ANNUAL REPORT
2019-20

RAJMATA VIJAYARAJE SCINDIA KRISHI VISHWA VIDYALAYA
RAJA PANCHAM SINGH MARG, GWALIOR-474002 (M.P.)

Mission

To impart education, conduct research and extension activities for enhancing productivity, optimization of profit, sustainability of agriculture and allied sectors and improving rural livelihood in the state of Madhya Pradesh.

Vision

To transform the Agricultural landscape of Madhya Pradesh by producing excellent dynamic and result oriented skilled human resource in modern Agriculture, thereby creating higher income, employment, gender equity, accessibility, sustainable production system and achieving social welfare for all.

Mandate

- *To serve as a centre of higher education in the field of agriculture and allied sciences.*
- *To conduct basic, strategic, applied and anticipatory research in the field of agriculture and allied sciences.*
- *To disseminate technologies to farmers, extension personnel and organizations engaged in agricultural development through various extension programmes.*
- *To produce and supply of genuine and quality seed/planting material to the farmers.*

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Patron : Prof. S. K. Rao
Vice-Chancellor
R.V.S.K.V.V., Gwalior (M.P.)

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Published by : Dean, Faculty of Agriculture
R.V.S.K.V.V., Gwalior (M.P.)

Correct Citation : RVSKVV Annual Report: 2018-19
Rajmata Vijayaraje Scindia Krishi Vishwa Vidyalaya,
Gwalior-474002 (M.P.)

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//FOREWORD//

It gives me an immense pleasure to present the Annual Report of the Rajmata Vijayaraje Scindia Krishi Vishwa Vidyalaya (RVSKVV) for the year 2019-20 to the end users. This report highlights the activities related to education, research and extension carried out by the University staff in the field of agricultural and allied sciences with a focus on enhancing livelihood status of the farming community. The University has developed credible technology in the field of agriculture and Horticulture. Farmers of the State are being benefited through its network of five colleges (four Agriculture and one Horticulture), five Zonal Agricultural Research Stations (ZARS), four Regional Agricultural Research Stations (RARS), six Special Research Stations (SRS), nineteen Krishi Vigyan Kendras (KVKs) and twenty-eight All India Coordinated Research Projects (AICRPs).

Rajmata Vijayaraje Scindia Krishi Vishwa Vidyalaya has grown into a diverse innovative institution of higher education, pursuing excellence in the fields of teaching, research and extension in agricultural sciences. Over the years, the University has sought to make a major contribution in improving the quality of human life in the region through its research-led initiatives in agriculture, environmental related issues and a host of other modern-day challenges including the production of quality seed and genuine planting material. The structure of its activities is rationalized, with emphasis on its distinguished strengths, management of education and development of quality man power and in this direction notable success has been achieved. In addition to the diverse activities related to agricultural sciences, RVSKVV has strong emphases on farmer's skills improvement and empowerment through the nineteen KVKs in the various districts. Teaching and learning quality has been steadily improving in recent years and a large number of capable man powers has been trained here.

In case of research programme, University finds a very special place in NARS through the coordinated projects in pulses, oil seeds, cotton, cereals, horticulture and natural recourses management. Exceptional research work on chickpea improvement, CMS based pigeon pea hybrid, efficient water management for boosting the productivity of other major crops like cotton, soybean, mustard, wheat, medicinal and aromatic plants are some of the noteworthy

contributions of the University. RVSKVV is also making sincere efforts to generate cutting edge technologies for enhancing crop productivity was done by the University. Thrust is also given on seed replacement in the state by producing quality seeds of important crops.

The Extension activities viz., trainings, demonstrations, field days, study tours, Kishan Mela, Krishi Goshtis and other farm advisory services were carried out to help the farming community of the region to solve their farm related problems. Biodiversity fair cum exhibition and awareness programme was one of the mega events which served as a platform for integration of farmers and Scientist on bio diversity conservation and display the biodiversity available in the M.P. and Chhattisgarh.

The students' performance in academic, sports and cultural events was impressive. The faculty of teaching, non-teaching and farm laborers joined their hands in fulfilling the mandate of the University.

I express my sincere gratitude to the Government of Madhya Pradesh, the ICAR and Government of India for their continued financial support. The contribution of the Members of the statutory bodies like the Board, the Academic Council and the Administrative Council in smooth functioning of the University has been praise worthy. The contribution of all the Deans, Directors, Heads, Registrar and Comptroller of the University in providing relevant information for the Annual Report is acknowledged.

Present Annual Report 2019-20, brought out by the University, covers the development and progress made in the areas of teaching, research & extension and seed production. It is my firm belief that this Annual Report will aptly serve as a show case of the activities of the University. It will be a good reference for administrators, policy makers, staff, students and even the farming community. I would like to thank all the contributors, members of the Editorial Board and Compilation Committee for compiling and editing this report in a comprehensive and presentable form.

(S.K. Rao)

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EXECUTIVE SUMMARY

Rajmata Vijayaraje Scindia Krishi Vishwa Vidyalaya, (RVSKVV) Gwalior (MP) was established on August 19, 2008. The University has been since then, catering to the multi farming needs of farming community Agriculture Development, ICAR and other stockholders. It is a new, but fast emerging promising University in the field of agriculture and allied sciences.

The mandate of the University is teaching, research and extension with a view to evolve appropriate solutions and technologies in the field of agriculture. It has a network of five colleges (four Agriculture and one Horticulture), five Zonal Agricultural Research Stations (ZARS), four Regional Agricultural Research Stations (RARS), six Special Research Stations (SRS), twenty one Krishi Vigyan Kendras (KVKs) and twenty-eight All India Coordinated Research Projects (AICRPs) spread across six agro-climatic zones in twenty-six districts of Madhya Pradesh. In addition to this, other ongoing projects/schemes *i.e*. non-plan, plan, tribal sub-plan and adhoc projects are also in operation.

During the year 2019-20, the University has undertaken a number of initiatives for the promotion of quality in its mandated areas. The major activities and achievements of the University are as follows:

TEACHING:

- The University offers two Under Graduate Courses *i.e*. B.Sc. (Hons.) Agriculture and B.Sc. (Hons.) Horticulture, 13 Post Graduate degree and 9 Ph.D. degree programmes in the different disciplines of Agriculture and Horticulture. The total intake capacity was 774 out of which, 364 were in undergraduate (UG), 356 in postgraduate (PG) and 54 in Ph.D. degree programme.
- During the year 2019-20, a total of 1370 boys and 726 girls' (Total Students-2096) students were on the roll of the University, out of which, 865 boys and 444 girls were in UG, 446 boys and 224 girls in PG, and 59 boys and 58 girls were in Ph.D. degree programmes.
- In Ph.D., 18 students submitted their thesis to the Director Instructions for evaluation. 190 students submitted Thesis for Post graduate degree program in Agriculture disciplines and 73 students for Horticulture degree programme.
- In Experiential Learning programme, 277 students of fourth year (B.Sc. Ag. and B.Sc. Hort.) have taken adequate hands-on experience on different aspects of Agriculture/Horticulture to cultivate capabilities suitable to the emerging job markets and build entrepreneurship spirit and business management competence in a way that they will be able to generate employment for themselves and for others.
- The modules of experiential learning programme namely Crop Production, Crop Protection, Horticulture, Nursery Production and Management, Protected cultivation of high value vegetable crops, Floriculture & Landscape Gardening, Mashroom Cultivation and Value addition in horticultural crops are running successfully.
- Under Rural Agriculture/Horticulture Work Experience 277 students of Fourth Year were placed in different villages of Research Stations/KVKs to learn and solve the practical problems of the farmers of adopted villages.
- 02 Students of the University qualified the JRF examination.

- 29 Students of the University received National Talent Scholarship (NTS).
- During the year, 594 students of the University have received State Government Scholarship, out of which 356 students belonged to OBC, 153 SC and 85 ST categories.
- Under NSS (National Service Scheme) programme, different activities like blood donation camp, Beti Bachao Abhiyan, Social Awareness Camp, Awareness about AIDS, Literacy, Pulse Polio Abhiyan, Mera Gaon Mera Gourav and Environment Day were organized. 17 students were awarded "B" Certificate and 01 student "C" Certificate examination of NSS.
- Under National Cadet Corps (NCC) programme, 60 Cadets passed "B" certificate examination and 28 cadets cleared "C" certificate examination.
- Through campus interviews, 33 students have been placed in jobs in leading private sectors, 40 students in Government/public sector and 03 self employed.
- Through different libraries of the constituent Colleges, 1, 36,566 books were procured and available to the students out of which 9239 books have been purchased during the reporting year. Apart from that, reports, thesis, CDs, 139 *e*-books, periodicals etc. are also available in the library of constituent Colleges of the University.
- In central library total 10341 printed books, 139 e-books, 07 printed magazines, 1303 gifted books, 15 priented journal and 52 E-magazines were available in Central library of VishwaVidhyalaya.
- 120 research papers were published in peer reviewed journals of national and international repute.

RESEARCH:

- Evaluation of different soybean based cropping sequences in *Vertisols:* Three crop sequences Soybean- Chickpea / Safflower/ Mustard, Maize-Chickpea/Safflower/Mustard and Black gram- Chickpea/Safflower/Mustard was grown under rainfed condition. Result showed that Hy. Maize (Done 1588) recorded highest seed yield (4545 kg/ha) followed by soybean (JS 20-34) and black gram (848 kg/ha). During *rabi*chickpea (RVG 202) produced higher seed yield 1667, 1625 and 1500 kg/ha grown after soybean, black gram and maize, respectively. Where as, the higher seed yield of safflower 800 kg/ha grown after black gram followed by 750 and 708 kg/ha recorded after maize and soybean. The data indicated that crop sequence Maize -Chickpea found more remunerative as recorded highest total return Rs.150900/- with B: C ratio of 4.31 followed by Maize – safflower (Rs.93400/- with B: C ratio of 3.67), soybean – chickpea (Rs.82605/- with B: C ratio of 3.36) and black gram – chickpea (Rs.80880/- with B: C ratio of 3.31). Whereas, lowest return Rs.51325/- with B: C ratio of 2.47 recorded by sequence soybean- safflower. Mustard not germinated due to poor moisture condition.
- The soil and ground water survey of dewas district was carried out by the centre using remote sensing techniques. On the basis of soil samples collected the salt affected area of the district was generated. About 88.5 % ground water samples belonged to good quality water and 9.8% samples fell in marginally saline water category. As far as salt affected soil is concerned, total 2702 hectare area in district was delineated as salt affected. Out of total salt affected area, slightly saline (361 hectares) was higher in Dewas tehsil followed by Moderate alkali (354 hectares) present in Tonkkhurd tehsil of the district. Water table fluctuation was recorded in 13 well samples situated in head reach of Indira Sagar Command (NSC) during the pre canal irrigation period (2005 and 2012) and post canal irrigation period (2015 and 2019). After commissioning of canal irrigation system in head reaches the average water table fluctuation were around 1.53 and 1.34 m during 2015 & 2019. The analysis of canal water quality showed that the waters are good for irrigation. The soil parameters of the area indicated that slight increase in pH, EC and organic carbon.Grain and straw yield of wheat was significantly influenced by various tillage systems and mulch during the experimentation. Among the tillage systems highest grain yield (3285 kg/ha) and straw yield (4827 kg/ha) was recorded in conventional tillage which was significantly superior to reduced tillage and zero tillage. Whereas grain yield did not influence significantly by the application of mulch.Application of rice crop residue as mulch @ 5 t/ha produced significantly higher straw yield (4761 kg/ha) in comparison to no mulch (4502 kg/ha). The data also showed that tillage and mulch had no significant on pHs, available N, P and K. However, significantly lowest value of ECe (1.39 dS/m) was recorded under conventional tillage followed by reduced tillage (1.47 dS/m) and lowest in zero tillage (1.73 dS/m). While, ECe did not affect by mulch.

- Long Term Manurial Trial in Vertisols:Based on the average of last 27 years, treatments T6 (FYM 6 t ha-1 + N20 P13) gave highest seed yield of 1905 kg ha-1 was found significantly superior with regards to seed productivity however, treatment T6 was found superior to rest of the treatments with regards to improvement in physical and chemical properties of the soil. The treatment T1i.e., control was found statistically inferior to all the treatments in respect of yield and fertility status. Organic matter decomposition has indicated the advantage of recycling organic matter and nutrients from farmyard manure. The organic matters contained in them influence the physical, chemical and biological properties of the soil. These studies clearly indicate that a part of the inorganics can be substituted, thus substantially cutting the cost of cultivation. These sources need to be tapped in future as alternatives for deriving nutrients and improving soil health.
- Monitoring of races/ strains of fusarium udaum through host plant differentials results revealed that differentials ICP-9174, ICP-8859, ICP-7035 showed registend reaction against fusarium udaum wilt of Pigeonpea in wilt sick plot renges from 6.39 (ICP-9174) to 92.88 % (ICP-2376) Results indicated that existence two variants (1 & 3) of fusarium udaum prevalent in the region
- Survey was conducted in the 28 villages of Nimar Zone and it is observed that incidence of wilt was low with medium duration varieties like JKM-189, ASHA, TJT-501 (Medium early) and other varieties of private sector whether grown as sole crop or in cropped with Soybean, Cotton, Mungbean, Maize etc. On the Contrary higher wilt incidence were observed with local cultures in sole crop as well as in intercrop. However it is relevant to mention here that this year (2018-19) received the rainfall of 634 mm which is below average.
- Evaluation of ICAR-ICRISAT Pigeonpea wilt and sterility Mosaic Disease Nursery entries results revealed that out of 40 entries 15 entries were reported resistant (below 10%) against fusarium udum in wilt sick plot, wilt ranges from 2.65 % to 93.03 % .In susceptible check ICP2376 wilt incidence was 93.03 % and LSI was 15.56 %.
- The percent pod damage by pod borer inPigeonpea started in 35 SMW (0.1%) and pod fly in 36 SMW (0.2%) which was their normal appearance of time for Nimar zone. The pest infestation was increased gradually as the time passed and reached its peak (34.3%) for pod borer and (40.6%) for pod fly in 51 SMW.

SEED PRODUCTION:

- The University is producing breeder and nucleus seeds of several crops, which is has contribution significant in enhancing seed replacement and increasing productivity of crops.
- The seed production in the University is carried out in twenty seven seed production farms. The total farm area is 1210.85 ha., out of which 64.45 per cent (780.37 ha.) is under cultivation. Among the cultivated area, 13.39, 34.59 and 52.02 per cent are covered under irrigated, partially irrigated and rain fed farming, respectively.
- The university produced 9911.40 quintal seed of different crops. During Kharif 2019-20 total production of 3603.70 q. seed has been produced under different crops like – Soybean, Green gram, Black gram, Paddy, Cotton, pigeonpea and during Rabi 2019-20 a total of 6307.70 q. seed has been produced under of different Rabi crops like Wheat, Chickpea, Lentil, Mustard and Safflower etc.

EXTENSION ACTIVITIES:

- For the assessment of latest technologies generated by RVSKVV, other universities or ICAR institutes of ICAR, 375 On Farm Trials (OFTs) were conducted at farmers' field on various thematic areas related to crops, animals, machineries, post harvest management etc. that benefitted 5455 farmers.
- For the purpose of popularizing new technologies**,** Front Line Demonstrations (FLDs) were carried out on various crops in area of 1054.46 ha on the fields of 505 farmers. In addition to these demonstrations, 1895 FLDs on different enterprises like fisheries, live stock management, vermicompost, value addition, post harvest management, malnutrition, farm machinery etc. were also conducted.
- During the year 2019-20 total 1959 trainings were imparted, which benefited 52782 participants including farmers and farm women, rural youth, extension personnel and government officials.
- In order to create awareness among farmers of the region, 20570 extension activities were conducted by the KVKs including Farmers' fairs, Farmers meeting, Field days, Exhibitions, Special days celebration were organized which benefited 717876 farmers. Among live stock based activities 59 AHC and 3 AVC were organised.
- A total number of 90 Abstract, 28 Booklets, 06 Books, 30 Training Manuals, 387 Electronic Media Show (CD/VCD), Technical Bulletin 27 and 44 Research Papers in Journal were prepared by Krishi Vigyan Kendras. KVK Scientists also published 112 popular articles in various agriculture magazine and news papers.
- A total number of 134538 soil samples were analysed by different KVKs, State Govt. and 231457 soil health cards were prepared and distributed to farmers of the region.
- Under Kisan Mobile Advisory Services, 1519 messages related to new technologies were sent to 1043704 beneficiaries of 23395 villages.
- '*Mera Gaon Mera Gaurav*' programme is being implemented by the Vishwa Vidyalaya through its five colleges and three Zonal Agricultural Research Stations. In this programme, the scientists regularly organizing Krishak Sangoshthies, Demonstrations and advising farmers abut recent agricultural technologies in the selected villages.

Srimant Rajmata Vijayaraje Scindia
(1919-2001)

1. INTRODUCTION

1. Mission:

- To impart education, conduct research and extension activities for enhancing productivity, optimization of profit, sustainability of agriculture and allied sectors and improving rural livelihood in the state of Madhya Pradesh.

2. Mandate:

- To serve as a centre of higher education in the field of agriculture and allied sciences.
- To conduct basic, strategic, applied and anticipatory research in the field of agriculture and allied sciences.
- To disseminate technologies to farmers, extension personnel and organizations engaged in agricultural development through various extension programmes.
- To produce and supply of genuine seed and planting material to the farmers.

3. Area of Jurisdiction:

RVSKVV, Gwalior is responsible for Agricultural Education, Research and Extension in following 26 revenue districts of the state:
Sheopur, Morena, Bhind, Gwalior, Shivpuri, Guna, Ashoknagar, Datia, Dewas, Shajapur, Agar Malwa, Ujjain, Indore, Dhar, Jhabua, Alirajpur, Ratlam, Mandsaur, Neemuch, Khargone, Badwani, Khandwa, Burhanpur, Bhopal, Sehore and Rajgarh.
The area under University jurisdiction is a part of the Deccan Plateau and comprises plateaus with mean elevation of 1600 feet above mean sea level; inter spread with the mountains of the Vindhya and Satpura ranges. The maximum height of 1350 m is recorded in Satpura range on the other hand 150 m height is found in Chambal Valley. The main river systems are the Betwa, Chambal, Narmada, Sindh and Tapti. Nearly one third of the state area is covered with tropical forest. The area contains three types of soils, varying from alluvial to medium and heavy black Vertisols with six agro climatic zones.

The geographical area of the state under the University jurisdiction is 137.16 lakh hectares out of this, 74.72 lakh hectares is under cultivation, 24.51 lakh hectares under Kharif and 36.45 lakh hectare under rabi fallow. Out of the total cultivated area,

49.42% is irrigated. However, the area under irrigation varies from as low as 18.85% in Jhabua district to as high as 75.63% in Datia district.

The economy of the area is primarily agriculture based. Nearly 75% population is engaged in agriculture. The Malwa region abounds in rich black cotton soil. The low lying areas of Gwalior and Bundelkhand have light soils, whereas the Narmada Valley is formed by deep rich alluvial deposits.

4. Climatic Conditions:

The overall climate varies from semiarid to sub humid with hot summer; cool and dry winter with an average annual rainfall ranging from 600 to1000 mm. Mean annual rainfall is 1029.21mm.

