kernel weight (40.38 g), shelling per cent (73.15) and oil content (45.58 %). With delay in sowing, the pod yield and kernel yield reduced, while the incidence of disease and pest infestation increased. The genotype GKVK-5 sown during II fortnight of June recorded higher pod yield ( $18.07 \text{ q ha}^{-1}$ ) and kernel yield ( $13.37 \text{ q ha}^{-1}$ ) compared to other treatment combinations.

August, 2018

(T. M. Soumya)  
Major Advisor

### **35. Effect of Soil and Foliar Application of Humic Substances as a Biostimulants on Biomass, Nutrient Uptake and Quality of Soybean [*Glycine max* (L.) Merrill]**

**SAVITA S PASHUPATIMATH**

#### **ABSTRACT**

A field experiment to study the “Effect of soil and foliar application of humic substances as a biostimulants on biomass, nutrient uptake and quality of soybean [*Glycine max* (L.) Merrill]” was carried out at College of Agriculture, Shivamogga, under rainfed conditions during *kharif*, 2017. The experiment was laid out under Randomized Complete Block Design with ten treatments replicated thrice. The treatment combinations include POP + soil application of humic substances @ 2.5 and 5.0 kg ha<sup>-1</sup> at sowing, POP + foliar application of humic substances @ 0.2 per cent from commercial source and extracted from vermicompost at 40 days after sowing (DAS), interaction of the above soil and foliar applications, tested against FYM+ recommended NPK and vermicompost on FYM ‘N’ equivalent basis + recommended NPK. Application of vermicompost on FYM ‘N’ equivalent basis (2.76 t ha<sup>-1</sup>) + recommended NPK recorded significantly higher biomass (5090 kg ha<sup>-1</sup>), grain (1957 kg ha<sup>-1</sup>), protein (847.5 kg ha<sup>-1</sup>) and oil (409.4 kg ha<sup>-1</sup>) yields of soybean along with maximum nutrients uptake (208.4, 22.3 and 111.6 kg NPK ha<sup>-1</sup>, respectively). Among humic substances treatment, POP + soil application of humic substances @ 5 kg ha<sup>-1</sup> at sowing + foliar application of humic substances @ 0.2 per cent extracted from vermicompost or commercial product application at 40 DAS recorded higher yield plant<sup>-1</sup> (13.97 and 13.84 g, respectively), biomass (4603 and 4448 kg ha<sup>-1</sup>, respectively), grain (1741 and 1676 kg ha<sup>-1</sup>, respectively), protein (766.4 and 733.3 kg ha<sup>-1</sup>, respectively) and oil (357.1 and 335.0 kg ha<sup>-1</sup>, respectively) yield with higher nutrients uptake (193.7, 19.6, 100.3 and 182.7, 18.3, 96.4 kg NPK ha<sup>-1</sup>, respectively). Grain yield improvement was to an extent of 29.76 and 24.89 per cent due to application of vermicompost on FYM ‘N’ equivalent basis+ recommended NPK and soil application of humic substances @ 5 kg ha<sup>-1</sup> at sowing + foliar application of humic substances (0.2%) extracted from vermicompost at 40 DAS, respectively compare to FYM+ recommended NPK only.

