Adhoc-Project: 2

Status of Dr. H. Venkatesh: Co-PI

Title: Crop growth and yield quantification through micro-meteorological modeling of field crops for risk assessment under dryland rainfed situation

Kharif Groundnut

- Based on the response of crop growth vis-à-vis meteorological factors, groundnut genotypes were segregated as – weather-sensitive and weather-insensitive. particularly with respect to pod growth. Pod growth in Cv. ICG-1930 was more dependent on the crop growth till the previous stage, than on meteorological variables – indicating its weather insensitivity. Cv. ICG-1930 was therefore identified as the least risky groundnut genotype to grow in the region.

- Considering the positive response of all genotypes to higher maximum temperature and higher relative humidity during the seedling and vegetative stage (0-45 DAS), it was inferred that sowing at the time of onset provides the best beginning for groundnut crop growth. Also, looking to the response of genotypes to maximum temperature, relative humidity range and temperature range, and their association with rainfall and cloudiness during pegging stage, the genotypes ICG-1930 and ICGS-11 were identified as highly suitable for drought tolerance. The results also showed that the prevailing warmer nights during reproductive stage helped the varieties ICG-1930 and ICGS-11 for yielding better.

Rabi Sorghum

- The results indicated that, in the grain filling stage earhead growth of varieties GRS -1 and 9-13 is dependent entirely on meteorological variables, and hence more susceptible to weather. On the other hand the M35-1 variety is dependent on earhead weight at previous stage, and hence is less susceptible to weather. Lower minimum temperature and greater relative humidity range during the grain filling stage were found favourable for higher grain yield in this variety. These two factors prevail in the second fortnight of December. Therefore Cv. M 35-1 was found to be least susceptible to this drop in temperature, and identified as a better genotype for the region.

Thus, the analysis could identify meteorological variables and their time of influence on the growth and yield of *kharif* groundnut and *rabi* sorghum crops. Based on this, the groundnut variety ICG-1930 and *rab*i sorghum genotype M35-1 were identified as the least responsive to meteorological variables, and therefore are to be considered as the genotypes to grow with minimum risk, for the climate of the region.