In general, aberrant monsoon behavior is a common feature in the region that usually creates abnormal weather conditions including long dry spells of 8-20 days duration in the middle of the season.

5. Agro Climatic Zones

Out of 11 agro climatic zones of the state, following six are under the jurisdiction of RVSKVV, Gwalior:

- Gird Zone
- Malwa Plateau
- Nimar Valley
- Jhabua Hills
- Vindhya Plateau (Partial)
- Bundelkhand Zone (Partial)

6. Major Crops and Cropping Pattern

- The main food crops of the area are wheat, rice, mustard, lentil and millets. Important among commercial crops grown in the area are pulses, oil seeds and medicinal crops. The state is poised for a breakthrough in soybean cultivation.
- The area coverage of soybean, groundnut and cotton under the jurisdiction of the University is 69, 66 and 55 per cent, which contributes to about 68, 67 and 56 per cent in total production of these crops in the state respectively. Chickpea, pea, black gram and wheat contributes about 35, 24, 54 and 48 per cent of the total state production from an area of only 20, 05, 46 and 40 per cent, respectively. The productivity of these crops in the region is higher than the state average.
- Area under horticultural crops is showing an increasing trend under the University jurisdiction. Mandarin, sweet oranges and limes under assured irrigation and guava, ber, aonla and custard apple without irrigation in Gird region, orange, grape, chiku, mosambi and acid lime in Malwa plateau; banana, papaya, lime and chiku in Nimar valley and lime, ber, guava, aonla and custard apple in Jhabua hills bloom well. Vegetables like Tomato, Potato, Sweet potato, Brinjal, Okra, Cole crops (Cabbage, Cauliflower), Drumstick, Radish, Carrot, Cucurbits, Arbi, Beans and Leafy vegetables etc. are grown in large acrage. Among the spice crops, turmeric, corriander, ajwain, chillies, garlic, fenugreek and fennel have their own specialties in different agro-climatic zones. The area coverage under seasonal flowers is also showing an increasing trend.

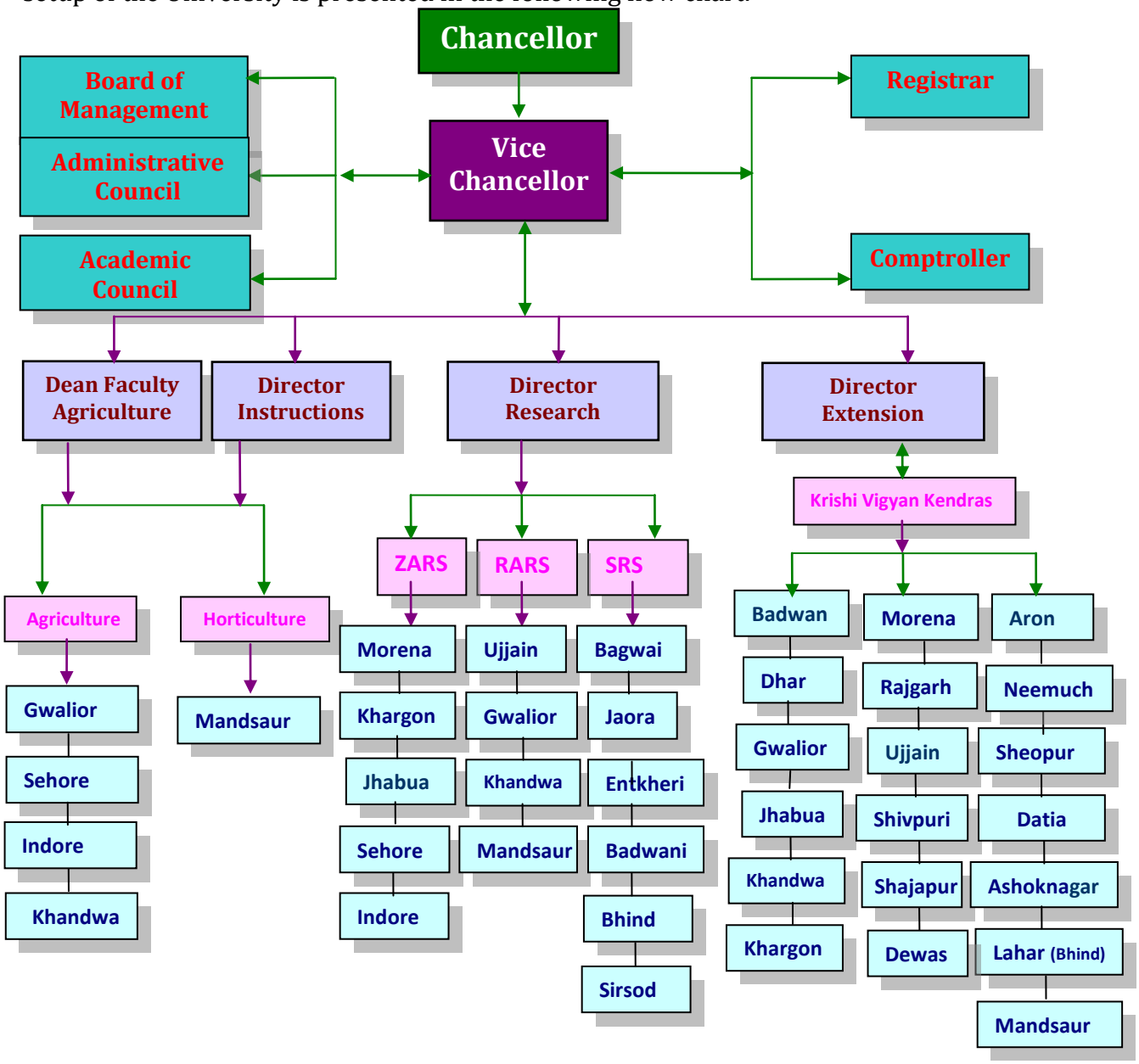
7. Organizational Setup:

Hon'ble Governor of Madhya Pradesh is the Chancellor of the University, and Vice-Chancellor is the Academic Head and Chief Executive of the University, who is supported by the following authorities:

- *Board of Management*
- *Academic Council*
- *Administrative Council*

The University comprises of Faculty of Agriculture headed by Faculty Dean. The constituent colleges are headed by respective Deans. Heads of the Departments are the key persons for teaching, research and extension of the respective discipline/department. Committee of Faculty of Agriculture and Extension Council are also constituted by Vishwa Vidyalaya.

Director Instructions, Director Research Services and Director Extension Services are responsible University authorities for human resource development, research activities and extension activities, respectively. Registrar and Comptroller support the Vice-Chancellor in administration and financial matters. The organizational setup of the University is presented in the following flow chart.



2. ACADEMIC HIGHLIGHTS:

Academic excellence is the backbone of every institute of higher learning. The responsibility increases many folds when the institute aspires for generating world class graduates with the competence to stand tall as a nation builder.

It is through the dissemination of latest technologies and changing knowledge from the global prospective to grass root level that the desirable development in the broad area of agriculture can be attained. The demanding trends in Agriculture/Horticulture need an increase in faculties in such fields and disciplines which have a tremendous market value so that the products of the University are not inclined to government jobs only but would be able to involve themselves in a variety of fields that can boost economy at the State and National level. Therefore resident instruction programme is carried out in the areas of Agriculture and Horticulture in four Agriculture colleges and one Horticulture College in the University.

2.1 Profile of the Colleges:

Rajmata Vijayaraje Scindia Krishi Vishwa Vidyalaya offers undergraduate, post graduate and Ph.D. programmes in the faculty of Agriculture. At present, the University has four Colleges of Agriculture and one college of Horticulture under the faculty of Agriculture. Four constituent Colleges of Agriculture are located at Gwalior, Indore, Sehore and Khandwa and one College of Horticulture is located at Mandsaur.

All these colleges offer Under Graduate and Masters Degree Programmes in different disciplines. Ph.D. programme is offered only at College of Agriculture, Gwalior.

The list of colleges with their location, year of establishment and degree programmes offered is given below.

RAJMATA VIJAYARAJE SCINDIA KRISHI VISHWA VIDYALAYA, GWALIOR (2008)

CoA, Gwalior (1950)

CoA, Sehore (1952)

CoA, Indore (1959)

CoA, Khandwa (1987)

CoH, Mandsaur (2002)

2.1.1 Details of the Colleges:

S. No.	Name of College with location	Year of Establishment	Degree Programme Offered
I	**Faculty of Agriculture**		
1.	**College of Agriculture, Gwalior**	1950	**(i) B.Sc. (Ag.)** **(ii) M.Sc. (Ag.)** (1) Agronomy (2) Entomology (3) Extension Education (4) Agriculture Economics & Farm Management (5) Plant Breeding and Genetics (6) Plant Pathology (7) Soil Science & Agricultural Chemistry (8) Environmental Science (9) Plant molecular biology & Biotechnology (10) Fruit Science (11) Vegetable Science **(iii) Ph.D.** (1) Agronomy (2) Entomology (3) Extension Education (4) Agriculture Economics & Farm Management (5) Plant Breeding and Genetics (6) Plant Pathology (7) Soil Science & Agricultural Chemistry (8) Fruit Science (9) Vegetable Science
2.	**RAK, College of Agriculture, Sehore**	1952	**(i) B.Sc. (Ag.)** **(ii) M.Sc. (Ag.)** (1) Agronomy (2) Entomology (3) Extension Education (4) Agriculture Economics & Farm Management (5) Plant Breeding and Genetics (6) Plant Pathology (7) Soil Science & Agricultural Chemistry (8) Vegetable Science
3.	**College of Agriculture, Indore**	1959	**(i) B.Sc. (Ag.)** **(ii) M.Sc. (Ag.)** (1) Agronomy (2) Entomology (3) Extension Education (4) Agriculture Economics & Farm Management (5) Plant Breeding and Genetics (6) Plant Pathology (7) Soil Science & Agricultural Chemistry (8) Vegetable Science
4.	**BM, College of Agriculture, Khandwa**	1987	**(i) B.Sc. (Ag.)** **(ii) M.Sc. (Ag.)** Plant Pathology
5.	**KNK, College of Horticulture, Mandsaur**	2002	**(i) B.Sc. (Hort.)** **(ii) M.Sc. (Hort.)** (1) Fruit Science (2) Vegetable Science (3) Plantation, Spices, Medicinal & Aromatic Crops (4) Floriculture & Landscape Architecture

Resident instruction programme is one of the mandates of the University *i.e.* impart education in Agriculture and Horticulture to produce graduates and post graduates ready to face the existing and new challenges in agriculture sector.

The University follows the semester system of education. Completion of a degree programme requires successful study of prescribed courses as approved by the Academic Council of the University. Course contents of all subjects are periodically updated and new courses are occasionally added to the degree requirement to cope up with the challenges of upcoming technologies. The University follows 10 point scale evaluation system approved by ICAR. Individual attention of each and every student is ensured through the advisory system. At Under graduate level, for a group of 5-10 students, one faculty advisor is appointed for each class and at Post-Graduate level, for each student, an advisory committee consisting of 3-4 faculty members is appointed. The teacher/ advisory guide, supervises and monitors the academic performance of his/her advises besides helping them in their personal problems. The advisor also maintains a close contact with parents/guardians of the students and informs them about the progress of their works/performance.

2.2 Admission Procedure

2.2.1 Undergraduate Programmes

Admission in first year of B.Sc. (Hons.) Agriculture/Horticulture is done on the basis of the merit list provided by the Professional Examination Board of the State Government, located at Bhopal. The board conducts a Pre-Agriculture Test (PAT) for B.Sc. (Hons.) Agriculture/Horticulture. The roster for reservation of seats for UG and PG as per provisions made by the State Government for different categories is strictly followed.

All possible efforts are made to fill up all seats of different categories by repeated counseling of the students.

2.2.2 Postgraduate Programmes

Admissions in post graduate programmes are made by the University through joint entrance examination basis. As per merit list, admissions are given to the students in the subject of their choice; subject to the availability of seats. The roster of reservation is also followed for these admissions.

2.2.3 Ph.D. Programmes

Similarly, in Ph.D. programme admission is made through joint entrance examination basis.

2.3 Allocation of Seats and Roster:

During the academic year 2019-20, the total intake capacity was 774 out of which 364 were in undergraduate (UG), 356 in postgraduate (PG) and 54 in Ph.D. degree programme. In the undergraduate level, out of 364 total seats, 308 seats were in B.Sc. (Ag.) and 56 in B.Sc. (Hort.) degree programme. In the post graduate level, out of 364 seats, 260 seats were in M.Sc. (Ag.) and 96 in M.Sc. (Hort.). Similarly, in Ph.D. programme, out of 54 total seats, 42 seats were in agriculture and 12 were in Horticulture discipline.

2.3.1 Intake Capacity (Degree wise):

S.No.	Faculty	Intake Capacity				Total
		Free seats	Payment seats	NRI	ICAR	
Degree Programmes						
1.	B.Sc. (Hons.) Agriculture	220	44	11	33	308
2.	B.Sc. (Hort.) Horticulture	40	08	02	06	56
	Total	**260**	**52**	**13**	**39**	**364**
1.	M.Sc. (Ag.)	260	-	-	-	260
2.	M.Sc. (Hort.)	96	-	-	-	96
	Total	**356**	**-**	**-**	**-**	**356**
1.	Ph.D. Agriculture	42	-	**-**	-	42
2.	Ph.D. Horticulture	12	-	**-**	-	12
	Total	**54**	**-**	**-**	**-**	**54**
	Grand Total	**670**	**52**	**13**	**39**	**774**

2.3.2 Under Graduate: B.Sc. (Ag. /Hort.)

(A) B.Sc. (Ag.)

Allocation of Seats		Boys	Girls	Total
Roster				
Free Seats	General	50	31	**81**
	ST	36	14	**50**
	SC	24	11	**35**
	OBC	44	13	**57**
Payment Seats		48	02	**50**
NRI Seats		-	-	**06**
Nominee/Fellow	ICAR	25	04	**29**
Total		**227**	**75**	**308**

(B.) B.Sc. (Hort.)

Allocation of Seats		Boys	Girls	Total
Roster				
Free Seats	Gen.	14	06	20
	ST	05	03	08
	SC	05	02	07
	OBC	03	02	05
Payment Seats		06	02	08
NRI Seats		-	-	02
Nominee/Fellow	ICAR	04	02	06
Total		**37**	**17**	**56**

2.3.3 Post Graduate: M.Sc. (Ag. /Hort.):

(A) M.Sc. Agriculture/Horticulture

S.No.	Subject	Gwalior	Indore	Sehore	Mandsaur	khandwa	Total
		PG	PG	PG	PG	PG	PG
1	Agronomy	12	12	12	-	-	36
2	Soil Sc. & Agri. Chemistry	12	12	12	-	-	36
3	Entomology	12	12	12	-	-	36
4	Genetics & Plant Breeding	12	12	12	-	-	36
5	Agri. Economics	8	8	8	-	-	24
6	Plant Pathology	12	12	12	-	8	44
7	Plant Bio Technology	08	-	-	-	-	8
8	Environmental Science	4	-	-	-	-	4
9	Extension Education	12	12	12	-	-	36
Total		**92**	**80**	**80**		**8**	**260**
(B) M.Sc. Horticulture							
1	Veg. Science	12	12	12	12	-	48
2	Fruit Science	12	-	-	12	-	24
3	Floriculture & Landscape Architecture	-	-	-	12	-	12
4	Plantation, Spice, Medicinal and Aromatic Crops	-	-	-	12	-	12
	Total	**24**	**12**	**12**	**48**	**-**	**96**

2.3.4 Ph.D. (Ag. /Hort.):

(A) Agriculture:

S.No.	Faculty	Intake Capacity				Total
		Free seats	Payment seats	NRI	ICAR	
1.	Ph.D. Agriculture	28	14	**-**	-	42

(B) Horticulture:

S.No.	Faculty	Intake Capacity				Total
		Free seats	Payment seats	NRI	ICAR	
1.	Ph.D. Horticulture	8	4	**-**	-	12

2.4 Students Strength:

2.4.1 Students Admitted:

S. No.	Degree Programme	No. of Students
1.	B.Sc. (Ag.)	296
2.	B.Sc. (Hort.)	48
Total		**344**
1.	M.Sc. (Ag.)	246
2.	M.Sc. (Hort.)	79
Total		**325**
1.	Ph.D. (Ag. /Hort.)	49
Total		**49**
Grand Total		**718**

2.4.2 **Students Strength at a Glance:** During the year 2019-20, total 1904 students were on the roll of the University, out of which 1330 in UG, 513 in PG and 61 in Ph.D. degree programmes.

S. No.	Degree Programme	No. of Students (2019-20)
1.	B.Sc. (Ag.)	1113
2.	B.Sc. (Hort.)	196
	Total	**1309**
1.	M.Sc. (Ag.)	537
2.	M.Sc. (Hort.)	133
	Total	**670**
1.	Ph.D. (Agri. /Hort.)	**117**
	G. Total	**2096**

2.4.3 Gender Wise Students Strength: During the year 2019-20, a total of 1370 boys and 726 girls' (Total Students-2096) students were on the roll of the University, out of which, 865 boys and 444 girls were in UG, 446 boys and 224 girls in PG, and 59 boys and 58 girls were in Ph.D. degree programmes.

2.5 Teaching Status:

Completion of a degree programme requires successful study of the courses as approved by the Academic Council. Every student has to study a set of prescribed courses per semester. The semester wise courses offered and total credits covered in different undergraduate and postgraduate degree programmes are given below:

2.5.1 Under Graduate: B.Sc. (Ag. /Hort.)

(A) B.Sc. (Ag.)

B.Sc. (Ag.)	Courses offered (No.)		Total Credits	
	I Sem.	II Sem.	I Sem.	II Sem.
I Year	8	9	20 (14+6)	22 (14+8)
II Year	10	9	26 (15+11)	23 (13+10)
III Year	8	9	20 (13+7)	18 (10+8)
VI Year	5*	6**	20 (0+20)	20 (6+14)
Total	**26**	**33**	**86 (42+45)**	**83 (43+40)**

RAWE/RHWE*, ELP**

(B) B.Sc. (Hort.)