August, 2018

(G. K. Girijesh)  
Major Advisor

**36. Effect of graded levels of nitrogen and potassium on growth, yield and quality of potato (*Solanumtuberosum* L.)**

**SHRUTHI G**

**ABSTRACT**

A field experiment was conducted during *Kharif* 2017 at College of Horticulture, Mudigere, to study the “Effect of graded levels of nitrogen and potassium on growth, yield and quality of potato (*Solanumtuberosum* L.)” The texture of soil was red sandy loam having acidic pH (6.15) and organic carbon (0.47 g kg<sup>-1</sup>). The soil status was medium for available nitrogen (325.00 kg ha<sup>-1</sup>), high for available P<sub>2</sub>O<sub>5</sub> (62.01 kg ha<sup>-1</sup>) and low for K<sub>2</sub>O(102.27 kg ha<sup>-1</sup>). The test variety was KufriJyothi. The experiment was laid out in Randomized Complete Block Design (RCBD) with factorial concept having nine treatments replicated four times. The treatment combinations include three levels of nitrogen (100, 150 and 200 kg N ha<sup>-1</sup>) and three levels of potassium (100, 150 and 200 kg K<sub>2</sub>O ha<sup>-1</sup>). The investigation revealed that application of 200 kg N ha<sup>-1</sup> along with 200 kgK<sub>2</sub>O ha<sup>-1</sup>recorded maximum tuber (19.57 t ha<sup>-1</sup>) and marketable (17.30 t ha<sup>-1</sup>) yield. The same treatment also recorded significantly higher plant height (70.90 cm), number of shoots (4.10 plant<sup>-1</sup>), number of leaves (114.10 plant<sup>-1</sup>), leaf area (2042 cm<sup>2</sup> plant<sup>-1</sup>) at 80 DAP along with tuber weight (234.72 g plant<sup>-1</sup>), number of tubers (7.27 plant<sup>-1</sup>).Total soluble solids (6.70 °Brix), reducing sugar (0.92 %), and nutrient uptake (187.13, 36.40 and 187.50kg N, P<sub>2</sub>O<sub>5</sub> and K<sub>2</sub>O ha<sup>-1</sup>, respectively) were also found higher in the above treatment. Net returns ( ₹ 2,51,426 ha<sup>-1</sup>) and BC ratio (3.66) wererecorded higher with theApplication of 200 kg N ha<sup>-1</sup> and 200 kg K<sub>2</sub>O ha<sup>-1</sup>compared to other treatments.

August, 2018

(Shivaprasad, M.)  
Major Advisor

### **37. Evaluation of Suitable Groundnut (*Arachis hypogaea* L.) Based Millets Intercropping System in Central Dry Zone of Karnataka under Rainfed Condition**

**SHWETHANJALI, K. V.**

#### **ABSTRACT**

A field experiment was conducted at Zonal Agricultural and Horticultural Research Station, Babbur farm, Hiriyyur, under AICRP (groundnut) during *Kharif* 2017, to study the evaluation of suitable groundnut based millets intercropping system in Central Dry Zone of Karnataka under rainfed condition. The texture was medium black soil having alkaline pH (8.10) with available nitrogen (258 kg ha<sup>-1</sup>), phosphorous (35 kg ha<sup>-1</sup>) and potassium (315 kg ha<sup>-1</sup>). The experiment was laid out in a Randomized Complete Block Design with ten treatments replicated thrice. The test varieties include G-2-52, ML-365, Sukshema and HMT100-1 for groundnut, finger millet, little millet and foxtail millet, respectively. The treatments consisted of sole and intercrop of groundnut with millets (finger millet, little millet and foxtail millet) in 5:2 and 6:1 row ratios. Sole groundnut noticed significantly higher pod yield (1862 kg ha<sup>-1</sup>) and haulm yield (2618 kg ha<sup>-1</sup>) over intercropping treatments. Among the intercropping treatments, pod and haulm yield of groundnut was higher in 6:1 row ratio of groundnut + foxtail millet (1744 kg ha<sup>-1</sup> and 2194 kg ha<sup>-1</sup>, respectively). Higher yield was mainly attributed to higher plant height (34.14 cm), number of branches (10.52), number of leaflets (79.33), leaf area (1265 cm<sup>2</sup> plant<sup>-1</sup>), leaf area index (4.22), leaf area duration (135.5 days), total dry matter accumulation (28.81 g plant<sup>-1</sup>), number of pods plant<sup>-1</sup> (26.46), pods weight plant<sup>-1</sup> (13.09 g) and test weight (35.29 g). Significantly higher groundnut equivalent yield (1877 kg ha<sup>-1</sup>) and ATER (1.10) were also registered with same treatment. Whereas, higher LER (1.16) was noticed with 5:2 row ratio of groundnut + foxtail millet intercropping treatment. At harvest, significantly higher nutrient uptake (70.98, 20.65 and 57.67 kg NP and K ha<sup>-1</sup>, respectively) was observed with groundnut + foxtail millet in 6:1 row ratio. Higher net returns (Rs. 50,469 ha<sup>-1</sup>) and B:C (2.23) were also realized with the same treatment.

