B. RESEARCH :

University Agronomy Department is entrusted the responsibility for finalizing the technical programme of research to be carried out in Agronomy Discipline in the University.

1. RESEARCH RECOMMENDATIONS

The following crop production technologies and crop improvement programmes have emerged from this department as a result of extensive research.

1. Production Technology of Safflower and Mustard
2. Production Technology and testing of Groundnut genotypes during post monsoon season.
3. Production Technology of *kharif* and *rabi* maize.
4. Production Technology of Sunhemp.
5. Management of intercrops in Sugarcane
6. Irrigation and fertilizer requirement of sugarcane based cropping system.
7. Released safflower variety PBNS-12 under AICORP Safflower.
8. Application of fly ash in agronomic crops.
9. Development of TPS for commercial potato cultivation.
10. Production Technology of Bt. Cotton
11. Production technology for sugarcane
12. Rainfed and irrigated integrated farming systems

Recent Research Recommendation on crop production, weed management, water management and other technologies

2022

- It is recommended to apply the 75% RDF + FYM 5 t/ha to obtain highest rice grain yield and monetary returns and to obtain higher rice equivalent yield and monetary returns it is recommended to follow rice + soybean (3:2 in replacement series) intercropping system for Marathwada region.
- To obtain higher fodder yield and monetary returns from *kharif*forage sorghum, the application of fertilizer dose 100:50:50 NPK kg ha-1 (50:50:50 N:P:K Kg ha-1) as basal dose and 50 N kg ha-1 30 DAS) is recommended for Martathwada region.

- Soybean + pigeonpea (4:2) and Cotton + Soybean (1:1) biannual cropping systems in rotation is recommended for rainfed area of Marathwada region to obtain higer seed/grain yield. The conventional tillage with RDF (50%) + FYM (@ ton/ha) is also recommended for Soybean + pigeonpea (4:2) intercropping system for obtaining higher yield as well as to improve the soil health and organic carbon.
- Complete mechanization or partial mechanization along with Board bed and furrow (BBF) method of sowing for sobean-safflower sequence cropping is recommended for obtaining higher seed yield, monetary returns and proper rainwater conservation.
- Sowing of pigeonpea at crop geometry of 60-120 cm x 20 cm or 90 cm x 20 cm with foliar application of Brassinosteroids @ 0.1 ppmOR NAA @ 40 ppm, at bud initiation and flowering stage of pigeonpea is recommended forhiger seed yield along maximum economic returns.
- For higher bulb yield and net monetary return of summer onion in Marathwada region, it is recommended to schedule alternate day drip irrigation at 60% crop evapo-transpiration though inline lateral laid at the centre of raised bed having six rows of onion planted at the spacing of 15 x 7.5 cm and drip fertigation of 80:40:40 N, P_2O_5, K_2O kg ha-1 with N and K_2O in 10 equal splits @ 8kg and 4kg respectively and P_2O_5 in 5 equal splits @ 8 kg ha-1 at an interval of 7 days from transplanting to 70 days after transplanting.

2021

- Post emergence application of Fluazifop-p-butyl 11.1% + Fomesafen11.1% @ 250 g a.i./ha 20 to 25 days after sowing or Pre emergence application of Dicolosulam 84% @ 26 g a.i./ha & 1 Hoeing 20 to 25 days after sowing is recommended for effective weed control and higher net returns in soybean.
- In Marathwada region for higher yield, net monetary return and water use efficiency of summer okra, it is recommended to schedule alternate day drip irrigation at 80% of crop evapotranspiration through inline lateral laid at the center of raised bed having top width of 90 cm and two rows of okra sown at the spacing of 60cm x 30 cm and covered by 30 micron silver black polythene mulch.

2020

- For obtaining higher yield and net profit, planting of pigeon pea on Broad Bed Furrows (BBF) at 1.5m with two row on the bed at 90 cm along with foliar application of Mepiquat chloride @100 ppm at 50% flowering and integrated nutrient management with 5 tonnes of FYM ha^{-1}, seed

treatment of each Rhizobium and PSB@100ml/10 kg of seed along with 50% RDF (12.5 : 25: 12.5 NPK kg/ha) is recommended for Marathwada region.