B.Sc. (Hort.)	Courses offered (No.)		Total Credits	
	I Sem.	II Sem.	I Sem.	II Sem.
I Year	11	09	21(13+8)	21(12+9)
II Year	10	09	25(14+11)	23(13+10)
III Year	08	08	19(11+8)	20(12+8)
VI Year	02	02	20(5+15)	20(5+15)
Total	**31**	**28**	**85**(43+42)	**84**(42+42)

2.5.2 Post Graduate: M.Sc. (Ag. /Hort.):

S. No.	Subject/Department	Courses offered (No.)		Total Credits	
		I Sem.	II Sem.	I Sem.	II Sem.
1.	Agronomy	11	09	21 (16+5)	19 (13+6)
2.	Agricultural Economics & Farm Management	10	11	17 (13+4)	22 (14+8)
3.	Entomology	10	11	16 (9+7)	21(13+8)
4.	Extension Education	10	09	18 (12+6)	18 (12+6)
5.	Plant Breeding & Genetics	10	09	20 (13+7)	16 (10+6)
6.	Plant Pathology	11	10	21 (14+7)	19 (12+7)

7.	Soil Science & Agricultural Chemistry	10	09	21 (14+7)	19(13+6)
8.	Fruit Science	10	09	22 (15+7)	16 (10+6)
9.	Vegetable Science	10	09	22 (15+7)	17 (11+6)
10.	Plantation, Spices, Medicinal & Aromatic Crops	10	09	22 (15+7)	17 (11+6)
11.	Floriculture & Landscape Architecture	10	09	22 (15+7)	18 (12+6)

2.5.3 Ph. D. (Ag. /Hort.):

(A) Agriculture:

S. No.	Department	Course offered (No)		Total credits	
		I Sem	II Sem	I Sem	II Sem
1.	Agronomy	09	09	17(13+4)	14 (12+2)
2.	Agricultural Economics & FM	09	09	16 (11+5)	17 (11+6)
3.	Entomology	10	10	15 (11+4)	14 (10+4)
4.	Extension Education	09	09	16 (11+5)	18 (12+6)
5.	Plant Breeding & Genetics	09	09	12 (10+3)	16 (12+4)
6.	Plant Pathology	09	09	17 (11+6)	13 (10+3)
7.	Soil Science & Agricultural Chemistry	09	10	15 (12+3)	17 (14+3)

(B) Horticulture:

S. No.	Department	Course offered (No)		Total credits	
		I Sem	II Sem	I Sem	II Sem
1.	Fruit Science	09	08	17 (11+6)	13 (10+3)
2.	Vegetable Science	10	08	19 (12+7)	13 (10+3)

2.6 Experiential Learning Programme: As per the recommendations of Fifth Dean's Committee that the B.Sc. (Ag.)/B.Sc. (Hort.) graduates must have adequate hands on experience on different aspects of agriculture/horticulture. For this purpose, the experiential learning programme has been introduced in the final year that includes different aspects of horticulture and agriculture.

Modules of Experiential learning programme	Nos. of students
A. B.Sc. (Ag.)	
Module – I Crop Production	**226**
Seed Production Technology	
Remote Sensing, GIS & Land Use Planning	
Integrated Farming System	
Water Management	
Soil Management	
Management of Post Harvest Insect Pests & Diseases	
Module – II Crop Protection	
Integrated Pest & Disease Management	
Management of Post Harvest Insect Pests & Diseases	
Non Insect Pest Management	
Pesticides and Plant Protection Equipments	
Nursery Management of Horticultural Crops	
Integrated Farming System	
Module – III Horticulture	
Commercial Vegetable Production	
Commercial Floriculture	
Nursery Management of Horticultural Crops	
Processing & Value Addition of Horticultural Crops	
Integrated Pest & Disease Management	
Management of Post Harvest Insect Pests & Diseases	
Module IV	
Commercial Vegetable Production	
Nursery Management of Horticulture crops	
Protected cultivation of Horticultural crops and seed production of vegetable and flowers	
Processing and value addition of horticultural and crops	
Integrated Pest and Disease Management	
Mushroom cultivation	
Module V	
Nursery Production and management	
Module VI	
Protected cultivation of high value vegetable crops	
Module VII	
Floriculture & Landscape Gardening	
Module VIII	
Value addition in horticultural crops	
B. B.Sc. (Hort.)	
Module I	51
Nursery production and management	
Module II	
Protected Cultivation of High value horticultural crops	
Module III	
Floriculture and Landscape Gardening	
Module IV	
Post harvest technology and value addition	

GLIMPSES OF EXPERIENTIAL LEARNING PROGRAMME






Transplanting of annuals in poly beg

Planting of rose

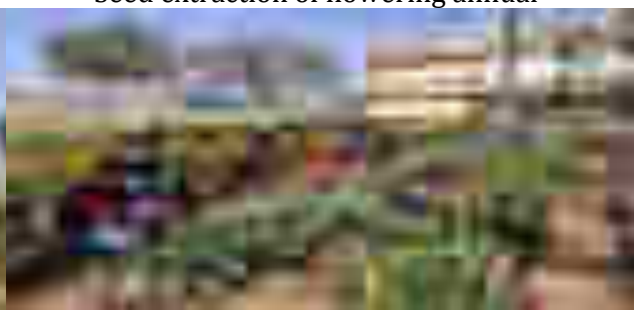
Management of ELP nursery

Planting of lawn grass

Development of vertical garden

Seed extraction of flowering annual

View of flowering annual field



Students activity in the field

View of flowering annual nursery

Marketing of flowering plants

ELP unit visited by Dean Sir

Floral gift prepared by ELP students

Preparation of Mixed Vegetable Pickles

Mixed Vegetable Pickles

Aonla Candy After Drying

Aonla Candy Ready For Sale

Pricking of Beal Fruit Halves For Preparation of Beal Candy

Beal Candy Ready For Marketing

Preparation of Guava Jelly

Guava Jelly Ready For Sale

Beal Preserve Ready For Sale

Beal Product Testing and Marketing

Preparation of Aonla Supari

Packing of Aonla Supari


Preparation of Media


Inoculation and preparation of pure culture


Preparation of Mushroom Spawn


Treatment of Wheat Straw


Spawining


Irrigation on mushroom begs

Harvesting of Button Mushroom


Cleaning of mushroom

2.7 Rural Agricultural/Horticultural Work Experience (RAWE/RHWE): As a part of regular curriculum, the final year students of B.Sc. (Ag.) and B.Sc. (Hort.) are placed in rural areas for one semester in selected villages through Krishi Vigyan Kendras (KVKs) working in the region, where each student is attached to one host farmer for practical training with regards to crop production, crop protection, economics and also dynamics of the rural society. Further, some social activities were also performed by the students like sanitation in the village, plantation in the premises of primary and middle schools.

RAWE/RHWE AT A GLANCE

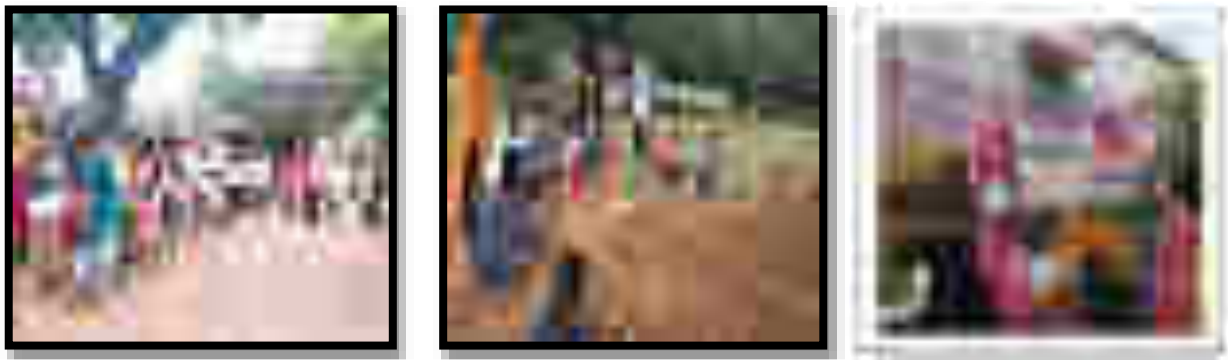
S.No.	Particular	Gwalior	Sehore
1.	**No. of student**	Boys 29 + Girls 17 **Total 46**	Boys 37 +Girls 14 **Total 51**
2.	**Adopted villages/ KVKs**	KVK, Shipuri:- Rator KVK, Aron:- Araskheda KVK, Seopur: - Indrapura, Lalitpura and Galmanya	➢ Shajapur KVK Girls students- 14 ➢ Rajgarh KVK -15 ➢ Ichhawar KVK - 22 ➢ Village-7 Total Farmer- 255
3.	**Technologies Dessimenated**	➢ Hybrid Verities of vegetable crops ➢ Water conservation Technology ➢ Seed treatment in Kharif and rabi crops ➢ Spacing, ➢ Plant protection in soybean, ground nut, pigeon pea. and mustard ➢ Soil sampling, ➢ Application of Micro-nutrients Management Practices of animal husbandry	➢ Soil testing ➢ Conduction of PRA ➢ Use of improved seed ➢ Seed treatment of different crops. ➢ Ridge Bed and ridge furrow method of sowing ➢ Soil and water management practices ➢ Increase the use of organic manures. ➢ Different irrigation techniques ➢ Water Harvesting. ➢ Biogas plant ➢ Proposed improved cultural practices for Agricultural crops, vegetables and fruit crops. ➢ Mushroom production. ➢ Method and Result Demonstration of different agri.practices ➢ Tree plantation. ➢ Cleaning of village. ➢ Participation in Blood Donation Camp, Health Care Camp& Animal care Camp. ➢ Cleaning of Drinking Water ➢ Participation in Adult Education programme. ➢ Giving Information about the cleanliness of Teeth, Cloths & Hand. ➢ Establishing a library in a village with the help of Sarpanch and young people of the village.

S.No.	Particular	Indore	Khandwa	Mandsaur
1.	**No. of student**	Boys 48 +Girls 34 **Total 82**	Boys 30 +Girls 18 **Total 48**	Boys 31 **+** Girls 20 **Total 51**
2.	**Adopted villages/KVKs**	-	KVK Badwani (16 Boys only) Villages- Balkuna-05 Lonsara-05 Kalibedi- 06 KVK Khargone (18 Girls only)Villages Piprata- 09 Baijapur- 09 KVK, Burhanpur (14 Boys only) Villages Umarda07 Nimandhar 07 Total Villages - 07 Total student- 48	Boys 31- KVK, Neemuch (Village-, Bhameshar, Ambikheda and Ramnagar) Girls 20– KVK, Ratlam (Village- Chipiya, Riyawan and Talidana
3.	**Technologies Dessimenated**	RAWE program, for 6 months the under the supervision of Program Coordinators of KVK's. Every student was allotted 1 host farmer in the adopted villages for his/ her learning experience in the field of crop production, crop protection and extension programs & other activities observed in village from time to time & sharing the experience through rapport building with their host farmers. The RAWE students observed the socio economic problems and agricultural problems, and also conducted farmer's group meeting, PRA activities, Krishak Sangoshthi to solve their problems and learnt from them. The following activities were performed by the RAWE students under the supervision of KVKs.	1. Drip irrigation system 2. Strategy for cost of cultivation 3. Application of PRA technique for the identification of agricultural livestock & poultry problem and planning 4. Nursery management 5. Fruit and vegetable preservation 6. Value addition of crops 7. INM 8. IPM 9. Sampling of soil for testing 10. Marketing strategies 11. Diversified farming practices Demonstration of improved varieties of Soybean, chilly, Banana, cotton etc.	1. During the Rural Horticultural Work Experience Programme students understood about rural conditions in relation to agriculture and allied sector like post harvest management, agriculture engineering, animal husbandry, poultry, Dairy etc. 2. Students learnt about cultivation practices of onion, garlic, soybean, moong, urd, cauliflower, cabbage, chilli, tomato, marigold, chrysanthemum, rose, brinjal, okra, beans, chandrasoor, fenugreek, cucumber, mango, guava, citrus and pomegranate etc. 3. Students learned about integrated nutrient management different horticultural crops. 4. They learned about raising nursery of different vegetables like tomatoes, chilies etc. 5. They learnt about different method of seed treatment in Garlic onion, wheat, coriander, methi, chandrasoor, soybean, moong, urd and other crops.

				6. Students learnt about drip irrigation and sprinkler system in Garlic, pomegranate, onion, citrus, ber etc. 7. They were trained to manage insect pest and disease in different crops like Marigold, rose, tube rose, okra, guava, grape, mango, garlic, onion cucumber, brinjal, tomato, cabbage, cauliflower, chilli, fenugreek and other crops. 8. Students got experience about harvesting and grading in different horticultural crops like cauliflower, cabbage, tomatoes, chillies, onion, garlic, bottle gourd and fenugreek etc. 9. Students developed skill for curing in onion and garlic crops. 10. They developed skill in budding, grafting and layering in different horticultural crops. 11. Students used sticky traps for management and control of insects in different crops. 12. They understand about use and importance of pheromone traps in fruits and vegetable crops. 13. They have developed communication skill to transfer available agricultural technologies among farmers community. 14. They have acquainted with on-going extension and rural development activities of state and central government. 15. They participated in different KVK activities to understand more about agriculture and its management.

GLIMPSES OF READY (RAWE/RHWE) PROGRAMME

Village attachment activities



Village attachment activities

Agro Industrial Attachment

RAWE Monitoring






READY students (Boys) with Dean, COH, Mandsaur and Course instructors.

READY students (Girls) at KVK Ratlam during visit of with Dean, COH, Mandsaur and Course instructors

Students ready for collection of soil samples for soil nutrient analysis at K.V.K., Neemuch

Student collecting soil samples from adopted farmers field

Visit of scientist at KVK Neemuch

Eradication of parthenium by RHWE students at KVK Neemuch

Preparation of waste decomposer by students at KVK Neemuch

Student's field visit by KVK Ratlam staff

Students performing agriculture activities in farmers field

Student performing weeding at farmers field

READY students with course instructors and KVK staff at KVK Neemuch

Students participating in Jal shakti Abhiyan Krishi Mela at Alhed and Jawad (Neemuch)

READY students with school student at Bhameshar discussing about human nutrition

READY students with school student at Bhameshar discussing about human nutrition

Students visiting Masala mandi at Neemuch

Students performing garlic sowing at farmers field by garlic planter

READY students analysing soil Samples at KVK

Conduction of Krishak Sanghosthi by READY

Neemuch

Students at soil testing lab at KVK Neemuch

Stuents with the help of KVK, Neemuch.

READY student performing pruning in citrus at KVK, Neemuch

Spray Imidacloprid 17.8 % S.L. @ 0.4ml/l or Thiamethoxam 25WG @ 0.3 g/L or Diamethoate 30 % E.C. @ 1.5ml/L of water in Citrus crop to control blackfly.

Performing Swachchhata Pakhwada at KVK Neemuch

Students were familiar with nature of damage of leaf miner infestation in marigold crop at farmer's field.

Bronzing is due to the deficient levels of Nitrogen, Phosphorous and Zinc,As Nitrogen and Phosphorous supplied by 19:19:19, $ZnSO_4$ is Sprayed as micronutrient spray

Inspection of unfruitfullness in Soybean at farmers field by READY students

READY students visited Betelwine farm under protected cultivation at Maru's farm at Manasa

Control aphid by spray Beauveria Bassiana 1.15 % WP @ 5g /L or Imidacloprid 17.8 % S.L.SP @ 0.4ml/l or Thiamethoxam 25WG @ 0.3 g/l of water in mustard crop.

Chilli plant infested by white fly and farmers were advised to control by spray of Acetamiprid 20% SP @ 0.3g/l or Diafenthiuron 50 % WP @ 1.2 g/ L of water

READY students visited goat farm to undertsnad about goat

Ready students performing sorting and packaging of grlic at farmers field

Student learning about treatment of garlic cloves with ready mix of Carbendazim 12% + Mancozeb 63% WP @ 3g/kg seed at farmer's field.

Student learning about grading in Garlic

READY Students learning about estimation of fat content in milk samples at milk collection unit

READY students at krishak sangoshti at Bhamesar

2.8 Thesis Submitted:

2.8.1 M.Sc. (Agriculture/Horticulture): 190 Students submitted Thesis for Post Graduate degree programme in Agriculture discipline and 73 students for Horticulture degree programme.

2.8.2 Ph.D. thesis submitted to Director Instruction for evaluation: 18 student's submiteed Thesis for Ph.D. Agriculture / Horticulture degree programme.

2.9 Academic Excellence:

2.9.1 Student Performance in ICAR-JRF/SRF examination and other Scholarship/Stipends:

S. No.	Name of Fellowship/Scholarship	No. of Students 2019-20
1.	Junior Research fellowship received	**02**
2.	JRF qualified and admitted in different Universities of India without fellowship	**-**
3.	SRF Qualified without fellowship	**-**
4.	NET	**03**
5.	National Talent Scholarship	**29**
6.	Scholarship of Vikramaditya Yojna	**-**
7.	Scholarship of Gaon Ki Beti Yojna	**-**
8.	Dr. Shyamaprasad Mukharji Scholarship	**27**
	Medhavi Sambal Yojna	**37**
9.	Mukhyamantri Medhavi Vidyarthi Yojana	**05**
10	Post Metric Scholarship	**594**
	State Government Scholarship	
	(i) OBC	**356**
	(ii) SC	**153**
	(iii) ST	**85**

3. STUDENTS WELFARE ACTIVITIES:

3.1 National Service Scheme (NSS):

S. No.	Activity(s)	No. of Volunteers Participated
1	No. of students enrolled	376
2	No. of students passed/cleared ***'B' certificate examination***	17
3	No. of students passed/cleared ***'C' certificate examination***	01
4	NSS day celebration/Camp	110
5	Blood donation camp	149
6	Pulse polio camp	18

7	AIDs awareness day	151
8	Beti Bachao Abhiyan	85
9	Malnutrition day	28
10	Parthenium eradication day	03
11	Special camp	33
12	Voter ID awareness camp	03
13	State level camp	02
14	Unit camp	106
15	Rastriya Yuva Day	65
16	Sensitization day	25
17	Environment day	150
18	Plantation day	190
19	International Woman's Day	-
20	Awareness Programme	-
21	Pre. RD Camp	-

GLIMPSES OF NSS ACTIVITIES

Mornig rally by students

Cleanliness by students

Mornig rally by students

Mornig rally by students

Mornig rally by students

Mornig rally by students

Students interaction with sarpanch

Students making NSS shape

Former NSS I/C Dr G. S. Chundavat addressed students on last day

Blood donation camp

Blood donation camp27/01/2020

Blood donation by students

RRC I/C Dr S B Singh with students

Girls for haemoglobin check-up

Scene out side the camp

Blood donation by student

Blood donation by student

Blood donation by student

Enthusiasm for blood donation

Girl student Pooja jatav donated blood

College staff Mr Prakash donated blood

3.2 National Cadet Corps (NCC):

S. No.	Activity(s)		Total Students
1.	No. of students enrolled		121
2.	Exam. passed	***'B' certificate***	60
		'C' certificate	28
3.	No. of cadets attended the CATC camp		60
4.	Army Attachment at Gwalior		-

Glimpses of NCC activities




3.3 Students Counseling and Placement:

S. No.	Name of employer / Organization	No. of students employed
1.	Central Govt.	11
2.	Government /public sector	29
3.	Private sector	33
4.	Self employed	03
Total		**76**

3.4 CULTURAL AND SPORTS ACTIVITIES:

3.4.1 CULTURAL ACTIVITIES

3.4.1.1 Cultural activity at University level: A festival of knowledge and Inter-Collegiate cultural competition was organized at College of Agriculture, Gwalior (January 9-11, 2020). Five constituent colleges of the Vishwa Vidyalaya *viz.* College of Agriculture, Gwalior, Indore, Sehore, Khandwa and College of Horticulture, Mandsaur participated enthusiastically in the competitions held under 18 categories of singing, dancing, fine arts and theatre.

