Department of Agricultural Engineering

Research
Technology released/ research recommendations(2012-2018)

Sr. No.	Project Title & role played	Year	Relevant output/outcome
1	Optimization of acid injection rate for anti-clogging of drip system (Co-PI)	2012 State	For acid treatment of drip irrigation system rate of acid injection rate,lph (I) and coefficient of acid injection (K) is recommended using the following equation: $I = KxR$ K=-28.314+4.368 * pH of irrigation water Where and R= Flow rate of system, lps
2	Maximization of *rabi* sorghum yield through drip irrigation (PI)n	2012 State	For higher yields, gross monetary returns, net monetary returns and B:C ratio of rabi sorghum, inline drip irrigation system with water application at 1.0 ETc is recommended for paired row planting at 45x15-75 cm.
3	Drip irrigation layout &fertigaion schedule for sweet orange (PI)	2013 State	For higher yields, gross and net monetary returns, and B:C ratio of sweet orange inline drip system forming a loop around the tree canopy along with application of 75% of recommended dose of fertilizers (600:300:300 g/plant NPK) in 12 splits till 240 days after stress withdrawal in *Mrugbahar* is recommended.
4	Drip irrigation and fertligation schedule for okra (PI)	2013 State	For higher yields, gross and net monetary returns, and B:C ratio of *Rabiokra* inline drip irrigation system laid at alternate row and scheduled at alternate day with depth of water equal to 40% pan evaporation along with 75% recommended dose of water soluble fertilizers at 75, 37.5 and 37.5 kg/ha NPK, respectively in 5, 3 and 5 splits from 0 to 75 days after sowing is recommended.
5	Drainage coefficient for Parbhani and Aurangabad (PI)	2014 State	Drainage coefficient developed for Parbhani and Aurangabad are recommended for design of drainage system design in these regions which can help in planning and execution of the drainage systems.

6	Acidification requirements for drip irrigation system as per water quality (Co-PI)	2014 State	For acid treatment of drip irrigation system rate of acid injection (I), lps and coefficient of acid injection is recommended for hydrochloric (K_1), sulfuric (K_2)and nitric acid (K_3) using the following equation: $$I = KxR$$ where R= Flow rate of system, lps K_1=-0.048 (0.0455*pH + 0.00047*TDS - 0.234) K_2=-0.0168 (0.0293*pH + 0.00045*TDS - 0.1455) K_3=-0.0372 (-0.06309*pH + 0.00018*TDS + 0.510)
7	Rainwater harvesting in farm pond and its utilization for protective irrigation using diesel pump and sprinkler system (Co-PI)	2014 (State)	For higher yield and economic benefits of kharif soybean and rabi safflower its is recommended to utilize harvested water in farm pond using 1.5 hp diesel pump and five nozzle sprinkler system for one protective irrigation.
8	Drainage coefficient for Jalna, Nanded and Hingoli (Co-PI)	2015 State	Drainage coefficient developed for Jalna, Nanded and Hingoliare recommended for design of surface drainage system design in these regions
9	Development of DCS Software for estimating drainage coefficient (PI)	2015 State	VNMKV developed DCS computer software is recommended for easy calculation of drainage coefficient based on rainfall analysis.
10	Effect of micro irrigation and management practices on Turmeric production (Project leader)	2015 State	For higher yields, economic benefit and water use efficiency planting of Turmeric at 45 x 15 cm on raised beds with top width 90 cm, base width 150 cm and alternate day drip irrigation at 0.5 PE is recommended.
11	Taluka-wise Drainage coefficient for Nanded, Hingoli, Latur& Aurangabad (PI)	2016 State	VNMKV developed Taluka-wsie drainage coefficient for Nanded, Hingoli, Latur& Aurangabad are recommended for design of surface drainage system design in these regions
12	Taluka-wise drainage coefficienct for Marathwada (PI)	2017 State	VNMKV developed Taluka-wsie drainage coefficient for all distrits of Marathwada and maps in GISare recommended for design of surface drainage system design in these regions.
13	Drip fertigation schedule for turmeric planted on raized bed (PI)	2017 State	It is recommended to schedule alternate day inline drip irrigation with 80% of cumulative pan evaporation for higher fresh rhizome yield and

			monetary benefits of turmeric planted on 1.5 m wide raised bed with paired row (45 x 15 cm). Similarly drip fertigationwith 160:80:80 N, P_2O_5, K_2O kg/ha with N in 5 equal splits @17.5% at an interval of 30 days from 30 DAP to 150 DAP while sixth dose of N @12.5 % at 180 DAP and P_2O_5 and K_2O in 3 splits of 50%, 25% and 25 %, respectively at planting, 60 DAP and 120 DAP is recommended.
14	Drip fertigation schedule for rabibrinjal (PI)	2017 State	For higher fruit yield and net monetary returns of *rabi*brinjal, it is recommended to schedule inline drip irrigation at 80% of pan evaporation daily with fertigation of 80:40:40 kg/ha of N: P: K; N in 5 equal splits at an interval of 30 days from transplanting to 120 DAP and P and K in three splits of 20, 10 and 10 kg/ha, respectively at planting, 30 DAP and 60 DAP.
15	Mulching and drip irrigation schedule for watermelon (PI)	2017 State	For higher yields and net monetary returns of watermelon, inline drip irrigation scheduled at 80%of pan evaporation daily with lateral laid at the centre of broad bed furrow of 90 cm top and crop is sown at 50 cm plant to plant spacing on the bed covered with black polythene mulch of 30 micron is recommended.
16	Mulching and drip irrigation schedule for groundnut under broad bed furrow planting.(PI)	2017 State	For higher yields and net monetary returns of summer groundnut, it is recommended to adopt inline drip lateral laid at the centre of broad bed furrow (BBF) having top width of 90 cm and three rows of groundnut planted at 30 cm covered by transparent or black polythene mulch and daily irrigation scheduled at 100% of pan evaporation on medium deep soils of Marathwada region.
17	Sprinkler irrigation schedule for chickpea (PI)	2017 State	In soybean-chickpea cropping system for higher yield and economic returns from chickpea it is recommended to apply two irrigations of 60mm depth first at flowering and second at pod formation stage through sprinkler irrigation.