- For maximizing productivity and net monetary returns, sowing of chickpea either on ridges and furrows or broad bed furrows (BBF) along with protective irrigations (60 mm depth) at branching and pod development stage are recommended.

2019

- For Maximizing the Pearl millet yield under late sown situations, sowing of pearl millet on 25th July + 5 days application FYM@ 5.0 t/ha + RDF (60:30:30 NPK kg/ha) + NPK foliar spray (19:19:19 Grade) @ 0.5% (50g / 10 lit of water) at 20-25 days after sowing is recommended for Marathwada region.
- The scheduling of irrigation at 75 mm CPE (February) 15 days, March 10 days, April 7 days interval) through flood irrigation method is recommended for getting maximum yield and monetary return for summer pearl millet in Marathwada region.
- Foliar application of $FeSO_4$ @0.75% (75g/10 lit of water) at 25-30 days after swoing is recommended for higher yield and monetary return in *Kharif* pearl millet for Marathwada region.
- In pre seasonal Bt. Cotton, for lowest para wilt seedling population, highest seed cotton yield and economical benefits, sowing of crop after 20 may under flood irrigation and after 30 May under drip irrigation and after 30 May under drip irrigation (with reduction of temperature below 39°C) is recommended for Marathwada region.
- For highest seed cotton yield and higher economic returns of hirsutum cotton under high density planting system, de-topping at 75 days after sowing or 90 days after sowing or spraying of Mepiquate Chloride 5% AS @ 250 ppm (25 ml/10lit. water) at 75 days after sowing is recommended.
- For highest cotton equivalent yield, gross monetary returns, net monetary returns and weed control efficiency in cotton + sobean (1:1) intercropping system, pre-emergence application of Oxyflourfen 23.5% EC @ 0.1 kg/ha a.i. followed by hoeing at 6 weeks after sowing is recommended.
- Application of cetyl alcohol @ 20 mg/sq. m. at an interval of 10 days is recommended for control of water loss due to evaporation up to 50 per cent from farm pond.
- In medium to deep black cotton soils of Marathwada region to manage/minimize reddening of irrigated Bt. Cotton and to obtain higher seed cotton yield and net monetary returns per hectrare, it I recommended to apply RDF 125% through fertigation (100: 50: 50 NPK kg/ha) along with tow sprays of micronutrients grade – II mixture @ 0.5 % + potassium schoenite @ 1.0% at 55 and 70 DAS respectively or to apply 75:37.5 NPK kg/ha through soil application of 75:37.5:37.5 NPK kg/ha through fertigation.