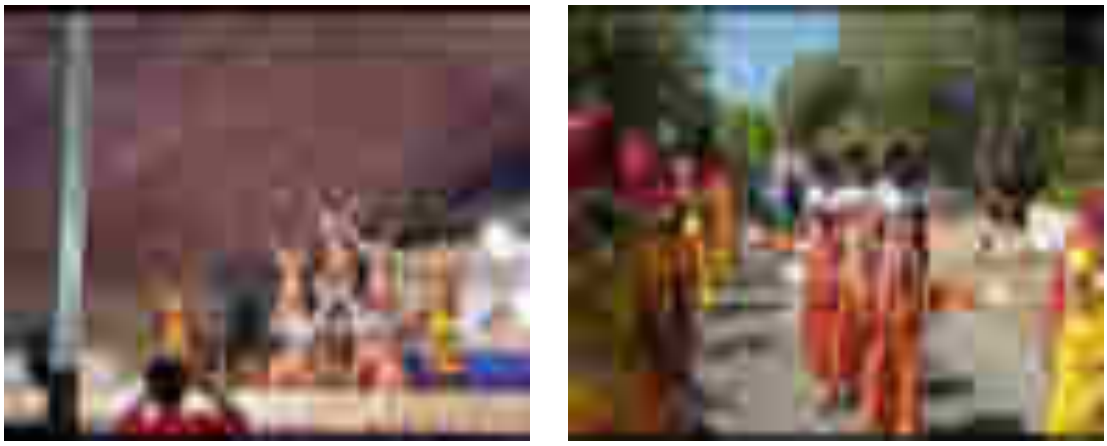
"Youth Festival" Inter-Collegiate Cultural Competition- a meeting place for creative minds to discuss their ideas and allow for testing of their ideas in the face of intense competition, rigorous evaluations and a touch of the carnival. Winners of the competitions were awarded certificates, trophies in the intra-college events.

S.No.	Activity	Winner
1	One Act Play	College of Agriculture, Gwalior
2	Folk Dance	College of Agriculture, Gwalior
3	Skit	KNK, College of Horticulture, Mandsaur
4	Elocution	College of Agriculture, Gwalior/ KNK, College of Horticulture, Mandsaur
5	Patriotic Song	KNK, College of Horticulture, Mandsaur
6	Group Song	College of Agriculture, Gwalior
7	Rangoli Competition	RAK, College of Agriculture, Sehore
8	Mono Acting	College of Agriculture, Gwalior
9	Cartooning	College of Agriculture, Gwalior
10	Poster Making	BM, College of Agriculture, Khandwa
11	Debate (Against)	College of Agriculture, Gwalior/Indore/Khandwa & KNK, College of Horticulture, Mandsaur
12	Solo Song	RAK, College of Agriculture, Sehore
13	Extempore	College of Agriculture, Gwalior
14	Quiz Competition	BM, College of Agriculture, Khandwa
15	On spot Painting	College of Agriculture, Gwalior
16	Clay Modeling	College of Agriculture, Gwalior
17	Mime	College of Agriculture, Indore

PARTICIPATION OF STUDENTS IN NATIONAL EVENTS

//AGRIUNIFEST//

- 19th All India Inter Agricultural University Youth Festival was organized by Sardarkrushinagar Dantiwada Agricultural University, Sardarkrushinagar, Dist: Banaskantha, Gujarat during 03rd to 07th February, 2019. Students (22) of this university actively participated in the events.



Glimpses of the opening and closing ceremony of 19th All India Inter Agricultural University Youth Festival at Sardarkrushinagar Dantiwada Agricultural University, Sardarkrushinagar

- Twenty Two Students (08 boys and 14 girls) of RVSKVV, Gwalior participated in 20th All India Inter Agricultural University Youth Festival organized at Indira Gandhi Krishi Vishwa vidyalaya, Raipur (Chhattisgarh) during 08 to 12 February, 2020 and received Silver Medal in Patriotic Song (Indian) and Fourth Position in Clay Modeling & Cartooning competitions.

Glimpses of the opening and closing ceremony of 20th All India Inter Agricultural University Youth Festival at Indira Gandhi Krishi Vishwa vidyalaya, Raipur (Chhattisgarh)

GLIMPSES OF CULTURAL ACTIVITIES

Participants of 11th Inter Collegiate Youth Festival at Gwalior

III Year student Mr.Naveen Tiwari participating in 20th all India Inter Agricultural Universities Youth festivat at IGKVV, Raipur

3.2 SPORTS ACTIVITIES:

(1) College of Agriculture, Gwalior-The performance of the various teams is as under:

S. No.	Activity	Male		Female	
		Winner	**Runner**	**Winner**	**Runner**
1.	Badminton	-	-	-	✓
2.	Athletics	✓		✓	-
3.	T.T.	-	✓	-	✓
4.	Volley ball	✓	-	-	-
5.	Kabaddi	✓	-	-	-
6.	Kho-Kho	✓	-	-	-

(2) College of Agriculture, Indore- Indoor games – Held at B. M. College of Agriculture, Khandwa during 12-14 December 2019. The details of the performance of the teams as follows:

Activity	**Male**		**Female**	
Badminton	Mr. Sanjay Verma	**Runner**	KuNeha Patel	**Participated**
	Mr. Shyam Patidar		Ku. Swarnima Kaurav	
	Mr. Satyam Upadhyay		Ku. Soniya Chouhan	
	Mr. Lakhan Patel		Ku. Sanu Patel	
T. T.	Mr. Yashraj Solanki	**Participated**	Ku. Vineeta Patidar	**Participated**
	Mr. Madhusudan Popandiya		Ku. Samriddhi Udaywal	
	Mr. Jay Narayan Patel		Ku. Nikita Patidar	
	Mr. Krishna Patel		Ku. Deshie Choubey	
Carrom	Mr. Shubham Kumar Badvan	**Participated**	Ku. Sonu Suryavanshi	**Runner**
	Mr. Deepak Surage		Ku. Aayushi Solanki	
	Mr. Sikra Soliya		Ku. Tara Kanel	

Volley Ball		**Kabaddi**	
Mr. Sanjay Verma	**Participated**	Mr. Chandrashekhar Parmar	**Runner**
Mr. Nikhil Patil		Mr. Sanjay Verma	
Mr. Sumit Patel		Mr. Saurabh Louvanshi	
Mr. Pankaj Waskel		Mr. Ravindra Birla	
Mr. Shubham Sahu		Mr. Krishn Kant Patel	
Mr. Sattyam Upadhyay		Mr. Hukum Chandra Iyer	
Mr. Abhishek Malgaya		Mr. Durgesh Mujalde	
Mr. Yogesh Chandrawanshi		Mr. Manoj Yadav	
Mr. Vineet Vaibhav		Mr. Deepu Prajapati	
Mr. Ratnesh Singh Dhurve		Mr. Aman Shrivastav	
Mr. Ajay Chouhan		Mr. Ankit Parmar	
Mr. Lokendra Verma			
Kho-Kho			
Mr. Madhusudan Popandiya	**Participated**	Mr. Nitesh Chouhan	**Participated**
Mr. Amitesh Patil		Mr. Shantilal Bhamboriya	

Mr. Prakash Sisodiya		Mr. Vishal Ikwale	
Mr. Aniket Chouhan		Mr. Rohit Rawat	
Mr. Lakhan Patel		Mr. Swapnesh	
Mr. Chetan		Mr. Sandeep Tomar	

ATHLETICS - The Athletics events were held at College of Agriculture, Gwalior during 15-17 January 2020. The details of the performance of the teams as follows:

Activity	**Male**		**Female**	
100 m	Mr. Amitesh Patil	**S**	Ku. Reena Nigwal	**S**
200 m	Mr. Amitesh Patil	**S**	Ku. Kirti Gaur	**B**
400 m	Mr. Amitesh Patil	**G**	Ku. Reena Nigwal	**S**
800 m	-	**-**	Ku. Neha Patel	**S**
1500 m	-	**-**	Ku. Sangeeta Jamare	**B**
4 x 100 m	Mr. Amitesh Patil	**B**	Ku. Reena Nigwal	**B**
	Mr. Sumit Patel	**B**	Ku. Kirti Gaur	**B**
	Mr. Hukum Chandra Iyer	**B**	Ku. Tara Kanel	**B**
	Mr. Ajay Chouhan	**B**	Ku. Neha Patel	**B**
Shot-put	-	**-**	Ku. Deshie Choubey	**B**
Discuss	Mr. Hukum Chandra Iyer	**B**	Ku. Mahak Chaturvedi	**G**
Javelin	-	**-**	-	**-**
Long Jump	Mr. Vishal Ikwale	**S**	Ku. Reena Nigwal	**S**
High Jump	Mr. Hukumchand Iyer	**B**	Ku. Neha Patel	**B**
Total telley of Medals				
Gold		**1**		**1**
Silver		**3**		**4**
Bronze		**3**		**5**
		7		**10**

03 players from College of Agriculture, Indore were selected in RVSKVV, Team and participated in XX All India Agricultural University Sports and Games meet 2019-20. The meet was held at **Venkateswara Veteinary University, Tirupathi during 1st to 5th March 2020**. Ku. Mahak Chaturvedi Mr. Amitesh Patil Mr. Chandrashekhar Parmar

(3) RAK, College of Agriculture, Sehore- In this year Intercollegiate Sports & Games Meet 2019-20, held at College of Agriculture, Khandwa and College of Agriculture, Gwalior Badminton/ Table – Tannis/ Carrom (Men & Women), Vollyball & Kho-Kho (Man) were organized at College of Agriculture, Khandwa during 12 December - 14 December, 2019. Forty four players (Thirty four boys and ten Girls) were represented our college and Games of carrom (Boys) runner of the college team. Participant inthis game Mr. Hareesh Nayak, Shyam Lal Rawat, Ankit Malviya And Ujwal Kavreti Athletics (Men & Women) & Kabaddi (Men) were organized at

College of Agriculture , Gwalior during 15 to 17 January 2020. Twenty eight players (eighteen Boys and ten Girls) were represented our college.

(4) BM, College of Agriculture, Khandwa-College organized Inter Collegiate Indoor Games Under the title (***Spandan2019***) Viz, Badminton, Table tennis, Carom, Chess, and outdoor games namely Volley Ball and Kho-Kho Tournament of R.V.S.K.V.V, from 12-14 Dec 2019. College of Agriculture Khandwa was Winner in Carom (Boys and Girls Both), Table Tennis (Boys and Girls Both), and Badminton (Boys Section) and runner in Kho-Kho, Volleyball.

(5) KNK, College of Horticulture, Mandsaur-

S.No.	Activities	Winner		Runner	
		Male	Female	Male	Female
1.	Badminton-Single	-	Winner	-	-
2.	Badminton-Double		Winner	-	-
3.	Running 1500	Winner	-	-	-
4.	Running 800	-	-	Runner	-
5.	Long jump	-	-	Runner	-

PARTICIPATION OF STUDENTS IN NATIONAL EVENTS

Games & sports: Inter collegiate sports/cultural meets have served to link together the five colleges of the university paving the way for participation at national level. The students have participated in **Eleven** inter university **agriunisports** and **Ten youth festivals** during 2008 to 2020. The performance of students in various sports and cultural meets has been admired.

AGRIUNISPORTS

- Forty Three Students (30 boys and 13 girls) of RVSKVV, Gwalior participated in XIX All India Inter Agricultural University Sports and Games meet "AGRIUNISPORTS 2019" organized at Punjab Agricultural University, Ludhiana during 02nd to 05rh January, 2019 and their performance was appreciated by one and all.

Inaugural function of XIX All India Inter Agricultural University Sports
And Games Meet at Punjab Agricultural University, Ludhiana

- Forty Students (28 boys and 12 girls) of RVSKVV, Gwalior participated in XX All India Inter Agricultural University Sports and Games meet "AGRIUNISPORTS 2020" organized at Sri Venkateswara Veterinary University, Tirupati (A.P.) during 01st to 05rh March, 2020 and received **Gold Medal in High Jump.**

Inaugural function of XX All India Inter Agricultural University Sports
and Games Meet at Sri Venkateswara Veterinary University, Tirupati (A.P.)

GLIMPSES OF SPORTS ACTIVITIES

5. RESEARCH HIGHLIGHTS:

The research network of the University spreads over six agro-climatic zones of Madhya Pradesh and covers 26 revenue districts. These agro-climatic zones are Gird, Malwa Plateau, Nimar Valley, Jhabua Hills, Vindhyan Plateau and Bundelkhand zones. Accordingly, five Zonal Agricultural Research stations, four Regional Agricultural Research Stations and five Special Research Stations have been operating to enhance the productivity and livelihood security of farming community. Presently, 27 All India Coordinated Research Projects on crop improvement, natural resource management and horticulture are running at different centers. Besides these, 7 plan, 12 non plan, 23 tribal sub plan, 5 Agromet Advisory services, 05 externally funded projects are the research strength of the University. The maintenance breeding of crop varieties and production of nucleus seed, breeder seed, hybrid seed and planting materials are managed with the help of twenty seven seed farms.

Research Stations of the University

S.No.	Particulars	No.	Location and Year of Establishment
1.	Zonal Agricultural Research Station	05	Indore (1924), Sehore (1952), Khargone (1964), Morena (1981) and Jhabua (1989)
2.	Regional Agricultural Research Station	04	Gwalior (1916), Khandwa (1964) Ujjain (1989) and Mandsaur (1964)
3.	Special Research Station	06	Enthkedi (1962), Jaora (1964), Bagwai (1964), Badwah (1969), Bhind (2010) and Sirsod (2011)

4.1 List of All India Coordinated Research Projects

S.No.	Name of Projects	Centre
1	AICRP on Water Management	Morena
2	AICRP on Groundnut	Gwalior
3	AICRP on Rapeseed & Mustard	Morena
4	AICRP on Safflower	Indore
5	AICRP on Soybean	Sehore
6	AICRP on Cotton Improvement Project	Khandwa
7	AICRP on Sorghum improvement	Indore
8	AICRP on Chickpea	Sehore
9	AICRP on Pigeonpea	Khargone
10	AICRP on Pearl Millets	Gwalior
11	AICRP on Wheat Improvement Project	Gwalior
12	AICRP on Dryland Agriculture	Indore
13	AICRP on Medicinal and Aromatic Plants	Mandsaur
14	AICRP on Salt Affected Soils	Indore
15	AICRP on Weed Control	Gwalior
16	AICRP on Arid Legumes (Guar)	Gwalior
17	AICRP on Pigeonpea (Sub Centre)	Sehore
18	AICRP on MULLaRP	Sehore
19	AICRP on Integrated Cropping System	Indore

20	AICRP on Fruits (Grape)	Mandsaur
21	AICRP on Chickpea	Indore
22	AICRP on Soybean	Morena
23	AICRP on Onion & Garlic	Mandsaur
24.	ICAR Seed Project on Seed Production in Agricultural Crops	Gwalior

4.2 Research Schemes (Non Plan)

S. No.	Name of Scheme/Project	Centre
1	Agriculture Research Lab & Institute	Indore
2	Regional Research Station	Indore
3	Soil Testing Scheme	Indore
4	Regional Research Station	Sehore
5	Regional Research Station	Gwalior
6	Regional Research Station	Bagwai
7	Intensification of Research on Mango Guava & Citrus	Gwalior
8	Soil Testing Scheme	Gwalior
9	Intensification of Research on Mango, Guava & Citrus	Enthkedi
10	Horticulture Research Scheme (Seed production)	Jaora
11	Sugarcane Research Scheme	Indore
12	Potato Aphid Research	Sehore

Seed Farms (Non Plan)

S. No.	Name of Scheme/Project	Centre
1	Agriculture Research Farm	Mandsaur
2	Agriculture Research Farm	Khargone
3	Agriculture Research Farm	Khandwa
4	Agriculture Research Farm	Bagwai
5	Agriculture Research Farm	Gwalior
6	Agriculture Research Farm	Ujjain
7	Agriculture Research Farm	Jaora
8	Agriculture Research Farm	Indore
9	Agriculture Research Farm	Sehore
10	Live Stock Farm	Gwalior
11	Live Stock Farm	Sehore
12	Live Stock Farm	Indore

4.3 Research Schemes (Plan)

S. No.	Name of Scheme/Project	Centre
1	Fodder Research Scheme	Gwalior
2	Strengthening of MP Agriculture Research Institute	Khargone
3	Productivity Improvement of crops under rainfed area	Indore
4	National Agricultural Research Project	Sehore
5	Director of Extension Education	Sehore
6	National Agricultural Research Project	Ujjain
7	College of Horticulture	Mandsaur

4.4 India Meteorological Department (GOI)

S. No.	Name of Scheme/Project	Centre
1	Agromet Advisory Services	Morena
2	Agromet Advisory Services	Khargone
3	Agromet Advisory Services	Jhabua
4	Agromet Advisory Services	Sehore
5	Agromet Advisory Services	Indore

4.5 Externally Funded Projects

S. No.	Title of the Project	Funding agency	Principal Investigator	Budget (Rs. in lakhs)
01	Survey study of Krishi Upaj Mandies (KUM) of Gwalior and Chambal Division of M.P. for identification of causes and control of their losses	Mandi Board	18.70	Dr S. C. Srivastva, Technical officer to DRS, Directorate of Research, RVSKVV, Gwalior
02	Evaluation of groundnut germplasm for folier disease persistence and fatty acid composition using Marker Assistant Selection Approaches	MPCOST	9.30	Dr Sushma Tiwari, Scientist Plant Breeding, CoA, Gwalior
03	Strengthening of seed infrastructure facilities at soybean breeder seed production centers	Indian Institute of Seed Science, ICAR, Mau	187.814	DRS
04	Establishment of Modal Nursery under RVSKVV, Gwalior at Krishi Vigyan Kendra, Gwalior & Neemach	FWAD, Bhopal	95.00	DRS SSH, KVK, Gwalior SSH, KVK, Neemach

05	Technology dissemination through Frontline demonstration plots MIDH	DSSD, Calicut	8.30	DES, RVSKVV, Gwalior
06	Project under Entrepreneurship Development Programme (EDP) on "Fruit and Vegetable Processing at Fruit Research Station, Entkhedi, Bhopal M.P."	National Research Development Corporation, New Delhi	3.00	Dr. Shalini Chakraborty, Scientist, Fruit Research Station, Entkhedi, Bhopal M.P.
07	Insecticide Resistance Management: Dissemination of pink bollworm management strategies	Central Institute for Cotton Research, Nagpur	10.00	Dr S. K. Parsai, Senior Scientist (Entomology), RVSKVV, CoA, Khandwa
8	Delivering more produce and income to farmers through enhancing genetic gains for chickpea and pigeonpea	DAC, New Delhi	27.02	Dr. M. Yasin, PS (PB), AICRP on Chickpea, CoA, Sehore
9	Validation and Promotion of Location specific Prioritized Component-wise IPM Package in Rapeseed-Mustard	NCIPM, New Delhi	6.00	Dr J. C. Gupta ZARS, Morena
10	Construction of Auditorium and Symposium Hall	Mandi Board	1189.61	DRS, RVSKVV, Gwalior
11	Establishment of gene bank at Biotechnolgy Centre RVSKVV, Gwalior	Mandi Board	925.00	Dr M.K.Tripathi, Principal Scientist College of Agriculture, Gwalior

4.6 Salient Research Achievements:

- **Release /Registered /Notified of New varieties**

  - **Raj Vijay Gram 210 [RVG 210]:** This variety was released by Madhya Pradesh State Seed Sub Committee for cultivation in Madhya Pradesh in its meeting held on June 03, 2019 at Mantralaya, Bhopal. It is an variety early maturing variety (109 days), bold seed size (26.7 g hundred seed weight), average yield potential 1805 kg/ha and resistant to *Fusarium* wilt. It have yellowish cream seed coat, extra bold seed size, round seed shape, good looking, early maturing and high yielding variety in desi pea shaped category.