August, 2018

(Kumar Naik, A. H.)  
Major Advisor

### **38. 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 which Bengaluru 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 Kharif rice 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

### **39. 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 kharif 2018, 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) with organic carbon of 4.56 g kg<sup>-1</sup>, available nitrogen 240.32 kg ha<sup>-1</sup>, available phosphorus 76.09 kg ha<sup>-1</sup> and potassium 136.73 kg ha<sup>-1</sup>. The variety used was KKM-3. The experiment was laid out in a Randomized Complete Block Design with thirteen treatments replicated thrice. 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 higher plant height (56.04 cm), number of leaves plant<sup>-1</sup> (8.46), leaf area (5.37 dm<sup>2</sup> plant<sup>-1</sup>), total dry matter production (22.16 g plant<sup>-1</sup>), number of pods plant<sup>-1</sup> (22.10), number of seeds pod<sup>-1</sup> (12.65), pod length (8.92 cm), seed yield (1038.82 kg ha<sup>-1</sup>) and haulm yield (1675.28 kg ha<sup>-1</sup>) and the same treatment recorded significantly higher total nutrient uptake of nitrogen (67.90 kg ha<sup>-1</sup>), phosphorus (5.69 kg ha<sup>-1</sup>), potassium (60.75 kg ha<sup>-1</sup>). The yield increment was 25.07 per cent over the package of practice.

Higher gross return (₹ 76470 ha<sup>-1</sup>) and net returns (₹ 49020 ha<sup>-1</sup>) 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

## **40. 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 Transitional Zone of Karnataka. The texture of the soil was Sandy loam and having acidic pH with low organic carbon and available nitrogen. Available Phosphorous 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<sup>-1</sup>) +PGPR + 20:20:20 Water soluble fertilizers gave significantly higher growth parameters like more number of leaves plant<sup>-1</sup> (108.42), more number of tillers plant<sup>-1</sup>(22.56), higher the leaf area(798.33 cm<sup>2</sup>), more total dry matter production (80.23g) and yield parameters like more number of paniclesplant<sup>-1</sup>(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<sup>-1</sup>), higher straw yield (5476.67 Kg ha<sup>-1</sup>) and more harvest index (0.48) as compared to other treatments and total nutrient uptake of nitrogen (137.38Kg ha<sup>-1</sup>), phosphorus (28.83Kg ha<sup>-1</sup>) and potassium (118.17Kg ha<sup>-1</sup>). 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

## **41. Conjunctive Use of Sewage and Irrigable Water on Performance of Groundnut (*Arachis hypogaea*.) 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<sup>-1</sup>), oil yield (893.11kg ha<sup>-1</sup>), protein content (25.73 %) of groundnut along with increased available nutrient status in the soil (296.16, 84.13, 128.84 kg NPK ha<sup>-1</sup>). 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<sup>-1</sup>), oil yield (843.14 and 807.51kg ha<sup>-1</sup>), 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<sup>-1</sup>). Highest gross returns (₹ 1,00,360`ha<sup>-1</sup>), net returns (₹ 70,933 ha<sup>-1</sup>) 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

## **42. 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<sup>-1</sup>), available P<sub>2</sub>O<sub>5</sub> (82.46 kg ha<sup>-1</sup>) and available K<sub>2</sub>O (68.19 kg ha<sup>-1</sup>) 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<sup>-1</sup>), total dry matter accumulation (125.12 g plant<sup>-1</sup>), number of fruits plant<sup>-1</sup> (71.83), fruit yield (32.35 t ha<sup>-1</sup>). This was seconded by application of one time normal water fb two times treated sewage water (29.24 t ha<sup>-1</sup>). 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

