Recent Advances in micro-irrigation and fertigation for enhancing water and crop productivity under open and protected environment

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Department of Soil Science, COA, CSKHPKV Palampur -176062(HP)

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Irrigation systems are selected based on their water use efficiency, which varies with the soil properties and crop characteristics rather than the application system itself. Sprinkler and drip systems have substantially high irrigation efficiencies (60–70% and 80–90%, respectively) than that of traditional surface flooding (45–60% efficiency). Flood irrigation techniques utilize more water compared to low-volume, pressurized irrigation systems. During flood irrigation, the applied water percolates through the plant root zone, resulting in losses of applied nutrients by leaching. On the other hand, low-volume irrigation systems apply water only to the rhizosphere, therefore, agrichemicals can be more effectively applied with such systems. Because the infiltrating water dispenses the fertilizer in the soil, fertilizer distribution depends on the water flow pattern in the particular soil. Under flood irrigation, most of the water movement is due to gravity, resulting in excessive drainage. More nutrients may be needed for flood-irrigated fields than those irrigated with low-volume systems, which retain the applied water, and hence the nutrients, in the plant root zone.


Drip fertigation reduces the wastage of water and chemical fertilizers, subsequently optimizes the nutrient use by applying them at critical stages, proper place and time, which finally increases water and nutrient use efficiency. Moreover, it is well recognized as the most effective and convenient means of maintaining optimal nutrient levels and water supply according to specific needs of each crop at specific crop development stage and according to type of soil.

Protected cultivation offers several advantages to produce vegetables of high quality and yields, by using the land and other resources more efficiently. This becomes more relevant to small and marginal growers who have small land holding are interested in a technology, which helps them to produce more crops each year from their land, particularly during off-season when prices are higher. Moreover, drip fertigation is the only recommended technology to be used under protected conditions.


Objectives

The objectives of this training programme are:

- To provide advance training to the scientists of ICAR/SAUs/KVKs and improve their skills in the area of micro irrigation and fertigation techniques
- To show the trainees live demonstrations /experiments on drip irrigation systems and fertigation technologies
- To provide an opportunity to discuss and exchange ideas/knowledge sharing between the academies and with the experts/resource persons who have made notable contributions in this area.

Course Content

The course content will broadly cover the following topics:

- Estimation of micro irrigation based water requirements using soil, plant and atmospheric continuum approach
- Micro irrigation and profile water distribution pattern as affected by soil texture and structure
- Estimation of crop water requirements and micro irrigation based irrigation scheduling under varied climate
- Fertigation scheduling for different crops in open and protected environment based on plant tissue analysis and site specific nutrient analysis approach
- Plant growth behavior as affected by micro irrigation and fertigation scheduling under open and protected environment
- Recent advances in farm machinery and irrigation systems in hills and plains
- Prescription based fertigation schedule for enhancing water and nutrient use efficiency
- Adaptability and suitability of micro irrigation systems and fertigation under organic and zero budget farming systems under rainfed areas
- Economic feasibility and success of micro irrigation systems and fertigation under canal command areas and watershed approach
- Scope of micro irrigation and fertigation systems and open and protected conditions for profitability of agriculture sector in India

Faculty

The faculty for the course will consist of scientists / teachers who have experience in micro irrigation based fertigation studies

About CSKHPKV Palampur

Himachal Pradesh Krishi Vishvavidyalaya (now Chaudhary Sarwan Kumar Himachal Pradesh Krishi Vishvavidyalaya) was established on 1st November, 1978. It is ISO 9001:2008 certified institution. The University has been given the mandate for making provision for imparting education in agriculture and other allied branches of learning, furthering the advancement of learning and use of research and undertaking extension of such sciences, especially to the rural people of Himachal Pradesh. The University has four constituent colleges. The College of Agriculture has thirteen departments, Dr.G.C.Negi College of Veterinary & Animal Science has sixteen departments, the College of Home Science has five departments and the College of Basic Sciences has four departments. These colleges offer six Bachelor Degree programmes and the Dean, Post Graduate Studies offers 22 Masters Degree & 15 Doctoral Degree programmes.