  - **Raj Vijay Kabuli Gram 121 [RVKG 121]:** This variety was released by Madhya Pradesh State Seed Sub Committee for cultivation in Madhya Pradesh in its meeting held on June 03, 2019 at Mantralaya, Bhopal. It is an variety matures in 114 days, bold seed size (26.30 g hundred seed weight), average yield potential 1970 kg/ha. It has resistant to *Fusarium* wilt**Tolerance to pod borer *(Helicoverpa armigera*) and pulse beetle.**

- **Chickpea Variety Raj Vijay Gram 204 (RVG 204)** :It has Long plant, bold seeded, matures in 111 days, resistant to wilt and tolerance to pod borer and potential yield is 2300-2500 kg/ha. It is suitable for mechanical harvesting Madhya Pradesh

- **Chickpea Variety Raj Vijay Gram 205 (RVG 205)** : It has Long plant, pink flower, bold seeded, matures in 107-118 days, resistant to wilt and tolerance to pod borer and potential yield is 2000-2500 kg/ha. It is First green seeded variety of M.P.

- **Chickpea (Kabuli) Variety Raj Vijay Kabuli Gram 111 (RVKG 111)**: It have long plant, bold seeded(26.12g/100 seed), matures in 117 days, moderately resistant against *Fusarium* wilt, Root Rot (DRR) and tolerant to pod borer (*Helicoverpa*) and pulse beetle. The potential yield is 2000-2200 kg/ha. It is recommended for semi irrigated to irrigated conditions of MP.

- **Chickpea (Kabuli) VarietyRaj Vijay Kabuli Gram 151 (RVKG 151** :It have medium tall (38.7cm) with semi spreading plants and bold seeds (54.3g/100 seed). It

matures in 113 days, resistant to moderately resistant against *Fusarium* wilt, Dry Root Rot (DRR) and tolerant to pod borer (*Helicoverpa*) and pulse beetle. The potential yield is 2000-2100 kg/ha. It is recommended for timely sown semi irrigated to irrigated conditions of MP.

- **Lentil** variety **RVL 13-7**: It matures in 102 days with the average grain yield 1300-2300 kg/ha. Its plant type is semi erect, medium height (36-40cm) and branches with broad leaf which is very much suitable for intercropping.Large seed size of 3.2 g/100 seed, tolerant to wilt, shattering resistant and escape the drought. Recommended for timely sown conditions of MP.

- **Lentil** variety **RVL 13-5**: Its plant type is semi erect, maturity duration is 106 days; medium height and branches with broad leaf, which is very much suitable for intercropping and its potential yield is 14 q/ha.

- **Cotton variety RVK 11**have been Notified vide No. (SO 3220 (E) 06.09.2019 for south Zone (Tamil Nadu, Karnataka, and Andhara Pradesh) belonging to medium maturity group, and found tolerant to sucking pests. In rainfed production system was given by the variety was with a yield potential of 2400 kg /ha.

Following varieties were released by Madhya Pradesh State Seed Sub Committee for cultivation in Madhya Pradesh in its meeting held on June 03, 2019 At Mantralaya, Bhopal (M.P.)

- **Raj Vijay Gram 210 [RVG 210]:** It is an early maturing variety (109 days), bold seed size (26.7 g / hundred seed weight), average yield potential 1805 kg/ha and resistant to *Fusarium* wilt. It has yellowish cream seed coat, round seed shape and early maturity.

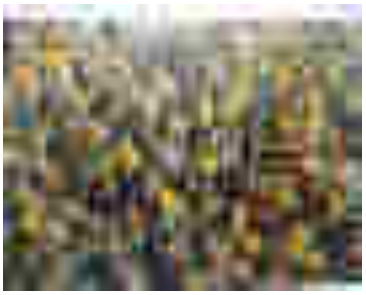
- **Raj Vijay Kabuli Gram 121 [RVKG 121]:** It is a variety which matures in 114 days, having bold seed size (26.30 g / hundred seed weight), average yield potential 1970 kg/ha. It has resistance to *Fusarium* wilttolerance to pod borer *(Helicoverpa armigera*) and pulse beetle.

Following varieties were released by Madhya Pradesh State Seed Sub Committee for cultivation in Madhya Pradesh in its meeting held on September 26, 2019 at Mantralaya, Bhopal

- **Lentil variety RVL 15-1**: It matures in 100 days with the average grain yield 1700 kg/ha. Its plant type is semi erect, medium height and branches with broad leaf which is very much suitable for intercropping.Large seed size of 3.05 g/100 seed, resistant to wilt, shattering resistant and escape the drought. Recommended for timely sown conditions of MP.

- **Mustard** variety **Raj Vijay Mustard 3**: It matures in 125-139 days with yield potential is 1800-2800 kg/ha, Shape of leaf pinnate and petiolate dark green, thick at bottom and thin smooth on upper portion of the plant, plant height (182-228cm), Yellow Flower, Dark brown to reddish brown Seed colour, 1000 seed wt (g): 3.7-4.4 g, Oil content 37-42%, Moderately resistance to *Alternaria* leaf blight, powdery mildew and downy mildew& white rust, and tolerant to resistant for *Sclerotinia* stem rot.

- **Safflower** variety **Raj Vijay Safflower – 14-1 (RVSAF 14-1) :**It matures in 121 days with the average grain yield 1800-2200 kg/ha. Its plant type is spiny and big capitulum and Colour of flower is orange red, plant height 80-100 cm, Oil content 29-30%, lodging resistant, shattering resistant, Moderately tolerant to wilt.

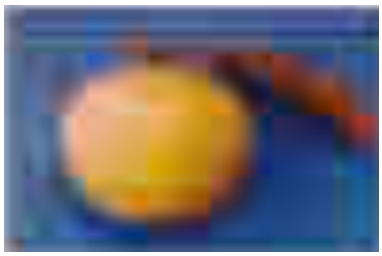


- **Guava** variety **Gwalior-Bahar**: This variety fruits are oblong in shape and have higher fruit weight, fresh thickness, fruit yield and total soluble sugars. Fruit weight 244g, length 7.80cm, width 7.40 cm, flesh thickness 1.53 cm, TSS 8.3^0b, Number of seeds/100 g pulp277, weight of seeds/100g pulp1.7g and yield per plant is 85-90kg and Fruit matures in 125-130 days.

- **Guava** variety **Gwalior-8**: This variety is a selection from Allahabadi Safeda Seedlings, fruits are medium to medium large with cream white, thick flesh, few seeds, acid sweet, good quality and heavy bearer, fruits are mostly round shaped. Fruit weight 282 g, length 7.50 cm, width 8.30 cm, flesh thickness 2.53 cm, TSS 9.07^0b, Number of seeds/100 g pulp 138, weight of seeds/100g pulp1.40g and yield per plant is 88-95 kg. and fruit matures in 118-125 days.

- **Guava** variety **Gwalior-21**: This variety is a selection from Allahabadi Safeda Seedlings, fruits are medium to medium large with cream white, thick flesh, few seeds, acid sweet, good quality and heavy bearer, fruits are mostly round shaped. Fruit weight 301.5 g, length 7.29 cm, width 8.10 cm, flesh thickness 1.78 cm, TSS 9.02^0b, Number of seeds/100 g pulp 142, weight of seeds/100g pulp1.77g and yield per plant is 85-90 kg and Fruit matures in 120-125 days.

- **Guava** variety **Gwalior-27**: This variety is a selection from Allahabadi Safeda Seedlings, fruits are medium to medium large with cream white, thick flesh, few seeds, acid sweet, good quality and heavy bearer, fruits are mostly round shaped. Fruit weight 279.67 g, length 7.72 cm, width 7.14 cm, flesh thickness 1.62 cm, TSS 11.92^0b, Number of seeds/100 g pulp 163, weight of seeds/100g pulp1.37g and yield per plant is 85-90 kg. and Fruit matures in 120-125 days



- **Asalio (Chandrasur)** variety **Raj Vijay Asalio-1001**: Its Early maturing (110-115 days)variety with yield potentials 1800-1900 kg/ha, Narrow leaf, Plant height (92.41 cm), No. of Branch/Plant(14.27), 100 seed weight 1.9g, oil content 20 % and Resistant to Alternaria leaf blight

- **Asalio (Chandrasur)** variety **Raj Vijay Asalio-1016**: Its Medium maturing (121-126 days) with yield potentials 1800-1900 kg/ha, Mid broad leaf, Plant height (92.75 cm), No. of branch/Plant(14.0), 100 seed weight 1.93 g, oil content 20 % and resistant to alternaria leaf blight

- **Safed Musali** variety **Raj Vijay Safed Musli-412**: It matures in 85-95 days, Herbasius stemless plant with 3 to 4 flowering scape, Non lodging type, fasciculated root/ha, yield potentials 3000-3400 kg/ha (root), Root powder content 1.15 % sapogenine and 9.2 % steroidal saponine and resistant to fasciculated root rot

Reflections of ongoing projects (Research Achievements)

- **Triumph in the development of new Soybean line RVSM 2011-35:** Entry of soybean **RVSM 2011-35** was identified asthe high yielding strain of soybean for Central Zone under AICRP network of IVT which ranked **Ist position** in seed yield and gave 12 % higher seed yield over best check (JS 335) and matured in 94 days with seed index 12 (g) in the 49th Annual Group Meeting which was held at BAU, Ranchi during March 16-18, 2019. This strain was developed at Morena in collaboration with Sehore Center. This strain has high degree of resistance to YMV which is under the mandate of Morena center

- **Evaluate response of chickpea genotypes to molybdenum seed supplementation** -In a station trial conducted to evaluate response of chickpea genotypes to molybdenum seed supplementation along with *Rhizobium+PSB* application, significant effect of molybdenum supplementation @1g ammonium molybdate/kg seed along with *Rhizobium+PSB* on various genotypes of chickpea was observed. Effect of Genotypes as well as of Mo found significant. .JAKI 9218 yielded highest. Interaction was non significant, however JG 16 and RVG 202 responded highest (13.8% yield increase) to molybdenum application.

- **Management of sodic Vertisols through resource conservation technologies:** The field experiment was carried out during rabi 2018-19 at Salinity Research Farm, Barwaha on Management of sodic vertisols through resource conservation technologies in rice-wheat cropping system. The experiment was laid out in split plot design and tillage treatment viz., conventional tillage (T1), Reduced tillage (T2), zero tillage (T3) and fallow (T4) were allotted in main plot and mulches viz., no mulch (M0) and with mulch (M1) were allotted in sub plot. Results revealed that the highest seed yield (33.15 q/ha) was obtained under zero tillage with mulched plot followed by in conventional tillage with no mulch.

- **Integrated disease management Modules against bacterial stem rot and blight diseases of opium poppy -** Integrated disease management organic modules against bacterial stem rot (Erwinia spp.) and blight disease of opium poppy were evaluated at research field, RVSKVV, College of Horticulture, Mandsaur. Among the integrated disease management modules against bacterial stem rot and blight disease, In furrow soil application of Neem cake mixture (100g/m^2) enriched with Trichoderma + Pseudomonas talc based formulation each @ 2.0% at sowing plus

seed treatment with streptocycline @ 0.035% plus drenching with Hexaconazol 5Ec @ 0.1% at 40, 55 and 70 DAS resulted minimum bacterial stem rot disease (20.78%) and higher latex (58.39 kg), seed (994.62 kg) and capsule husk yield (916.25 kg) over control (37.56%, 41.44 kg, 777.88 kg & 681 kg/ha respectively).

- **Agro- ecological Analysis of various insect- pest on Brassica crops -** The field experiment was conducted on four different cultivars of Brassica varieties. The variety namely B.J. RH-749, E. Sativa JMTA-06-01, B.napus GSL-1 and B. rapa, NC-1 verities was sown in TS & LS condition in different major insect –pest in Brassica crops . The Result indicate that that the aphid appearance was recorded on SMW 1 st .The highest peak level of aphid population/ top 10 cm top twig 0.4 to 3.0 , SMW 3rd to SMW 7th and The highest peak level of aphid population/ top 10 cm top twig 0.4 to 3.5 , SMW 1st to SMW 13 th was found in all four varieties in Timely Sown & Late sown Condition. The temperatue range 26to 31° C maximum and 8.1to 15.4° C minimum were conductive for aphid population. The peak activity of coccinelllides appearance of adults /plant 0.2 to 1.4 SMW 6th to SMW 9 th was found in all Brassica varities . The temperature range 26 to 31° C maximum and 8.1to 15.4° C minimum were conductive for aphid & coccinelllides population.
- Activities of Honey bee *Apis mellifefa L.*pollinators visit /minute/plant on four different cultivars of Brassica varieties. The variety namely B.J. RH-749, E. Sativa JMTA-06-01, B.napus GSL-1 and B. rapa, NC-1 verities was sown in TS &LS condition. The highest peak activity of honeybee 0.2 to 1.0 SMW 1st to SMW 9th was found in all Brassica varities. The temperature range 26 to 31° C maximum and 8.1to 15.4° C minimum. Honey bee *Apis mellifefa L*positively associated with maximum temperature as well as minimum temperature at flowering stage .
- **Effect of mulches and scheduling on yield of cabbage and soil properties of Vertisols:** A field experiment was conducted on Effect of mulches and scheduling on yield of cabbage and soil properties of Vertisols at Salinity Research Farm, Barwaha during rabi season of 2018-19. The experiment was laid out in strip plot design. In main plot irrigation scheduling was allotted (S_1: daily irrigation, S_2: Alternate day and 3rd day scheduling), while in sub plot four mulches were allotted (M_1: no mulch, M_2: plastic mulch, M_3: rice straw mulch and M_4: wheat straw mulch). Among the scheduling, the highest cabbage yield (1011 kg/ha) was observed in daily irrigation it was closely followed by alternate day scheduling (8980 kg/ha). However, the lowest yield was recorded with 3rd day irrigation scheduling. Similarly, among the mulching treatments, plastic mulching produced highest

yield of cabbage (7667 kg/ha) followed by wheat straw. The lowest yield was obtained in no mulched plot.

- The experiences gathered from the construction of these five water harvesting tanks through participatory approach under NICRA during 2018-19 suggested that the construction of tanks not only beneficial to bigger farmers but also helpful to enhance productivity and farm income to small farmers who construct the small sized tanks even in a smaller portion of their fields. With the success and advantages of theses tanks in the very first year, the farmers are overwhelmed and motivating other farmers to adopt this technology. It is a perfect example of coordination between scientists and farmers. The surprising and encouraging results and impacts of these tanks, proved the hypothesis wrong that the construction of water harvesting tanks is not professionally beneficial not to the small and marginal farmers but only to large and big farmers.

- **Weed management in potato in maize based organic cropping system:** Among all the non chemical methods of weed control, soil solarisation followed by black plastic mulch gave maximum tuber yield (28 t/ha) as well as reduced the weed density and dry weight of weeds followed by soil solarisation + hand weed at 40DAP (26.0 t/ha). The lowest yield was recorded in weedy check plot (13.87 t/ha).

- **Management of problematic weeds *Cuscuta*in berseem:**Imazethapyr 40 g/ha after 1st cutting of berseem was effective to control the *Cuscutta*. Same treatment recorded higher seed and fodder yield of berseem. Application of pendimethalin 1.0 kg/ha after 10 days of sowing was also found effective to control the C*uscutta* and other weeds and getting higher yield.

- **Biological control of water hyacinth by *Neochetina spp*.**: This experiment was conducted in 2015 in the pilua dam near Morena District. The water level in pond was around 10 feet. After 3 years on an average 80-90 feeding scars / leaf of water hyacinth were observed due to infestation of *Neochetina spp*. It was also observed that feeding of leaves was very high and further dried. Around 85-90%

(scale1) die back symptoms were observed on water hyacinth in 2018. Now pond is free from water hyacinth in 2019.

Weevils released in pond full of water hyacinth in 2015(Before)

The same pond cleared from water hyacinth by the weevils in 2019 (After)

- **Effect of levels of slope and method of irrigation in soybean – wheat cropping system :**Sowing of rainy crops on flat bed is the practice in central India which resulted plant mortality due to temporary water logging several times. The initial stages of pulse crops are more sensitive from water logging in comparison to later stage. Similarly in winter season also excess use of irrigation water by traditional method is in practice, resulting declining water table, deteriorating quality and increasing energy for pumping. Higher growth and yield attributing characters at 0.1% slope under permanent broad bed and furrow method of irrigation produced higher growth and yield attributing characters, seed (1.76 t ha^{-1}) and straw yield (2.38 t ha^{-1}), net returns (Rs. 26,781 ha^{-1}), B:C ratio (2.04), and water productivity of soybean. Similarly higher growth, yield attributing characters and grain yield (5.29 t ha^{-1}) with maximum gross returns (Rs. 94,143 ha^{-1}), net profit (Rs. 68,424 ha^{-1}), B:C ratio (3.66) and water productivity of wheat were achieved with 0.1% slope level with permanent brad bed and furrow method of irrigation.

- **Impact of tillage and relay cropping of berseem in pearl millet– mustard:** The cultivation practices of pearl millet (*Pennisetumglaucam*) – mustard (*Brassica juncea*) (P-M) in arid and semi-arid tropics of India has been showing signs of fatigue and productivity stagnating or decline trend from quite some times.In order to improve the productivity of the system and to make it profitable to farmers, it was considered necessary to diversify through legume crop based relay berseem (RB) cropping and shift of crop establishment practices from traditional to conservation agriculture (CA) based. CA-based crop establishment methods and RB crop treatments were significantly improved soil health compared with conventional till (CT) without RB crop. Compared to CT, the system productivity with treatments of CA based tillage and RB improvement by 12% compared to CT and RB, respectively. Adoption of CA

based tillage and relay berseem crop treatment saving production cost by 13,390 Rs. ha^{-1}, and gave additional net profit of 35,945 Rs. ha^{-1} compared with compared with CT and RB.The savings of total water use by 85 ha-mm, enhancing WP by 24%. In conclusion, crop establishment with CA based tillage and RB in mustard crop pearl millet based system best options for improving soil health, production of crops, economic profitability and water productivity

- **Assessment of soil water conservation techniques and cropping systems:** On Farm experiments in Chambal canal command areas of Morena district (2015 to 2019) showed that at head reaches pigeon pea – wheat followed by paddy – wheat; at mid reaches pigeon pea – wheat followed by cluster bean – wheat and at lower reaches cluster bean – barley followed by pearl millet – mustard and pearl millet – chickpea were the beneficial crop rotations. Impact of laser leveling on yield of crops was from 7.2 to 11.8% and increase in water productivity from 5.0 to 12.0%. Among irrigation method, broad bed and furrow was found best in terms of yield (7 to 21% in *Kharif* season crops and 5 to 13% in *Rabi* season crops), economic benefits and water productivity in all head, mid and lower reaches of canal command area in all crops except paddy.

- **Application of bio-formulations in *kharif* groundnut production**

The application of 75% recommended dose of NPK with biofertilizer (Liquid NPK + Zn solublizing bacteria) resulted in the highest pod yield (2738 kg/ha), haulm yield (7353 kg/ha), maximum net returns (87082 Rs/ha) and gross returns (122324 Rs/ha) of groundnut crop. But, it was statistically at par with 100% RDF application of NPK along with the biofertilizer (Liquid NPK + Zn solublizing bacteria). However, in terms of productivity and economics, application of 75% recommended dose of NPK with biofertilizer (Liquid NPK + Zn solublizing bacteria) resulted better.