2018

- In Kharif season, for getting higher seed yield and monetary returns, it is recommended to sow sunflower crop on ridges and furrow at 60cm x 30 cm spacing in vertisol of Marathwada region.
- Seed treatment of *Azotobactor* + PSB @ 25 g each/kg seed + in situ green manuring of sunhemp @ 50 kg seed/ha and its incorporation in soil after 45 DAS is recommended for soil enrichment and profitable organic cultivation of American cotton varieties.
- High density planting of American cotton varieties on raised bed (bottom width 90 cm and top width 75 cm) with application of 125% RDF(75:37.5:37.5 NPK kg/ha) + soil test based micronutrients is recommended for higher yield and profitable returns on medium soils of Marthwada under rainfed condition.
- For higher seed cotton yield and net monetary returns of rainfed Bt. cotton, it is recommended to plant rainfedBt cotton on broad bed furrow in medium to deep black soils with in-situ green manuring (at 50% flowering/ at 45 DAS) of sunhemp as a inter crop OR apply 5 t/ha of FYM with the application of 75% RDF(90:45:45 NPK Kg/ha) + two sprays of potassium nitrate (KNO_3) at 35 days (1.0%) and at 75 days (2.0%) after planting respectively OR two sprays of micronutrient mixture (grade-II) @ 0.5% each) at days and at 75 days after planting respectively.
- To cope with dry spells and to attain stable rainfedBt cotton yield it is recommended to apply two sprays of 19:19:19 @ 0.5% at 35 days and at 75 days after sowing respectively OR potassium nitrate (KNO_3) at 35 days @ 1.0%) and at 75 days after sowing @ 2.0%) respectively along with recommended dose of fertilizers (120:60:60 NPK kg/ha) in medium to deep black soils.
- For higher seed yield and net monetary return of soybean, it is recommended to undertake sowing of soybean on broad bed furrow in medium to deep black soils with the application of RDF (30:60:30 NPK Kg/ha) and during dry spell two sprays of potassium nitrate (KNO3) @ 1.0 & 2.0%) OR two sprays of 19:19:19 @ 0.5%) at 30-35 day and at 60-65 days after sowing respectively.
- Application of 50% recommended NPK + 3.5 t/ha safflower residues along with 2.5 t/ha FYM to soybean and application of 50% recommended NPK + 3 t/ha soybean residues along with 3 t/ha FYM to safflower is recommended for saving of 50% NPK requirement of both crops in soybean – safflower cropping system on vertisols of Marathwada.

Recommendation on Paired Row Planting and PGRs In Pigeon pea

2. NATP/AD-HOC RESEARCH SCHEMES:

Following NATP/Ad-hoc Research Schemes were completed in the Department of Agronomy.

Sr. No.	Project	Scientist and Designation
1	Crop residue management	Dr. M.V. Dhoble Associate Dean and Principal, College of Agriculture, M.A.U., Parbhani Dr. S. J. Quadri, Associate Professor
2	NATP (ROPS-11) on Oilseed Based Cropping System	Dr. A. S. Karle, CCPI, NATP(ROPS-11) and Assistant Professor, M.A.U., Parbhani
3	NATP (PSR-21) on Sugarcane Intercropping System	Dr. V.M. Bhale, Co-Principal Investigator and Associate Professor
4	Summer Groundnut	Dr. S. G. Bhosle, Jr. Agronomist and Prof. K.S. Mulgir,Jr. Agronomist
5	Forage Crops	Dr. S.S Bainade, Assistant Professor
6	NWDPRA on watershed development	Dr. B.S. Ekshinge, Associate Professor
7	NWDPRA on Watershed development	Dr. G.T. Sugave, Assistant Professor
8	NATP (RNPS-14)	Dr. B.N. Chavan, Principal Investigator and Professor
9	TMC MM2.2	Dr. V.S. Shinde, Principal Investigator and Head
10	Ad-hoc Scheme on French bean	Prof. N.G. Lad, Principal Investigator and Associate Professor
11	TMC-MM2.1	Dr.D.N.Gokhale , Principal Investigator and Head Dept. of Agronomy

PRODUCT TESTING TRIALS (EXTERNALLY FUNDED) CONDUCTED AT DEPARTMENT OF AGRONOMY:

Sr. No.	Title of the Project	Grants (Rs. Lakh)	Funding Agency	Duration
1	Effect of Soil Application of Seaweed extract granules (0.1%) on growth nd yield of Bt Cotton	**1.70**	Agro Inputs Man. Association (of India), Pune	2013-14
2	Effect of foliar application of Protein Hydrolysate liquid(20%) on growth and yield of Bt cotton	**1.70**	Agro Inputs Man. Association (of India), Pune	2013-14