The Directorate of Research coordinates research in the field of agriculture, veterinary and animal sciences, home science and basic sciences. It has been giving priority to the location specific, need based and problem oriented research with multidisciplinary approach at main campus Palampur, 3 Regional Research Stations and 10 Research Sub-stations (spread over in all districts of the State.

The Directorate of Extension Education shares the responsibility for planning, implementation and coordination of various extension education programmes of all the

departments of four constituent colleges and research stations in close collaboration with the State Departments of Agriculture, Animal Husbandry, Fisheries and other concerned departments and institutions. It conducts a large number of trainings for farmers, livestock keepers, farm ladies, rural youth, etc. at main campus and at its eight Krishi Vigyan Kendras.

About Palampur

Palampur is a beautiful hill station situated in the foothills of Dhauladhar mountain range. It is known for its tea gardens yielding tea with wonderful flavour. It is also famous for temple tourism since it is surrounded by Shiva temple Baijnath; Chamunda Devi, Brijashawari Mata, Jawala Ji temples, etc. The famous Maclodganj (Dharamshala) and S.Shoba Singh Art Gallery are located at a distance of 45 and 10 km, respectively. The mean maximum and minimum temperature, during October is around 25 and 15^{0}C, respectively. The participants are requested to carry light woolen clothing and umbrella please.

Eligibility of participants

This short course is meant for active researcher/ teachers having 2 years research experience in ICAR Institutes/ State AUs/CAU/ Agricultural faculty of AMU, BHU, Vishwa Bharti and Nagaland University in Soil Science/ Agricultural Engineering/ Agronomy/ Horticulture/ Vegetable Science etc in the cadre of Assistant Professor or equivalent and above. Also, the participant should have degree of Master in Agriculture with working knowledge of computers. A total of 25 candidates will be selected for this course. The selection of candidate will be made by screening committee as per available guidelines of ICAR.

How to Apply

The participants' should apply for the short course through the online Capacity building programme Vortal *www.cbp.icar.gov.in* or under the 'Quick links' – Capacity Building Programme at *www.icar.org.in*. After filling the online application the participant has to take the print out of the application/registration form and get it approved by the competent authority of the respective organization. Finally the scanned copy of the application has to be uploaded in the CBP portal. In case of any difficulty, feel free to contact the Course Director. The closing date for receipt of applications is *15th July 2017*. The selected candidates will be intimated through e-mail by *20th July 2017*. After the candidates are intimated of their selection, they should immediately reply with firm acceptance by *20th August 2017*.

Registration

There is no course fee, however a non-refundable registration fee of Rs.50/- (Rupees Fifty only) is to be paid by way of a Postal Order (drawn in favour of the Comptroller, CSKHPKV, Palampur) payable at Palampur.

TA, Boarding and Lodging

The boarding, lodging, TA and DA expenses of the selected participants will be met from ICAR fund as per norms and operational guidelines for organization of short

course. Participants will be paid to and fro fare for journey restricted to AC-III tier train fare or bus from the place of duty to the short course location and back by shortest route for encouraging maximum participation across the country. Actual TA will be paid on production of tickets by the participants. The participants will be provided shared accommodation in the any guest house of the University.

How to Reach

Palampur is well connected with other parts of the country through air, rail and road. The nearest airport is Dharamshala (*Gaggal*) which is about 40 km from Palampur. There are daily flights from Delhi depending upon weather. The nearest broad gauge railhead are Pathankot and Una which are about 120 and 150 km away from Palampur, respectively. A number of buses are available from Pathankot and Una. Another route to reach Palampur is by buses from ISBT Delhi; (Air conditioned); the buses are also available from the ISBT Delhi to Jogindernagar/ Baijnath – en-route Palampur.

IMPORTANT DATES

Last date for receipt of applications	:	15 July, 2017
Intimation to selected candidates	:	20 July , 2017
Confirmation by selected candidates	:	20 August, 2017

Address for correspondence

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