- **Management of pearl millet blast :**

For the management of blast of pearl millet sixteen botanicals and cow urine were evaluated under *in vitro* condition. Among all the treatments, the cow urine absolutely inhibited the mycelia growth while, in botanicals the maximum growth was inhibited by *Azadirachta indica* (Neem Seed Kernel Extract). Further the effective fungicides, botanicals and cow urine were evaluated in the field. Trifloxystrobin + Tebuconazole @0.05% was found most effective against blast followed by propiconazole @ 0.05%, while among non-chemical treatments the cow urine @ 3

% and (Neem Seed Kernel Extract).@ 20% were found very effective for the organic management of blast.

- **Molecular characterization of *Pyricularia grisea* in Pearl Millet:**

  Eleven isolates of *Pyricularia grisea* were collected from blast infected pearl millet crop cultivated in five districts *viz.,* Morena, Bhind, Gwalior, Shivpuri and Sheopur of Madhya Pradesh to determine genetic diversity among the isolates. For the detection of molecular variability eight primers were shortlisted in the beginning of banding patterns by using DNA samples of pearl millet isolates. Among these markers, the sequence of three markers of URP showed polymorphic bands *viz.,* URP 30, URP 25 and URP 38. On the bases of electrophoretic banding pattern of SSR primers, pair wise genetic resemblance among eleven isolates was estimated and a dendrogram was generated using "Mega Software" (v2.3.3). Cluster analysis showed that accessions of *Pyricularia grisea* under study fell into two major group and their sub groups. Major group I, contains two Isolates *viz.,* PG-1 and PG-3 and major group II is divided into four sub groups, first sub group contains two isolates *viz.,* PG-5 and PG-8, sub group second and third having two isolates *viz.,* PG-9, PG-10 and PG-2, PG-4, respectively. Fourth sub group contain PG-6 and PG-7 isolates

URP - 25

URP - 30

URP – 38

Figure: Polymorphic Gel Picture

Figure: The diagrammatic representation of clusters based on primers

- **Integrated disease management through organic modules against root rot and foliar disease of Ashwagandha -** Integrated disease management through organic modules against root rot and foliar disease of Ashwagandha were evaluated at research field RVSKVV, College of Horticulture, Mandsaur. Among the seven treatments in integrated disease management modules against seedling rot and foliar disease, the treatment in furrow soil application of Neem cake mixture (100g/m^2) enriched with *Trichoderma + Pseudomonas* talc based formulation each @ 2.0% at sowing plus three foliar sprays of garlic bulb extract (w/v) @ 10 % recorded minimum disease incidence (18.84 %) and maximum dry root and seed yield (578.58 kg/ha and 376.16 kg/ha) followed by seed treatment with carbendazim + mancozeb 3 g /kg seed plus drenching and three foliar sprays with Tebuconazol 25 EC @ 0.1% at first initiation of disease followed by 15 days interval recorded minimum disease incidence (20.50 %) and dry root and seed yield (555.70 kg and 352.95 kg/ha) over control (42.84%, 234.34 kg and 186.22 kg/ha) respectively.
- The significantly highest pod (2789 kg/ha) and haulm yield (11111 kg/ha) of groundnut were recorded with application of pendimethalin 30EC + Imazethapyr 2 EC @ 1.0 kg/ha PE (ready mix) + quizafop – p- ethyl @ 50 g/ha at 15-20 DAS and was followed by Pendimethalin 30EC + Imazethapyr 2 EC @ 1.0 kg/ha PE (ready mix) + manual weeding at 25-30 DAS (2543 kg/ha & 7778 kg/ha) and Pendimethalin@ 0.75/1.0 kg/ha PE + manual weeding at 25-30 DAS (2475 kg/ha & 8862 kg/ha).

- The highest value of water productivity and weed control efficiency (WCE)in groundnut at 60 DAS was obtained with application of pendimethalin 30EC + Imazethapyr 2 EC @ 1.0 kg/ha PE (ready mix) + quizafop – p- ethyl @ 50 g/ha at 15-20 DAS (0.34 kg/m^3 and 98%) and was at par with Pendimethalin 30EC + Imazethapyr 2 EC @ 1.0 kg/ha PE (ready mix) + manual weeding at 25-30 DAS (0.31 kg/m^3 and 88.9%).
- The studies were conducted on Enhancing nitrogen use efficiency in Bt. Cotton. It could be concluded that the maximum seed cotton yield (1556.66Kg/ha) were found significantly under the application of 75% of RDN + placement (spot application in 4 splits: basal, squaring, flowering and boll development) + foliar application of 1% Urea (3 times: squaring, flowering and boll development) + raising of sun hemp between rows incorporated before flowering(T_7) which were 71.88 and 11.85% higher over control and 100% of RDN respectively, resulting into maximum boll weight, no. of bolls per square meter and higher the nitrogen use efficiency. The values of gross and net return as well as B-C ratio were maximum under the treatment (T_7).
- **Multi location evaluation of promising lines of Opium Poppy for higher yield and quality :** Seed yield (kg/ha) ranges from 1077 kg (UOP-79) to 1411 kg (UOP-20) as compared to check 1373 kg (JOP-540) during 2016-17 and 885 kg/ha (MOP 511) to 1193 kg/ha (JOP 540 during 2017-18 and 724.31 kg (Chetak Aphim) to 933.34 kg (MOP-278) during 2018-19. Over all mean seed yield ranges from 917.5 kg (UOP-79) to 1239.0 kg (UOP-30). The latex yield (kg/ha) ranges from 61 kg/ha (MOP-278) to 102 kg/ha (UOP-20) and 48 kg/ha (MOP-511) to 83 kg/ha) (UOP -80) during 2016-17 and 2017-18 and 53.64 kg, MOP-511 to 61.38 kg UOP-80 during 2018-19 respictively. Maximum latex yield recorded by entry UOP-20 (102 kg/ha) followed by chetak aphim (95 kg/ha), UOP-30 (83 kg/ha), UOP-80 (72 kg/ha), UOP-79 (69 kg/ha) and MOP-511 (67 kg/ha) as compaire to check MOP-540 (62 kg/ha) during 2016-17 where as during 2017-18 maximum latex yield recorded by entry UOP 80 (83 kg/ha) followed by Chetak Aphim (76 kg/ha) and UOP 19 (65 kg/ha). Morphine Content ranges from 10-4% (UOP-20) to maximum 12.8% (MOP-278) followed by MOP - 511 (12.6%) as compare to check JOP-540 (12.1%) during 2016-17 where as during 2017-18 it ranges from 11.7% (chetak aphim) to 13.4 (UOP 20) followed by 13.1% (MOP 278) as compaired to check 11.9% (Jop 540). During 2018-19 maximum latex yield 61.38 kg recorded by UOP-80, followed by 56.4 kg (MOP-

278) and 55.57 kg (UOP-79). Over all performance maximum latex yield recored by entry UOP-30, UOP-79, UOP 80 as compared to check where as maximum seed yield recorded by 1219.0 kg (UOP-30 kg) followed 1057.4 kg (MOP-278) 1016.4 kg (MOP-511). The entry UOP 30, MOP-278 and MOP-511 must be recommended for seed yield.

- **Effect of organic fertilizer, trichoderma, Neem Cake along with micronutrients on the growth and latex yield of opium poppy crop :** The result are found to be significant. The above table result reveal that the highest latex yield (69.0 kg/ha) recorded in T6 fallowed by T3 (66.0 kg). Under seed yield, highest seed yield recorded in T6 (17.0 q/ha). Treatment T6 recorded highest capsul (3.5) per plant as well as highest plant height (115 cm) recorded in the same treatment. The experiment concluded with the remark that the addition application of sulphure, zinc, boran, trichoderma, vermi compost along with RDF is required for the better latex and seed yield in opium poppy crop.

- **Performance of new wheat genotypes at different dates of sowing under irrigated conditions:** 25th November sown wheat crop produced the maximum yield (5726 kg/ha) which was significantly superior to other dates of sowing. On mean basis across sowing time, variety MACS 6222 produced the maximum and significantly higher grain yield (5434 kg/ha) followed by HS 562 (5274 kg/ha) and HI 1544 (5259 kg/ha).
- **Performance of new wheat genotypes at restricted irrigated conditions:** Two irrigations at CRI and boot leaf stage gave significantly higher grain yield in comparison to one and no irrigation. Check variety MP 3288 gave the highest yield (4030 kg/ha) followed by DDW 47 (3810 kg/ha) and HI 8627 (3633 kg/ha) when crop irrigated at CRI and late tillering stage.
- **Weed management in maize (sweet corn) under non-chemical cropping system:** Application of atrazine 750 g/ha as POE gave the maximum yield (7.31 t/ha) with B:C ratio 4.45. Although among the organic methods of weed control, intercropping (greengram with sweet corn) gave maximum corn yield (7.27 t/ha) *fb* hoeing at 20 & 40 DAS (6.44 t/ha). Among all non-chemical weed management practices the application of white and black plastic mulch was not economically feasible.
- **Weed management in potato under maize based non-chemical cropping system:** On the basis of results obtained from the experimental site, the treatment soil solarization with plastic mulch (25μ) resulted in better control of weeds with 88% efficiency of weed control. It resulted maximum tuber yield

(28.25 t/ha) fb soil solarization with one hand weeding at 40 DAS (26.00 t/ha) and also fetched maximum net returns Rs. 166933 with B:C ratio 2.44.

- **On Farm Research and demonstration of weed management technologies, their adaptation and Impact assessment:**

  i. **Wheat:** In the experiment of wheat it was concluded that application of sulfosulfuron + metsulfuron (30+2) g/ha PoE gave maximum yield (4.34 t/ha) *fb* clodinafop + metsulfuron (60+4) g/ha PoE (4.25 t/ha) in the farmers field, which was 29.89%, and 27.19% higher over farmer's practice (no herbicide applied) respectively. The B:C ratio was found 2.55 and 2.50 in these weed management practices as compared to 2.38 in farmer's field respectively.

  ii. **Pearlmillet:** It was observed that all the chemical weed management practices gave higher grain yield over farmers practice. The maximum yield of pearlmillet 2399.25 kg/ha was obtained with the application of atrazine 0.5 kg/ha + 2,4-D 0.5 kg/ha (PoE) *fb* pendimethalin 1.0 kg/ha (PE), which was 49.35%, and 41.49% higher than farmers practice respectively. The highest B:C ratio was also recorded with post emergence application of atrazine 0.5 kg/ha + 2,4-D 0.5 kg/ha (2.31).

  iii. **Blackgram:** In the experiment of blackgram, the maximum yield 888.25 kg/ha was recorded with the application of imazethapyr + imazamox (RM) 80 g/ha PoE *fb* pendimethalin + imazethapyr (RM) 750 g/ha PE, which was 43.44%, and 30.28% higher than farmer's practice respectively. The B:C ratio was also recorded highest with imazethapyr + imazamox (RM) 80 g/ha PoE (2.40).

- **Developing resource efficient and resilient rapeseed-mustard based cropping systems under the current and future climate :**Under Raised bed method of planting in kharif 2018-19 the Bajra, Maize, Soybean , Green gram, Sesame and Cluster bean occupied first position, producing maximum yield as 2611,2631, 1411, 891, 700 and 1647 kg/ha respectively. Similarly the Kharif crops namely Bajra ,Maize, Soybean ,Green gram , Sesame ,and Cluster-bean, occupied second position under conventional method of sowing which yielded 2436, 2560, 1240, 802, 574 and 1691 kg/ha respectively. In case of Zero tillage method of sowing during Kharif season the crop namely Pearl millet, Maize, Soybean, Green gram, Sesame and Cluster bean, occupied Third position for producing grain yield as 2142, 2560, 1241, 802, 574 and 1691 kg/ha respectively. The different method of sowing like Raised bed, conventional and zero tillage tasted for over all Kharif crops as mentioned above occupied I,II,III position for producing grain yield as 1648,1551 and 1217 kg/ha respectively. The Raised bed planting method tasted in Rabi 2018-19 for Indian mustard obtained first position for producing maximum seed yield as 2145 kg/ha which followed by conventional (1599 kg/ha) and Zero tillage method (1490 Kg/ha). The Green gram –Mustard cropping system was found as superior for producing Maximum seed yield of Mustard i.e. 1946 Kg/ha. which followed by Maize - Mustard (1873 kg/ha) and Soybean-mustard (1850 kg/ha). whereas the Pearlmillet –Mustard sequence was comparatively very poor which produced

minimum seed yield of 1258 kg/ha.The interaction Green gram –mustard X Raised bed planting recorded maximum seed yield of Mustard (2316 Kg /ha) and followed by Pearlmillet –Mustard X Raised bed planting (2222 kg/ha).

- **Studies on system of mustard intensification (SMI) in rapeseed mustard through transplanting:** The Species *Brassica carinata* (PC-6) recorded maximum seed yield of 3488 kgha^{-1} which closely followed by *Brassica juncea* (RH-749) yielded 3274 kgha$^{-1.}$ Whereas, the lowest seed yield (2874 kgha^{-1}) obtained with the species *Brassica napus* (GSC-7).The conventional planting method was found as the best for seed yield (3757 kgha-1) production which seconded (3086 kgha^{-1}) by the plot in which the crop transplanted at 45 x 45 cm row to row and plant to plant distance. Whereas the plot in which the crop transplanted at 60 x 60 cm row to row and palnt to plant distance produced minimum seed yield of 2794 kgha^{-1}. The interaction *Brassica juncea* (RH-749) X conventional planting 3941 kgha^{-1} was found as superior which closely followed by *Brassica carinata* (PC-6) X conventional planting 3889 kgha^{-1} from the seed yied point of view.

- **Effect of Land Configuration and Foliar Application of Nutrients for Yield Maximization in Black gram [*Vigna mungo (L.)* Hepper]:** Among the land configuration, raised bed method of sowing found significantly superior than flat bed sowing. It gave seed yield of 757 kg/ha. As regards nutrient management, application of NPK 18:18: 18 @ 2% spray gave seed yield of 679 kg /ha which is found significantly superior than the control (517 kg/ha).
- **Effect of fertilizer doses, organic manure and biofertilizer for yield maximization of urdbean and their effect on succeeding rabi crop:** Application of 125 % recommended dose of fertilizer gave significantly higher seed yielded 423 kg/ha found on par with 100 % % recommended dose of fertilizer than the 75 % RDF (380 kg/ha).Application of FYM @ 5 ton/ha gave significantly higher seed yield 616 kg/ha than no FYM application 594 kg/ha. Seed trearment with rhizobium + LMn 16 is better than the others.
- **Agronomic evaluation of AVT- 2 bold seeded lentil genotypes for high productivity :** The results indicated that the genotype LLSA-18-2 recorded significantly higher seed yield (1269 kg/ha) at par with LLSA 18-4 (1212 kg/ha) as compared to rest of genotypes. As regards dates of sowing, the first date i.e.14th Nov.2018 gave maximum seed yield (1294 kg/ha), found at par with second date of sowing i.e. 24th Nov. 2018
- **Survey and surveillance of major insect-pests of grape and their natural Enemies' status of new emerging insect pests of grapes and their natural enemies :** Survey of vineyards was carried out during 2018-2019 in Ratlam district of Madhya Pradesh.. Total 10 vineyards were surveyed for observing the prevalence of different insect pests' *viz.*, Mealybug (*Maconellicoccus hirsutus*),

thrips (*Rhipiphorothrips cruentatus*), flea beetle (*Scelodonta trigicollis*), mites (*Tetranichus urticae*), *Spodoptera* Sp., *Helicoverpa* Sp., and stem borer (*Coelosterna scabrator*). It was observed that out of 10 vineyards surveyed, 6 vineyards (60.00%) were found infested with mealy bug, and but all vineyards having low level of infestation. Infestation of Thrips was recorded in all 10 vineyards and but the infestation level was low in 6 vineyards (60.00%) while moderate in 4 vineyards (40.00%). The infestation of flea beetle was low to moderate and recorded in 2 vineyards (20.00 %) only. The infestation of stem borer was recorded in 5 vineyards (50.00 %). *Spodoptera* was observed only in one vineyard (10.00%) during the period. There was no recorded infestation of *Helicoverpa* and mite during the period under report. Survey indicates that the thrips, stem borer were the major pests in Ratlam and Mandsaur district which leads to weathering the vineyards.

- **Validation of online interactive weather information based disease and insect pest risk assessment in Grape :** After the foundation pruning incidence of powdery mildew was not observed in advisory plot and farmers practice plot. Similarly incidence of downy mildew was also not observed in the range in advisory plot and farmers practice plot. However, after the fruit pruning incidence of powdery mildew was observed in the range of 0 to 38.37 per cent in advisory plot, while 0 to 21 percent incidence seen in farmers practice plot. The incidence of downy mildew was observed Nil in advisory plot and farmers practice plot. In online advisory plot total three sprays done for management of powdery mildew and three sprays for downy mildew during the season. In Farmers practice, they applied total five sprays for management of powdery mildew and three sprays for management of downy mildew during the season. The results indicate that there was saving of two sprays for powdery during the period of report by the use of online advisory as compared to farmers practices with reduction in disease intensity. In case of yield parameter AWS plot with less chemical spry also give yield equal to famer practice.
- **Catchments–Storage Command Relationship for Enhancing Water Productivity in Micro –watershed:** An experimentfor enhancing water productivity in micro –watershed,Soybean, Hy.maize were sown in *Kharif* season.Whereas, Chickpea, Sweet corn for green cobs, Potato and onion were planted in *Rabi* season.Among the different models, Hy.Maize– Sweet corn (Green cob) found the more remunerative as it recorded total net returns Rs.75426/- per hectare with B: C ratio 4.35 followed by sequentially grown Hy.Maize-Chickpea- (Rs. 50303/- with B: C ratio 3.97), Soybean –Onion (Rs. 53532/- with B: C ratio 3.29) and soybean – Chicpea(Rs. 31414/- with B: C ratio 3.03).The soybean- Potato recorded lowest net return Rs. 36302/- with B: C ratio

2.53.The sweet corn (Suger-75)for green cobs,Onion, Potato and chickpea were sown in *rabi* season. Result revealed that sweet corn (Suger-75) for green cobs recorded highest net return Rs. 84184/- followed by onion Rs. 78175/- and potato Rs. 43714/- (B: C ratio 2.62) whereas lowest was recorded by chickpea Rs. 33939/- per ha with higher B: C ratio of 3.61.