3	Effect of foliar and soil application of Humic acid(vim-95) on growth and yield of Bt cotton	**0.75**	VMAX CROPSCIENCE LTD. Rajkot, Gujrat	2013-14
4	Performance of PIH 485 85% WG against weed spectrum in soybean.	**2.70**	PI Industries Ltd, Gurgaon 122009 (Haryana)	2014-2015
5	Agronomic requirements of Cotton Hybrid SP-7517 BG II	**0.70**	Bayer Bio Science Pvt. Ltd., Aurangabad.	2014-2015
6	Bio-efficacy of Haloxyfop 10.8% EC against weeds in onion	**1.5**	Dow Agroscience India Pvt. Ltd. Aurangabad.	2014-15 and 2015-16
7	Phytotoxicity of Haloxyfop 10.8% EC on onion crop.	**0.4**	Dow Agroscience India Pvt. Ltd. Aurangabad.	2014-15 and 2015-16
8	Effect of Haloxyfop 10.8% EC on succeeding crops.	**1.5**	Dow Agroscience India Pvt. Ltd. Aurangabad.	2014-15 and 2015-16
9.	Performance of PIX 10042 76.75% against weed spectrum in soybean.	**4.27**	PI Industries Ltd Gurgaon 122009 (Haryana)	2019-2020 to 2021-22 ongoing
10.	Efficacy of nano Zn in soybean	**2.17**	Samata Gr. Pvt. Ltd.	2023

TRAININGS PROGRAMS ORGANIZED BY DEPARTMENT OF AGRONOMY		
Training Organized	**Sponsors**	**Period of training**
12 days training programme on "Integrated farming systems for doubling farmer's income" organized at VNMKV,Parbhani Course director: Dr. W.N.Narkhede Course co-ordinators: Dr. S.U.Pawar, Dr. Mirza IAB and Dr. Awasarmal V.B	ICAR, New Delhi	18 to 29 Nov., 2019.
Organized one day webinar on Rational use of herbicides and integrated weed management for farmers KVK staff, extension workers: through By Course director: Dr. B.V. Asewar Course convenors: Dr. S.U.Pawar	Department Of Agronomy and NAHEP, VNMKV, PBN.	24.06.2020.
Organized 13 lectures in webinar series on "Safe use of agrochemicals for sustainable environment" under NAHEP-CAAST-DFSRDA, VNMKV, Parbhani.by Dr. Megha.P.Jagtap, Nodal Officer (ESP)	Department of Agronomy and NAHEP-CAAST-DFSRDA, VNMKV, Parbhani	From 25th July, 2020 to 17 Sept 2020 every Saturday
Successfully organized International Seminar on **"**Digital Technologies for Smart Agriculture: A Futuristic Plan" from	Parbhani Chapter of ISA	10th to 13th August, 2020.
Dr. B.V.Asewar, Nodal officer, EAP organized National level online essay and debate competition at NAHEP Centre	Department of Agronomy and NAHEP, VNMKV	11/1/2021.
Three days online training programme on "Personality Development And Life Skills" under NAHEP-CAAST-DFSRDA, VNMKV, Parbhani. : Dr. B.V. Asewar, Nodal Officer (EAP)	Department of Agronomy and NAHEP, VNMKV	3-5 March 2021
Organized training programme on IWM and Efficient Use of Weedicides . Course director: Dr. B.V. Asewar Course convenors: Dr. S.U.Pawar and Dr. Mirza IAB	ICAR, New Delhi under ICAR Budget for development of Scheduled Caste students (SC-SP 2020-21).	23 to 25 March, 2021
Tutorial classes on Preparing for JRF/SRF/NET/ARS Exam and other	ICAR, New Delhi under ICAR Budget for	26 to 27 March,

Competitive Exams in Agriculture, Department of Agronomy, VNMKV, Pbn. Course director: Dr. B.V. Asewar Course convenors: Dr. S.U.Pawar Dr. Mirza IAB and Dr. V.B. Awasarmal	development of Scheduled Caste students(SC-SP 2020-21).	2021

Figure 1 Organization of ICAR short course on "Doubling the Farmers Income through Integrated Farming System for Livelihood Security" at AICRP on Dryland Agriculture, VNMKV, Parbhani - November 18-27, 2019

Figure 2 ICAR SPONSORED Integrated weed management and efficient use of weedicides UNDER SC-SP Plan

ICAR SPONSORED JRF/SRF/NET/ARS Exams and other competitive exams in Agriculture UNDER SC-SP Plan