

## **New Technologies Developed for Inclusion in Package of Practices during 2019-20**

### **Crop Improvement (1)**

#### **Seed Science and technology (1)**

1. **Fungicidal seed treatment in Finger millet to manage nursery blast disease:** Seeds treatment with Tricyclazole 75%WP @ 3.0 g/kg or Tebuconazole 50% + Trifloxystrobin 25% WG @ 1.0 g/kg can be used for the control of nursery blast in finger millet crop, since the fungicide Carbendazim recommended in package of practices of UAS, Bangalore is not available in the market.

### **Crop production (8)**

#### **Agronomy ( 7)**

1. **Potassium management in little millet :**Application of 20 kg ha<sup>-1</sup> potassium in little millet increased the grain by 17.85 % and straw yield by 13.72 % of little millet with net return of Rs.22729/- per hectare and B:C ratio of 2.01
2. **Potassium management in Foxtail millet :**Application of 20 kg ha<sup>-1</sup> potassium in foxtail millet increased the grain by 15 % and straw yield by 10.3 % of foxtail millet with net return of Rs. 30495 /- per hectare and B:C ratio of 2.33.
3. **Weed Management in Transplanted finger millet:** Application of bensulfuron methyl + pretilachlor 6.6 %G @ 1.20 kg per acre in 300 liters of water on the day of planting or within three days of planting effectively controls the weeds with higher B:C ratio of 2.56.
4. **Intercropping in Maize:** Intercropping of 2 rows of greengram / blackgram in between 45/75 cm spaced paired row of maize resulted in improvement in maize equivalent yield (18%), net returns (Rs. 62,000/ha) and B:C ratio (1.95) in addition to improvement in soil fertility.
5. **Alternate wetting and drying method of water management for enhancing water use efficiency in transplanted paddy:** alternate wetting and drying method of water management viz., 5 cm irrigation at 3 days after disappearance of ponded water up to panicle initiation (PI) and 3 ± 2 cm standing water after PI recorded average 6.0 to 11.0 % higher paddy grain yield and 37% water saving as compared to flooding throughout crop growth (3 ± 2cm). Further, lower total water used for irrigation (1165 mm) and higher water use efficiency (4.92 kg/ha-mm) were recorded with alternate wetting and drying method of water management as compared to flooding throughout crop growth (1852 mm and 2.90 kg/ha-mm, respectively) or saturation maintenance up to PI (1395 mm and 4.18 kg/ha-mm, respectively) .
6. **Hydroponic fodder maize and cowpea production system-**Fodder maize seeds sown @ 2.5 Kg/Sq. ft. in hydroponic system yielded 4 to 7 Kgs green fodder/Kg of seed at 10<sup>th</sup> to 14<sup>th</sup> days after sowing. Fodder cowpea seeds sown @ 2.5Kg/Sq. ft. in hydroponic system yielded 5.0 to 5.5 Kgs green fodder/Kg of seed at 11<sup>th</sup> to 13<sup>th</sup> days after sowing.

- 7. Agase(*Sesbania grandiflora*) based intercropping system:** Intercropping of Bajra Napier hybrid in agase in 2:1 ratio recorded higher green forage yield (602q/ha), net returns of Rs.52975/ha and B:C ratio 2.23. For inclusion in the supplementary book of POP

### Soil Science & Agril. Chemistry (1)

- 1. Use of Diatomaceous earth for increased yield in potato:** Application of diatomaceous earth @ 150 kg ha<sup>-1</sup> along with 25 t FYM ha<sup>-1</sup> and 50 % of recommended dose of fertilizer as per package of practice increases potato tuber yield (16.80 t ha<sup>-1</sup>) by 24.90 % and B:C ratio of 2.03.