- **Evaluation of different soybean based cropping sequences in *Vertisols:*** Three crop sequences **Soybean**- Chickpea/Safflower/Mustard, Maize-Chickpea/Safflower/Mustard and Black gram- Chickpea/Safflower/Mustard were grown under rainfed condition. Result showed that Hy. Maize (Done 1588) recorded highest seed yield (4545 kg/ha) followed by soybean (JS 20-34) and black gram (848 kg/ha). During *rabi*chickpea (RVG 202) produced higher seed yield 1667, 1625 and 1500 kg/ha grown after soybean, black gram and maize, respectively. Where as, the higher seed yield of safflower 800 kg/ha grown after black gram followed by 750 and 708 kg/ha recorded after maize and soybean. The data indicated that crop sequence Maize -Chickpea found more remunerative as recorded highest total return Rs.150900/- with B: C ratio of 4.31 followed by Maize – safflower (Rs.93400/- with B: C ratio of 3.67), soybean – chickpea (Rs.82605/- with B: C ratio of 3.36) and black gram – chickpea (Rs.80880/- with B: C ratio of 3.31). Whereas, lowest return Rs.51325/- with B: C ratio of 2.47 recorded by sequence soybean- safflower. Mustard not germinated due to poor moisture condition.
- **Long Term Manurial Trial in *Vertisols:*** Based on the average of last 27 years, treatments T_6 (FYM 6 t ha-1 + N20 P13) gave highest seed yield of 1905 kg ha^{-1} was found significantly superior with regards to seed productivity however, treatment T6 was found superior to rest of the treatments with regards to improvement in physical and chemical properties of the soil. The treatment T_1*i.e.,* control was found statistically inferior to all the treatments in respect of yield and fertility status. Organic matter decomposition has indicated the advantage of recycling organic matter and nutrients from farmyard manure. The organic matter contained in them influence the physical, chemical and biological properties of the soil. These studies clearly indicate that a part of the inorganics can be substituted, thus substantially cutting the cost of cultivation. These sources need to be tapped in future as alternatives for deriving nutrients and improving soil health.
- **Satellite experiment on effect of integrated nutrient management (INM) in soybean-chickpea system *:*** Results revealed that, during year 2018-19 the soybean variety of JS 95-60 produced higher yield (1600 kg ha^{-1})with FYM 6 tkg ha^{-1} + N20P13as compared to convention practice (1500 kg ha^{-1}). Almost similar resultswere observed in case of soybean straw yield. Economic analysis revealed that the highest net return of Rs. 40300 ha^{-1} was obtained in treatment FYM 6 t kg ha^{-1} + N20P13 and Rs. 40300 ha^{-1}38700 $ha^{-1}$with conventional practice.The highest B:C ratio of 1.97 was obtained withbalance fertilization. Rain water use

efficiency by soybean crop varied from 2.40 kg $ha^{-1}mm^{-1}$ (Convention practice) to 2.56 kg ha^{-1} mm^{-1} (FYM 6 t kg ha^{-1} + N20P13) respectively.

- **Sorghum :** The crop was sown during first week of July 2018 as per the protocol. Performance wise except few lines overall germination was uniform ranged from 80 to 95 percent, shoot fly caused damaged to the genotypes at 21 DAE which was more or less remained same up to 28 DAE .The mortality of the crop plants was observed in some of the replications due to weed flora. This year sucking pest infestation on crop ,Panicle damage caused due to lepidopteron and sap sucking pestswas also at lower population .The overall crop growth was quite satisfactory. Genotypes performed better in their categories in keeping lower shoot fly, stem borer dead hearts and lower panicle damage, among the test varieties and hybrid genotypes .The resistant checks showed their superiority in keeping less pest infestation with comparatively higher yields obtained from them. The maximum shoot and panicle pest damage was observed in susceptible checks. In case of seed treatment trial , Seed treated with Thiamethoxam 30 FS@ 10 ml/kg+ soil application of carbofuran 3G @ 8 kg/ ha. at 30 DAE. Sorghum seed treated with fipronil 5 SC @5ml/kg+ Sorghum seed treated with Imidacloprid 70 WS @ 3g/ kg of. Sorghum seed treated with Acetamipride 20SP @5ml.kg.(18gram/plot)over sorghum crop without any application (Control).

- **Assessing pre and post canal irrigation effect on soil, water and crops in Vertisols of Narmada Sagar Command:**

  Background: Degradation of soil physical and chemical environment is a serious problem in command areas of the country. It is conjectured that due to improper management of irrigation, every year as much area goes out of cultivation as is brought under irrigation. The inherent soil characteristics, climate, topographical features and manmade activities of irrigation independently or jointly give rise to problem of soil degradation and ultimately loss of production. Irrigation thus becomes curse when problem of soil degradation starts. The peninsular India particularly Deccan Plateau is by and large characterized by the presence of Vertisols and associated soils stretched over 22.9 million hectares out of which 2.3 million hectares are in Madhya Pradesh. The major irrigation project of Madhya Pradesh viz. Tawa, Barna, Bargi, and Halali etc. are predominantly having black soil group. Black soils are rated as problem soil for farming because they are difficult to work with when either too dry or too wet. They are characterized by low infiltration, slow water transmission within soil profile and prone to chemical degradation under impeded drainage conditions. Commissioning of canal irrigation can solve the problem of dryness; however problem of wetness also needs to be anticipated at the same time. The problem of wetness was not anticipated in Tawa and Barna command as a result of which area has started observing problem of water table and salt build up. Kool (1998) reported area of 1250 ha and 7500 ha under water table range of 0-1 m and 1-3

m water table depth range in Barana Command. Singh (1992) reported an area of 6600 ha affected with salinity problem in Tawa Command. Irrigation in Indira Sagar Command (ISC) of Narmada Sagar command has yet to start in a year or two after completion of canal network. As this is the right time to start monitoring physico-chemical properties, ground water fluctuation, crop productivity and hydrologic characteristics to have a suitable data base for comparison in future. In general the soils of Indira valley of Madhya Pradesh are medium to deep and having alkaline elements. Introduction of canal irrigation is a latest development in this area; as such proposed study will lead to generate database on impact of irrigation project on soil, water and crop to plan strategies for enhancing production on sustainable basis in this region.

- **Technique :** Pre and post monsoon water tables were recorded in 13 Nos. wells situated in head reach of ISC during the pre canal irrigation period (2005 and 2012) and post canal irrigation period (2015 and 2019) and same were used to calculate the year wise WT fluctuations for the comparison. The data on area under various *kharif* and *rabi* crops along with their productivity of Khandwa district were collected for the pre canal irrigation period. The collected data of pre canal irrigation period on productivity of various *kharif* and *rabi* crops was statistically analyzed for calculating Sustainability yield Index (SDI) during the year 2015-16. The SYI (Singh *et. al.* 1990) was calculated based on yield equivalents like average yield, standard deviation and maximum yield over the years.

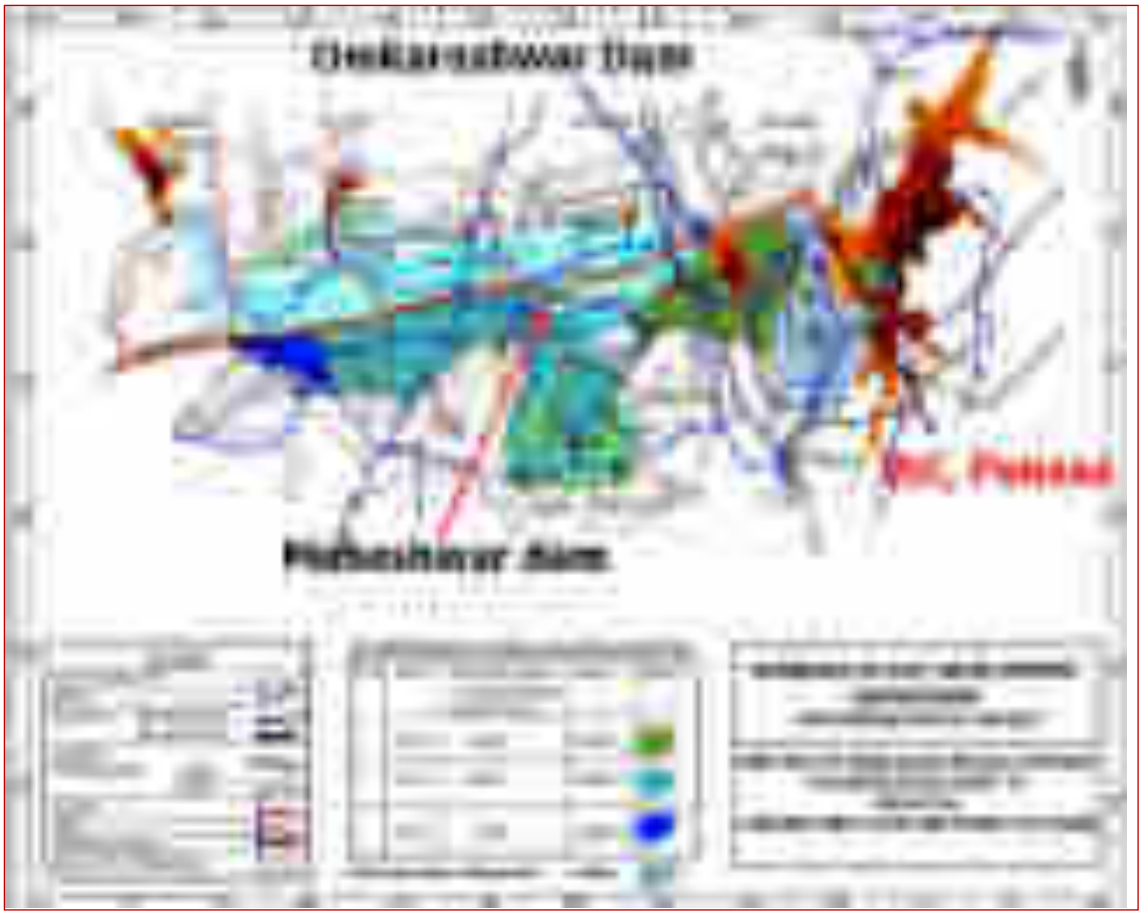


Fig. Pre and post canal irrigation area of Narmada Sagar Command

Water table fluctuations

Water tables were recorded in 13 Nos. wells situated in head reach of Indira Sagar Command (ISC) during the pre canal irrigation period (2005 and 2012) and post canal irrigation period (2015 and 2019) as shown in Table 01. The average fluctuation of pre and post water table depths of 13 wells during pre canal irrigation period 2005 and 2012 were 4.21 m and 2.29 m respectively. Although, irrigation was not commissioned in the year 2012 yet there was huge impounding behind the dam and water was allowed to flow in the canal distribution system. After commissioning of canal irrigation system in head reaches the average water table fluctuation were around 1.53 and 1.34 m during 2015 & 2019 indicating rise of water table in the area.

Table 01. Water Table fluctuations recorded during pre and post canal irrigation period in head reaches of Indira Sagar Command

Well No.	Depth (m)	Latitude	Longitude	Water Table, m											
				2005			2012			2015			2019		
				Pre	Post	Fluctuation	Pre	Post	Fluctuation	Pre	Post	Fluctuation	Pre	Post	Fluctuation

1	09.60	22⁰09’06.5”	76⁰17’59.6”	8.00	5.20	2.80	5.90	1.00	4.90	5.20	3.15	2.05	4.8	3.1	1.7
2	13.00	22⁰09’08.9”	76⁰18’18.0”	11.00	6.70	4.30	10.00	5.40	4.60	4.90	3.50	1.40	3.0	1.1	1.9
3	12.00	22⁰08’38.5”	76⁰18’48.9”	10.00	5.40	4.60	7.00	3.70	3.30	2.45	2.40	0.05	2.9	2.7	0.2
4	10.55	22⁰07’4.2”	76⁰20’4.3”	8.80	4.60	4.20	4.10	0.90	3.20	4.40	3.00	1.40	4.1	3.8	0.3
5	08.70	22⁰7’44.2”	76⁰20’2.9”	8.70	3.80	4.90	3.90	1.40	2.50	4.75	4.50	0.25	2.7	0.8	1.9
6	09.00	22⁰07’4.2”	76⁰20’9.0”	9.00	3.90	5.10	4.10	2.80	1.30	5.00	2.00	3.00	3.1	0.7	2.4
7	09.50	22⁰07’1.5”	76⁰19’0.0”	8.50	6.00	2.50	5.80	3.90	1.90	6.15	4.00	2.15	4.6	2.1	2.5
8	09.50	22⁰08’0.5”	76⁰19’4.0”	9.05	4.75	4.30	1.50	1.00	0.50	3.70	1.40	2.30	3.4	2.7	0.7
9	11.00	22⁰4’25.0”	76⁰18’23.7”	9.00	5.70	3.30	5.20	3.40	1.80	3.50	2.20	1.30	2.2	2.0	0.2
10	11.00	22⁰2’05.1”	76⁰16’23.2”	9.20	5.90	3.30	5.20	3.80	1.40	5.00	3.30	1.70	4.9	4.1	0.8
11	10.00	22⁰2’40.8”	76⁰16’4.8”	8.70	4.90	3.80	1.00	1.00	0.00	6.70	4.20	2.50	5.4	3.0	2.4
12	09.00	22⁰3’47.6”	76⁰15’8.4”	8.00	2.90	5.10	6.50	2.80	3.70	4.20	3.30	0.90	3.5	2.2	1.3
13	09.00	22⁰8’10.3”	76⁰9’44.7”	9.00	2.50	6.50	5.00	4.30	0.70	2.40	1.50	0.90	2.3	1.1	1.2
Average of WT fluctuation						**4.21**			**2.29**			**1.53**			**1.34**

Water quality of canal water

Water samples collected during post irrigation period (2015-16 and 2018-19) from main canal, Kelwa distributary, minor and sub- minor which were analyzed for pH, EC, water soluble anions and cations (Table 02. The estimated values of pH, EC, SAR and RSC were found in the range of 7.21 to 7.40, 0.36 to 0.39 dS/m, 0.82 to 0.95 and Nil respectively during pre canal irrigation period (2012-13). Estimated values of pH, EC, SAR and RSC are found in the range of 7.31 to 7.42, 0.38 to 0.68 dSm^{-1}, 0.77 to 0.88 and Nil respectively during post canal irrigation period (2018-19). The values of water quality parameters clearly indicate that waters are of good quality for irrigation.

Table 10. Water quality of canal water

Water Quality	2012-13	2018-19
pH	7.21-7.40	7.31-7.42
EC (dSm^{-1})	0.36-0.39	0.38-0.68
SAR	0.82-0.95	0.77-0.89
RSC (me L^{-1})	Nil	Nil

Soil properties around main canal

Surface and subsurface soil samples were collected during post irrigation period (2018-19) around main canal with the distance of 1, 2, 3, and 5 km. The samples were anlysed for EC, pH and organic carbon content (Table 03). Soil pH, Ec and OC ranged from 7.40 - 7.79, 0.18-0.36 dSm^{-1} and 0.28-0.65% respectively in surface and subsurface samples. The surface soil samples depicted higher pH, EC and OC content.

Table 03: Soil properties around main canal

Distance from Main canal	Depth (cm)	pH	EC (dSm^{-1})	OC (%)
1 KM	0-30	7.53	0.20	0.53
	30-60	7.40	0.18	0.44
2 KM	0-30	7.39	0.26	0.29
	30-60	7.38	0.21	0.28
3 KM	0-30	7.79	0.32	0.50
	30-60	7.64	0.28	0.47
5 KM	0-30	7.61	0.36	0.65
	30-60	7.41	0.24	0.60

Breeder seed production *Rabi*-2018-19: A quantity of 5353.20 quintals of breeder seed of various crops namely Wheat, Gram, Lentil, Pea, Rapeseed & mustard and Toria produced during Rabi 2018-19.

S. No.	Crops	Production (qt)
1.	Wheat	2153.00
2.	Gram	3037.00
3.	Lentil	13.60
4.	Pea	72.40
5.	Rapeseed & mustard	42.70
6.	Toria	34.50
Total		**5353.20**

- **Breeder seed production *Kharif* -2019:** A quantity of 2583.70 quintals of breeder seed produced of various crops namely Soybean, Sorghum, Green Gram, Black Gram and til produced during Kharif 2019.

S. No.	Crops	Production (qt)
1.	Soybean	2408.00
2.	Green Gram	31.01
3.	Black Gram	25.65
4.	seas am	11.90
5.	Sorghum	2.14
6.	Paddy	105.00
Total		2583.70

- **Organized Meetings/ Workshops /Seminar etc:-**

S.N.	Date	Place	Description	Photograph
1	6/2/2019 to 3/3/2019	College of Horticulture, Mandsaur	Skill Development training programme on Nursery worker conducted form 6/03/2019 to 3/03/2019 at College of Horticulture funded by Agriculture Skill council of India (ASCI). Total 20 candidates participated in this training programme.The training was conducted as per the norms and guideline of ASCI. The main objective of training was improve the skill the as nursery worker and teach the different	

			nursery work like grafting, budding, nursery bad preparation, safety majors in work place etc.	
2.	May 29-30, 2019	Directorate of Research Services, RVSKVV, Gwalior	Annual Farm Review Meeting of Seed Production Programme 2018-19 and Planning for Kharif 2019. Total number of 70 Scientists, officer Incharge Farms and Breeders of the University attend the Meeting	
3.	June 10, 2019	Directorate of Research Services, RVSKVV, Gwalior	Review meeting of the revolving fundto review the physical & financial progress of revolving funds for PHM Unit /Soil testing/ Dairy/vermi-compost/ Herbal Garden	
4.	June 11, 2019	Directorate of Research Services, RVSKVV, Gwalior	Review meeting of the seed Hub/EBSP Project to review the physical, technical & financial progress of the seed hub & EBSP project	

- **Distinguished Visitors:**

S.N.	Prominent Visitors	Date	Institute/organization	Place of visit description
1.	Dr P.K.Rai, Director	26/10/2019	Directorate of Rapeseed& Mustard, Bharatpur (Raj.)	ZARS, Research field, Morena (M.P.)
2.	Dr P.K.Rai, Director	07/12/2019	Directorate of Rapeseed & Mustard, Bharatpur (Raj.)	ZARS, Research field, Morena (M.P.)
3.	Hon'ble , Shri Narendra Singh Tomar Minister of Agriculture and Farmer Welfare, Rural Development and Panchayat Raj,	17/09/2019	Government of India	ZARS, Research field, Morena (M.P.)

4	Hon'ble Shri Sachin Subash Yadav Minister of Farmers Welfare and Agricultural Development Department, Department of Horticulture and Food Processing Department	04.09.2019	Govt. of M.P. Bhopal	Visited AICRP-Chickpea Centre and viewed ongoing research activities of the Centre.
5	Dr. Radha krishnan T, Director	16.08.2019	ICAR-DGR, Junagadh	Field of Ag. Research farm (AICRP-WM) COA Gwalior
6.	Dr Hariprasanna Dr SS Rao Dr Shyam Prasad	11.10.19	IIMR, Hyderabad	Monitoring of Sorghum Research work, Indore & Farmers Fields at Manpur, Mamdav & other tribal villages of Dharampuri block of Dhar District

Text/Reference Books:

S.No.	Author(s)	Book Name	Year	ISBN No.
1	Ranade D.H., Jadav, M.L., Swarup Indu, Girothia, O.P., Bhagat, D.V., Singh Akhilesh and Choudhary Sharad	Rainwater management in rainfed areas.	2019	978-81-7622-458-1
2	Ranade D.H., Jadav, M.L., Swarup Indu, Girothia, O.P., Bhagat, D.V., Choudhary, S.K. and Upadhyaya, Ashish	Apvahit versha jal akatrikaran v sanchit jal ka upyog.	2019	978-81-7622-464-2
3	Reeti Singh, Rajni Singh Sasode, Ajay Kumar, Pragati Saini, R.K. Pandya, Ashish Bobade, Radha Gupta and J.K. Patidar	Hand book of fungi	2019	-

Technical bulletin

S.N.	Author (s)	Title	Year	ISBN No./Ref. No.
1	Joshi Ekta, Sikarwar RS, Sasode D.S, Sasode R.S, Kasana BS, Tiwari Sushma and Gupta Varsha	*Moongfali fasal utpaadan ki unnat taqniq*	(**2019)**.	