### **43. 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 conducted at 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 Karnataka during kharif season of 2018. The experiment was laid out in Randomized Complete Block Design consisting of twelve treatment combinations and replicated thrice having three levels of humic acid and graded levels fertilizers viz., 75% RDF (T1), 100% RDF (CHECK, T2), 125% RDF (T3), T1+ humic acid @ 2.5 kg ha<sup>-1</sup> (T4), T1+ humic acid @ 5 kg ha<sup>-1</sup> (T5), T1+ humic acid @ 7.5 kg ha<sup>-1</sup> (T6), T2+ humic acid @ 2.5 kg ha<sup>-1</sup> (T7), T2+ humic acid @ 5 kg ha<sup>-1</sup> (T8), T2+ humic acid @ 7.5 kg ha<sup>-1</sup> (T9), T3+ humic acid @ 2.5 kg ha<sup>-1</sup> (T10), T3+ humic acid @ 5 kg ha<sup>-1</sup> (T11), T3 + humic acid @ 7.5 kg ha<sup>-1</sup> (T12).

The results revealed that application of 125 per cent RDF + humic acid at 7.5 kg ha<sup>-1</sup> produced significantly higher grain and straw yield (5480 and 6452 kg ha<sup>-1</sup>, respectively) as compared to recommended dose of fertilizers alone (4508 and 5506 kg ha<sup>-1</sup>, 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<sup>-1</sup>) 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<sup>-1</sup>, respectively) with higher net returns (Rs.61.434 ha<sup>-1</sup>) and benefit cost ratio (2.25) followed by 100 per cent RDF + humic acid at 7.5 kg ha<sup>-1</sup>.

August, 2019

(K. V. Sudhir Kamath)

Major Advisor

#### **44. 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<sup>-1</sup>) 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<sup>-1</sup>), number of filled grains per panicle (128) and total nutrient uptake of NPK (110.81, 48.47 and 61.55 kg ha<sup>-1</sup>, respectively) as compared to recommended dose of fertilizers alone (4952 and 6293 kg ha<sup>-1</sup>, respectively).

Significantly higher grain and straw yield (5843 and 7477 kg ha<sup>-1</sup>, 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<sup>-1</sup>) and benefit cost ratio (2.11) followed by 100% RDF + Glyricidia + PGPR (T6) over other treatment combinations.

August, 2019

(M. Hanumanthappa)

Major Advisor



## **45. 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 (*Eleusine coracana* 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 fortnight recorded significantly taller plants (96.48 cm), leaf area (904.57 cm<sup>2</sup> plant<sup>-1</sup>), total dry matter accumulation (31.27 g plant<sup>-1</sup>), 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<sup>-1</sup>), and straw yield (5754 kg ha<sup>-1</sup>). Among the varieties, KMR-301 recorded significantly taller plants (94.17 cm), leaf area (760.85 cm<sup>2</sup> plant<sup>-1</sup>), total dry matter accumulation (26.48g plant<sup>-1</sup>), 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 kg ha<sup>-1</sup>), and straw yield (4860 kg ha<sup>-1</sup>). Hence, for achieving higher yield in finger millet the best sowing date found to be July 2<sup>nd</sup> fortnight for KMR-301 variety.

August, 2019

(Sunil C)

Major Advisor

## 46. 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 *Echinochloa crusgalli*, *Echinochloa colonum*, *Digitaria sanguinalis*, Sedges like *Cyperus rotundus*, *Cyperus iria*, and broad leaf weeds like *Digera arvensis*, *Physalis minima*. The experimental results revealed that Inter 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<sup>-1</sup>), straw yield (5928 kg ha<sup>-1</sup>) and major nutrients uptake by crop also recorded in above mentioned treatment. These results are on par with inter-cultivation at 20 DAS fb bispyribac sodium 10 % SC @ 20 g a.i ha<sup>-1</sup>. Among herbicide combination treatments, pendimethalin 38.7 CS @ 0.75 kg a.i ha<sup>-1</sup> (Pre. em.) fb bispyribac sodium 10% SC @ 20 g a.i ha<sup>-1</sup> (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 kg a.i ha<sup>-1</sup> with safener (Pre. em.) fb inter-cultivation at 40 DAS. There was no residual effect of herbicides on soil microbial population and succeeding crop.

September, 2019

(Kumara, O.)

Major Advisor