### Crop Protection (7)

#### Entomology (3)

- 1. Chemical control of fall Army worm, *Spodoptera frugiperda* in maize-** Application of spinetoram 11.7 SC @ 0.5 ml/ chlorantraniliprole 18.5 SC @ 0.4 ml or emamectin benzoate 5 SG @ 0.4 grams per liter water.
- 2. Eco-friendly control of bruchid beetle in stored cowpea** – cowpea seed treated with Azadirachtin 10,000 ppm @ 7.5 ml /kg of cowpea seeds can prevent the bruchid attack in cowpea upto 12 months, maintaining the viability and vigor of seed .The seeds treated with Azadirachtin has no residual effect, enhances seed viability, safer to soil micro and macro fauna.
- 3. Management of rodents in groundnut system:** For management of rodents in groundnut apply 2% Zinc phosphide bait (@ one kg/ha) during germination stage followed by inserting one aluminium phosphide(12g) tablet in to the burrow (50 tablets/ha) during peg formation stage of the crop. **OR** Fix the snap trap @ 50 traps/ha continuously for 3 days during germination stage followed by application of 2% zinc phosphide bait (@1 kg/ha) during peg formation stage of the crop. (When the live burrow counts are more than 50/ha)  
(Note: For preparation of 1.0kg poison bait, add 450g rice, 450g ragi, 40g groundnut kernels, 40g groundnut oil and mix thorouly with 20g of zinc phosphide powder. Prepare 50 paper pockets containing 20g poison bait).

#### Plant Pathology (4)

- 1. Integrated Management of yellow mosaic virus in pole beans:**

**Before sowing:** sowing of 2 rows of African tall maize all-round the field 30 days before sowing the main crop, Mulching with black silver mulch, Soil application of *Pseudomonas fluorescens* along with neem cake (1kg/100kg neem cake).

**At the time of sowing:** Seed treatment with Thiomethaxam 25 WG – 5g/kg seeds and sowing,

**After sowing :** Installation of yellow sticky trap @ 10 no/acre & spraying of seaweed extract (1.5ml/L) 20 days after sowing, Spraying of Thiamethoxam 25% WG (0.5 g/L) and Imidacloprid 17.8 SL (0.5ml/L) 30 and 45 days after sowing respectively.

2. **Management of brown spot disease in Rice:** Spraying of fungicide Hexaconazole 5 SC @ 2ml /litre as soon as the symptoms are observed and if necessary at 15 days interval manage the brown spot disease of paddy by reducing the disease by 48.59% and increasing the yield by 29.93% with benefit cost ratio of 1.69.
3. **Management of blast disease in paddy using Tricyclazole 75WP +Sea weed extract LBD1 (0.4g+2ml/l):** Spraying of Tricyclazole 75WP+Sea weed extract LBD1 (0.4g+2ml/l) as soon as the blast symptoms are seen and if necessary at 15 days interval manage the blast disease of paddy with benefit cost ratio 1:1.41.
4. **Management of maize downy mildew:** Seed treatment with Mancozeb + Metalaxyl@3 g/kg of seed before sowing and foliar spray of Azoxystrobin + Difenconazole @ 1ml/l at 30 DAS

### **Agriculture Engineering (1)**

1. **Multipurpose mobile solar tunnel dryer for drying of silkworm pupae:** A multipurpose forced convection solar tunnel dryer of 60 kg capacity was developed and used for drying of silkworm pupae having size 6.5 x 1.8 x 1.1 m (L x W x H) with MS square tube frame structure and covered with 5 mm thickness toughened glass. The solar tunnel dryer consisted of a solar collector section and drying section. In drying section four trays with mesh bottom of size 1.2 x 0.9 x 0.08 m was used to facilitate the loading and unloading of the products. A closed thermo-pore was used as insulation material to reduce the heat loss from the dryer. In a solar tunnel dryer, the drying time taken was 6.5 to 9.0 hours to reduce the moisture content from 103.3 percent (dry basis) to attain safe moisture content of 8.72 percent (dry basis) but in case of open sun drying the drying time was 18-22 hours. The results showed that the drying rate of silkworm pupae under the solar tunnel dryer was found to be very high during the initial phase of drying due to higher moisture diffusion. Chemical analysis indicated that the quality parameters of solar tunnel dried silkworm pupae were superior compare to open sun dried silkworm pupae. The thermal efficiency of solar tunnel dryer for drying of silkworm pupae was found to be 35.36 per cent. The pupae samples dried in solar tunnel dryer were completely protected from insects, dogs, crows, monkeys, vultures, dust and also the quality was superior.