

BREAKTHROUGH RESEARCH

GENOME SEQUENCING OF CROPS/ PATHHOGENS/ INSECTS/ MICROBES

- **Whole genome sequencing of Finger millet varieties:ML-365 and PR 202**
- **Whole genome sequencing of Dolichos bean (*Lablab purpureus* L. Sweet)**
- **Fingermillet Associated Metagenome revealing the endophytes**
- **Whole genome Sequencing of *Indica* Rice for blast**
- **Whole Genome Sequencing of *Sarocladiumoryza* causing sheath rot disease of rice**
- **Genome wide comparison of Magnoportha species infections in Millets, Rice & Grass**
- **Whole genome sequencing of Yellow mite (*Polyphagotarsonemuslatus*)**
- **60 DNA sequences (COI–23 & ITS2–37) of eight mite species and two insect species were accessioned in NCBI-GenBank public database.**
- **DNA barcoding of Plant feeding mites in India (13 species)** BIN (BOLD Index Number) and DOI (Digital Object Identifier) have been provided to eight species of mites by BOLD (Barcode of Life Data system).

Spider mites (Tetranychidae)	8 species
False spider mites (Tenuipalpidae)	2 species
Coconut eriophyid mite (Eriophyidae)	1 species
Broad mites (Tarsonemidae)	2 species

Prepared AGROCLIMATIC ATLAS OF KARNATAKA

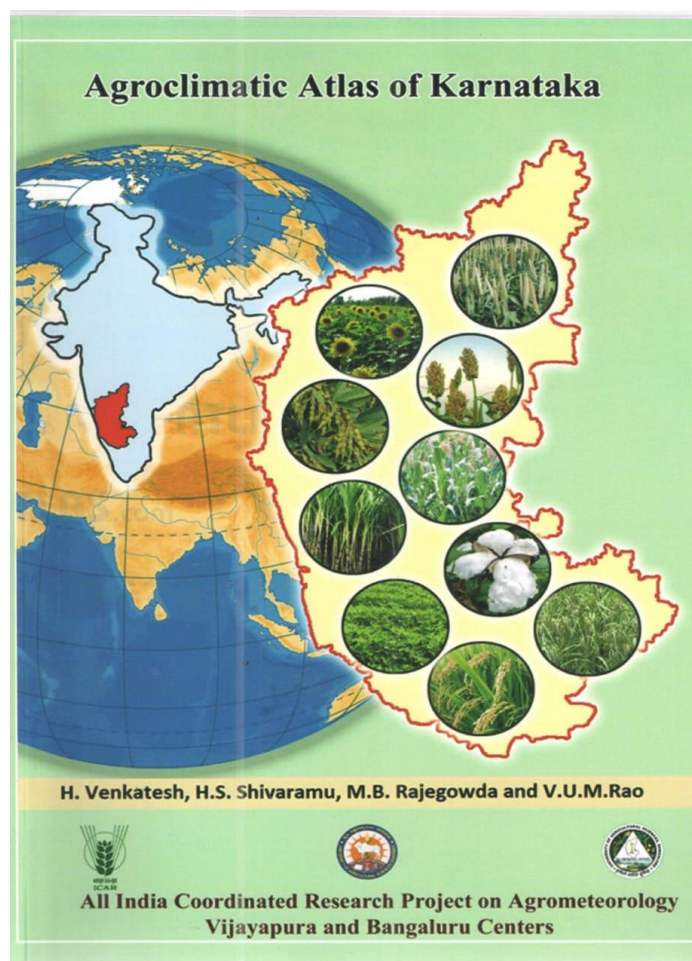


Fig.: Agroclimatic Atlas of Karnataka

REDEFINED THE DROUGHT DECLARATION CRITERIA

SLAG BASED GYPSUM AND ITS UTILIZATION IN AGRICULTURE: Application of 300-750 kg SBG ha⁻¹ significantly increased the yield of different crops over commercially available gypsum. The properties of the material make it to act as a soil conditioner besides increasing the nutrient uptake and nutrient use efficiency of paddy, maize and groundnut. The results of these field experiments are compiled and filed in the form of a patent “A SOIL CONDITIONER AND APPLICATIONS RELATED THERETO” (Indian Complete Patent Application No. 202131002666) along with the scientists of Tata Steel Limited, Jamshedpur.

- **ALTERNATE WETTING AND DRYING IRRIGATION IN TRANSPLANTED PADDY:** Alternate Wetting and Drying (AWD) irrigation (5 cm irrigation at 3 days after

disappearance of ponded water) up to panicle initiation (PI) and allowing 3 ± 2 cm standing water after panicle initiation can save water (Saves 37% total water used as compared to conventional irrigation), enhances water use efficiency (upto 70%) and reduces greenhouse gas emission by 25 per cent in transplanted paddy field.

Sugarcane Trash Management Using Microbial Consortium:

In India approximately 6.5 million tonnes of sugar cane trash are being produced every year, whereas 3-4 tonnes of trash produced per acre of sugarcane cane first crop and most of the residues are usually burnt in the field due to improper composting techniques. Besides the loss of organic matter and plant nutrients, burning of crop residues also causes atmospheric pollution due to the emission of toxic gasses methane carbon di-oxide that poses threat to human and ecosystem, In-situ composting of cane trash is a good alternate to mitigate these problem. Trash contains 28.6% organic carbon, 0.35 to 0.42% nitrogen, 0.04 to 0.15% phosphorus, 0.50 to 0.42% potassium. The sugarcane trash incorporation in the soil influences physical, chemical and biological properties of the soil. There is a reduction in soil EC, improvement in the water holding capacity, better soil aggregation and thereby improves porosity in the soil. Sugarcane trash incorporation reduces the bulk density of the soil and there is an increase in infiltration rate and decrease in penetration resistance. In addition to this, ratoon crop saves expenses on seeds, land preparation and transplantation. This saves about 30% of total expenses. After two treatments of trash with trash decomposing microbial consortium which also contains growth promoting substances where in it helps in complete decomposition of trash within 75-90 days and provides nutrients to ratoon crops which reduces dependency on chemical fertilizers there by higher yields can be realized.

Chemical Free Jaggery Preparation: The technology for preparation of chemical free/organic jaggery was developed at the Jaggery Park unit located at the Zonal Agricultural Research Station at Mandya. To disseminate the technology, 10 training programs (within the district, Inter-state and international Australian scientists and farmers) were organised and representatives from 300 jaggery units located in Mandya, Mysore, Chamrajanagara Districts and also from other states visited the centre. Two Startups were started during 2020.