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## Editorial

### Research priorities and applications in agrometeorology

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With the introduction of Agro meteorological research activities somewhere in 1930 in the country, a tremendous progress both in research and its application to enhance farm production has been witnessed over the last few decades. Initially the program revolved around the climatic analysis that helped in delineating climatic zones and identifying the homogeneous crop growing regions across the country. Subsequently the Indian Council Of Agricultural Research (ICAR) realized the importance of this subject and started Agro meteorological research units simultaneously at CAZRI, Jodhpur and at IARI, New Delhi during 1960-70 and started conducting research programs related agro climate studies and crop weather relationships. Significant advances in the Crop Weather relationships and Energy flux transfers within the crop and the surrounding environment, Crop Simulation research programs, Remote sensing studies and advanced computing facilities around the globe and within the country felt the necessity to expand the research and teaching programs simultaneously both at ICAR Research institutes and in SAUs. Milestones in the history of agro meteorology are establishment of AICRP on Agrometeorology, creating computing facilities to generate medium range weather forecast, dissemination agro advisory services initially for 127 agro-ecological zones and establishment of Departments of Agrometeorology at all SAUs. Some of the applied agro-met research programs sponsored by GOI, DST and ICAR have brought out significant research results of practical utility in meeting the requirements of farming community. Application of Remote sensing, GIS, Computer and web based technologies; development Expert systems have revolutionized the concept of empowering the farmers with appropriate information to stabilize agricultural production. Agro-meteorologists working in various organizations over the past few decades have done commendable research work that had brought good recognition to this subject equally with any other discipline in agriculture.

Though excellent research output has come out in the discipline of agro-meteorology, however, the following research priorities and its application will help in further strengthening the ongoing activities of Agro-meteorological research programs in the country.

- Agro-climatic zone wise crop suitability classification based on FAO methodology may be carried out and evaluate it with the existing cropping pattern in terms of resources conservation and economic viability.
- District wise identification of climatic constraints along with soil, water and social aspects and suggest methods to improve sub-district level crop planning.
- Special focus on high rainfall and hilly regions on the above research programs need to be pursued vigorously to improve productivity from these areas.
- From the large data base on crop and climate collected over the years at different research institutes, compute the weather thresholds at different crop stages for various crops and quantify the impact of weather parameters deviations with duration.
- Develop methodologies to estimate pre-season crop production levels for different agro-climatic regions
- Crop wise Agricultural drought criteria may be developed based on soil variability and water stress tolerance at different crop growth stages.
- Crop-Weather relationships on Horticultural and Plantation crops, Vegetables grown under field and under roof gardens in urban areas, Floriculture under poly houses may be initiated

- Intensify micro-met studies along with pests/disease observations in the crop fields and develop thumb rules and operational models in collaboration with concerned scientific group.
- Applicability of district wise Crop Contingency Plans on near real time basis need to be evaluated using crop simulation models for its wider adaptability
- Expert Systems developed for better crop management strategies need to be evaluated under field conditions before its release on commercial scale
- Agro climatic region wise crop production strategies, water resources planning under different scenarios of projected climate change may be worked out on priority.
- Extensive use of Remote sensing data on crop conditions for preparation agro-advisories need to be encouraged
- Information needs of farmers associated in farming activities around urban and semi-urban regions, rural areas, deserts, hilly and in islands regions, farmers of dairy, poultry and aquaculture farming have to be identified and agro-advisories be prepared accordingly.
- Manuals on standard procedures for agro-climatic analysis, placement of instruments for measurements of micro-met observations and periodicity of observations may be prepared.
- Farmer user friendly smart phone based apps for empowering farmers in day to day crop management advisories may be developed.
- Bio-meteorological aspects of livestock, poultry and fisheries may be initiated in collaboration with the scientists of these disciplines
- Collaborative research programs with International, National and Private Organizations may be strengthened to meet the climate challenges and to enhance the matches between crops and environments. The collaborative research programs should include studies focused on the concept of ecological niche and the ways in which agriculture might benefit from use of appropriate organisms-environment interactions, including opportunities offered by genetic and agrometeorological interventions.