MoUs Signed:

- MoU signed on 26.11.2019 for Developing Agro Business Incubator to establish the criteria under which ABVIIITM and **RVSKVV** will carry out joint collaborative activities to create an Agro Business Incubator at ABVIIITM, Gwalior for promoting mutual cooperation in education, research and outreach with RVSKVV, Gwalior
- A partnership agreement between ICRISAT and RVSKVV for the project entitled "Delivering more produce and income to farmers through enhancing genetic gains for chickpea and pigeonpea"
- Signed the MoU on 05.09.2019 for Collaborative Research with RVSKVV, Gwalior with Bhabha Atomic Research Centre (BARC), Trombay, Mumbai, Maharashtra
- Sign the MoU on 02.09.2019 for facilitating Research and Extension work with KAMATAN FARM TECH Pvt Ltd, New Delhi & Madhya Bharat Consortium of farmer producer Company Ltd, Bhopal

- **Research Publications in referred journal**

S. No.	Author (s)	Title	Journal	Vol.	Page No.	Year	NASS Rating
1	Ranade D.H., Jadav, M.L., Swarup Indu, Bhagat, D.V. and Girothia, O.P	Effectiveness and utility of in Malwa and Ninar region.	Indian farming	69(07)	25-27	2019	-
2	Ranade, D.H., Jadav, M.L., Swarup, Indu, Upadhyaya A., Bhagat, D.V. and Girothia, O.P.	Enhancing crop productivity through water harvesting tank under changing climatic conditions	Int. J. Agril. Sciences.	Vol 11(16) :.	8885 - 8887	2019	4.82
3	Ranade, D.H., Jadav, M.L., Swarup, Indu, Upadhyaya A., Bhagat, D.V. and Girothia, O.P.	Innovative and modified ridge – furrow irrigation system in malwa region.	Int. J. Agril. Sciences	Vol 11(15)	8880 - 8889 .	2019	4.82
4	Ranade, D.H., Jadav, M.L., Swarup, Indu, Bhagat, D.V. and Girothia, O.P.	Innovative and modified ridge – furrow irrigation system in malwa region	Indian Farming	69(7):	25-27	2019	4.82
5	Narendra Singh, N.S. Bhadauria, Pradyumn Singh	Bioefficacy of plant extracts against Mustard aphid and their natural enemies	Flora and Fauna	25 (1)	31-33	2019	4.55
6	Bharat Lal, NS Bhadauria, Pradyumn Singh	Seasonal Incidence of sucking insect pest in brinjal and their natural enemies in Gird region of Madhya Pradesh, India	Journal of Pharmacognosy and Phytochemistry	Vol. 8, Issue 4 , Part AI	2077 - 2079	2019	5.21
7	Narendra Singh, N.S. Bhadauria, Pradyumn Singh	Bioefficacy of plant extracts against Mustard aphid and their natural enemies	Flora and Fauna	25 (1)	31-33	2019	4.55
8	Bharat Lal, NS Bhadauria, Pradyumn Singh	Seasonal Incidence of sucking insect pest in brinjal and their natural enemies in Gird	Journal of Pharmacognosy and Phytochemistry	Vol. 8, Issue 4 , Part AI	2077 - 2079	2019	5.21

		region of Madhya Pradesh, India					
9	Sasode D S, Joshi Ekta, Jinger Dinesh, Gupta Varsha and Singh Y. K.	Conservation tillage and integrated weed management effects on weed supression, productivity and profitability of cowpea *(Vigna unguiculata*)	*Indian Journal of Agricultural Sciences*	Accepted: 03 July 2019.	-	2019	6.23
10	Gupta Varsha, Sasode D S, Joshi Ekta and Kasana B.S.	Conservation tillage and integrated weed management effects on weed supression, productivity and profitability of cowpea *(Vigna unguiculata*)	*Indian Journal of Agricultural Sciences*	Accepted: 25 October 2019. File no 84662	-	2019	6.23
11	Gupta Varsha, Joshi Ekta, Sasode D S, Singh Lakhan, Kasana B S and Singh Y K	The Effect of chemical and non-chemical control methods on weeds and yield in potato (*Solanum tuberosum* L.) cultivation under potato based organic cropping system.	*International Journal of Current Microbiology and Applied Sciences.*	8(7)	2737-2747	2019	5.38
12	Gupta Varsha, Sharma S, Sasode D S, Joshi Ekta, Kasana B S and Joshi Neeshu	Efficacy of herbicides on weeds and yield of greengram.	*Indian Journal of Weed Science*	51(3)	262-265	2019	5.17
13	Joshi Neeshu, Gupta Varsha, Joshi Shourabh and Parewa H P	Biochar: A Way to combat climate change by improving soil health.	*Indian Journal of Plant and Soil*.	6(2)	109-115	2019	3.07
14	V.P.S. Bhadauria, Varsha Gupta and F.M. Prasad	Effect on growth parameters and oil content of lemongrass with respect to iron pyrite under and continuous use of	*Journal of Plant Development Sciences*	11(1)	57-60	2019	4.57

		rsc rich irrigation water.					
15	Kushwah, G.; Sharma, R. K.; Kushwah, S. S. and Mishra, S.	Effect of organic manures, inorganic fertilizers and varieties on growth, yield and quality of tropical carrot	*Indian J. Hort*	76(3)	451-456	2019	6.10

- **Research Publications in referred journal**

S. No.	Author (s)	Title	Journal	Volu.	Page No.	Year	NASS Rating	JID	ISSN	National / International
1.	Pandey G.P., Khandkar U.R., Tiwari S.C. and Kumawat N.	Response of different levels of nitrogen on wheat yield when cultivated on sodic vertisols soils.	*Indian Journal of Soil Salinity and Water Quality*	10 (2)	254-258	2018	4.94	J472	0976-0806	National
2.	Kumawat N., Yadav R.K., BangarK. S., TiwariS.C., Morya J. and KumarR	Studies on Integrated Weed Management Practices in Maize:	Agricultural Reviews	40 (1)	29-36	2019	4.38	A092	0976-0539	National
3	Nitin Soni, Prakash Patil, K.C. Meena, Ajay Haldar*, Dharmendra K. Patidar and Rajesh Tiwari	Evaluation of Different Coloured Varieties of Grapes under Nontraditional Area of Malwa Plateau: A Thin Line Tool for	International Journal of Current Microbiology	Volume 8 Number 03	1968-1976	(2019)	5.38	I199	2319-7706	International

		Doubling the Farmer Income								
4	V K Tiwari	Morphological parameters in breeding for higher seed yield in Indian mustard [*Brassica juncea*	(L.) Czern. & Coss.] EJPB	Vol.10 (1)	p187-195	2019	4.97			National
5	Ekta Joshi, D.S. Sasode, R.S. Sikarwar, Varsha Gupta and B.S. Kasana	Optimizing crop geometry and nutrient management for yield, water productivity and economics of *kharif* groundnut (*Arachis hypogaea* L.).	*Legume Research*				6.23	L010	ISSN 0976-0571	National
6.	Singh Neelam, Joshi Ekta, Sasode D.S, Sikarwar, R.S. and Rawat, G.S.	Liquid Biofertilizer and inorganic nutrients effect on physiological, quality parameters and productivity of kharif Groundnut	*.International Journal ofCurrent Microbiology and Applied Sciences*	Vol. 7 (09	729-735		5.38	I199	ISSN : 2319-7706	

4.9 Activities of Seed Production Farms:

RVSKVV is also making sincere efforts to generate cutting edge technology for enhancing crop productivity. Thrust is also farm seed replacement in the state by producing quality seeds of important crops. It is worthwhile to mention that RVSKVV has produce 9911.40 q **seeds** with different crops during 2019-20 which helped the farmers in a big way for seed replacement and thereby enhancing the productivity of crops.

The seed activities in the University are managed with the help of twenty seven seed farms, which are located in twenty four districts and six agro-climatic zones of Madhya Pradesh. Out of the total farm area of 1210.85 ha., only 64.45 % (780.3 ha.) is under cultivation. Among the cultivated area 13.39 % and 34.59 % is irrigated and partially irrigated, respectively. Rest of the cultivated area is under rainfed farming.

The area under plantation crop is about 82.02 ha. Rests of the farm area is fallow or pasture land or occupied by road and buildings.

Breeder seed produced in Kharif and Rabi crops:

S. No.	Crops	Qty. (q.)
(A) Kharif crops		
1.	Soybean	3289.0
2.	Green gram	115.5
3.	Black Gram	52.7
4.	Pearl Millet	0.0
5.	Sorghum	16.3
6.	Ground Nut	0.0
7.	Pigeon Pea	0.0
8.	Paddy	130.20
9.	Til	0.0
Total (A)		**3603.70**
(B) Rabi crops		
1.	Wheat	2669.0
2.	Gram	3545.0
3.	Lentil	2.70
	Pea	50.0
4.	Rapeseed and Mustard	41.0
	Safflower	0.0
	Maize	0.0
Total (B)		**6307.70**
Grand Total (A+B)		**9911.40**

5. EXTENSION ACTIVITIES:

RVSKVV, Gwalior has 27 Krishi Vigyan Kendras (KVKs) under its jurisdiction established with the financial support of ICAR. Out of which, 22 are under the administrative control of the University and five under NGOs/ICAR institute, which are functioning under technical guidance of Directorate of Extension Services of the University. The Directorate is committed to serve the farmers through its well organized network of Krishi Vigyan Kendras, which play a vital role in dissemination and transfer of recent emanated research technologies in agriculture, horticulture, livestock production and allied fields.

The KVKs are assessing the technological needs of the farmers of the districts and revalidating the technology for adoption through On Farm Testing. The KVKs are disseminating technologies and strengthening the farmers through, Front Line Demonstrations, Training Programmes for Farmers and Farm Women, Extension functionaries and Vocational Training for Rural Youth and other regular Extension Activities in selected villages of the concerned district. Thus, they contribute in minimizing the gap between prevailing farmers' yield and production potential in specific area.

Mission

Directorate of Extension Services is committed to serve the farmers andto achieve the motto of the University, which isto reach the un-reached through its extension system. The main objectives of the Directorate are:

1. Transfer of technology, assessment, application, refinement and providing feedback to the researchers.
2. Up gradation of knowledge and skill of extension functionaries as well as farming community.
3. Development and dissemination of technology through print and electronic media for mass reach.
4. Catering the needs of farming communities through single window system.
5. Linkage with line departments, concerned institutions and NGOs.
6. Reviewing the activities of KVKs and technological backstopping of KVK scientists and help in formulating action plan.
7. Popularization of low draft improved agricultural implements.

Krishi Vigyan Kendras

Twenty two Krishi Vigyan Kendras of RVSKVV are located at the districts of Agar-Malwa, Alirajpur, Ashok Nagar, Badwani, Bhind (Lahar), Datia, Dewas, Dhar, Dhar II (Manawar), Guna (Aron), Gwalior, Jhabua, Khandwa, Khargone, Mandsaur, Morena, Neemuch, Rajgarh, Shajapur, Sheopur, Shivpuri and Ujjain. KVK Bhopal is working under administrative control of ICAR-CIAE and KVKs in districts Indore, Sehore, Ratlam and Burhanpur are working under the aegis of reputed NGOs, with technical backstopping of RVSKVV. KVKs facilitate the process of assessment of technology through OFT, skill upgradation through training programmes, and technology dissemination through method and result demonstrations, Kisan Melas, Seminars and mass campaigns etc.

Agro-climatic Zone wise Location of KVKs

Agro-climatic Zone	Features	District / KVK's under the Zone
Gird Zone	Semi-arid climate, situated between 152-224msl, annual rainfall 566-977 mm and soils are Alluvial medium black, mixed red black and red yellow in colour.	Sheopur, Morena, Bhind, Gwalior, Shivpuri (Partial), Guna (Partial) and Ashok Nagar
Bundelkhand	High temperature, situated between 266-560msl, annual rainfall 750-1200mm with shallow clayey loam soil	Datia, Shivpuri (Partial)
Malwa Plateau	Semi-arid climate, situated between 450-675 msl , annual rainfall 800-1200mm, soil is medium to deep black (vertisol)	Neemuch, Mandsaur, Ujjain, Shajapur, Rajgarh, Dewas and Dhar (Partial), Indore Ratlam and Agar-Malwa
Jhabua Hills	Undulated topography, situated between 450-700 msl, erratic rainfall (600-800mm) and shallow to medium skeletal gravely soil	Alirajpur, Jhabua and Dhar (Partial)
Nimar Valley	Hot and dry weather, situated between 450-700 msl, less annual rainfall (600-800mm), soil is deep black clayey (vertisol)	Badwani, Khargone, Khandwa, Burhanpur
Vindhyan Plateau	Hot humid climate, undulated topography, situated between 350-600 msl, annual rainfall, 1000-1200mm and medium black soil.	Guna (Partial), Bhopal, Sehore

Mandate of KVK:

The major mandate of KVKs is the assessment, refinement and demonstration of technology/ products.

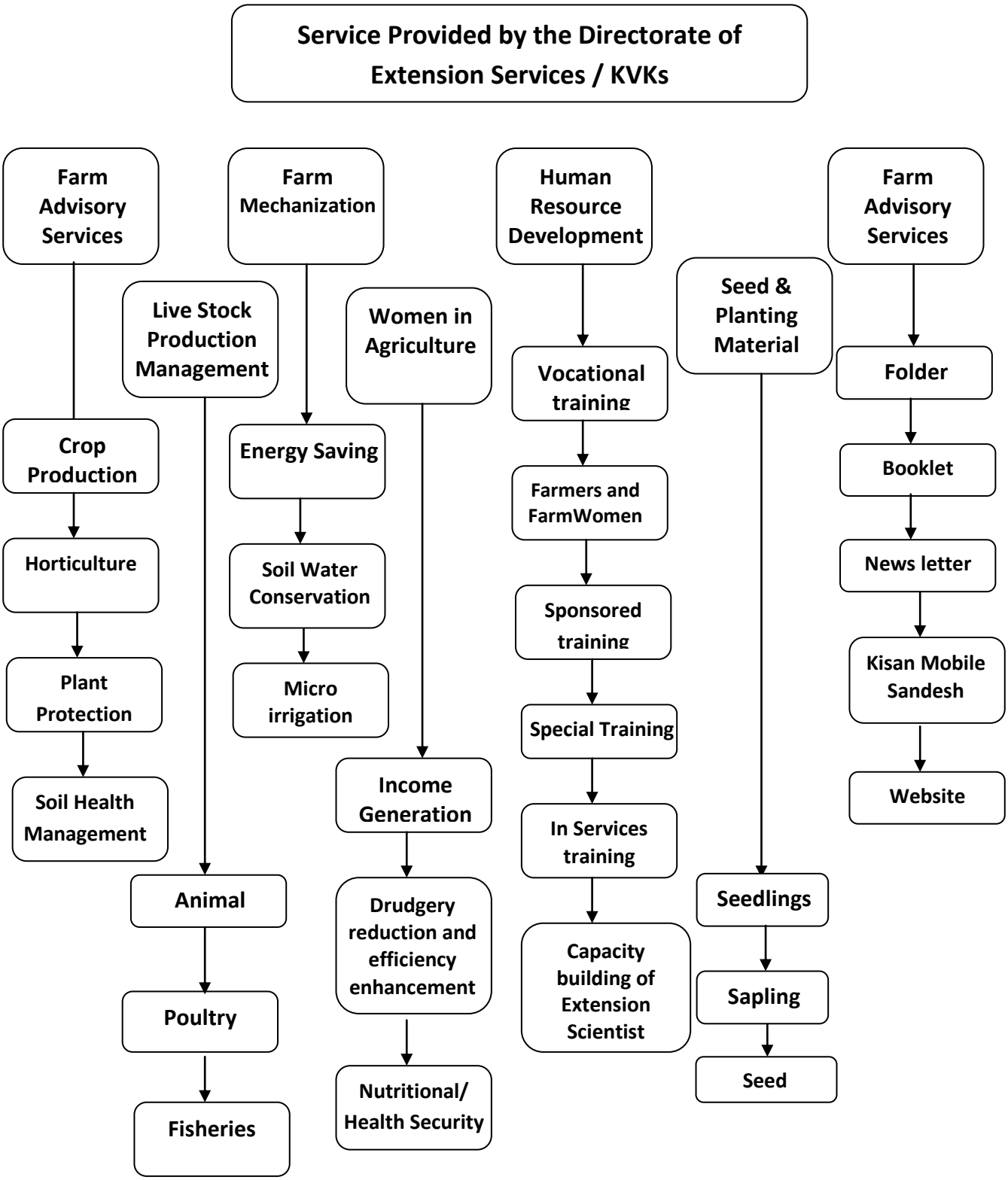
The major activities of KVKs are given below:

- On farm testing for assessing the suitability of technology farming systems.
- Frontline demonstrations to establish production potentials of newly released technologies on farmers' fields and provide feedback.
- Training of farmers and farmwomen to upgrade their knowledge and skills in modern agricultural technologies and training of extension personnel to orient them in the frontier areas of technology development.
- Work as resource and knowledge centre of agricultural technologies for supporting initiatives of public, private and voluntary sector for improving the agricultural economy of the district.
- Create awareness about frontier technologies through a number of extension activities *viz*: Farmer fair, Field day, Campaign, Ex-trainees meet, etc.
- For enhancing the productivity through increased seed replacement rate and use of quality planting material KVKs are taking up the activities of producing quality seed and planting material.

Thrust Areas:

- Doubling Farmers Income by 2022
- Development of agri.-premiership among farmers
- Enhance crop productivity through, intensive vocational trainings of farmers, farm women and rural youth.
- Demonstrate and disseminate the integrated approach encompassing the feasible components of farming and related technologies targeting towards enhancing the farm family income.
- Crop diversification with suitable oilseed, pulse, fruit and vegetable cultivation.
- Testing of early maturing high yielding varieties of major crops on farmer's field.
- Awareness regarding different methods of water harvesting and conservation including construction of small water retention structures (Rain-Water harvesting)
- Soil fertility improvement to sustain soil health.
- Integrated nutrient management in different crops.
- Popularization of resource conservation technologies.
- Post harvest value addition and entrepreneurship development for agricultural produce.
- Balanced feeding and reproduction of livestock and poultry.
- Clean milk production and processing of dairy products.
- Promotion of exotic and off-season cultivation of vegetables, medicinal and aromatic plants.
- Promotion of organic farming.

- Use of improved implements for drudgery reduction.
- Demonstrations of improved farm – machinery to farmers.
- Demonstrations on utilization of innovative traditional knowledge of the farmers.



KVKs identified as Centre of Specialization

S. No.	Name of KVKs	Specialization
1.	Agar Malwa	New KVK, hence not specialised yet
2.	Alirajpur	New KVK, hence not specialised yet
3.	Aron (Guna)	Coriander Production Technology
4.	Ashok Nagar	Durum Wheat Production Technology
5.	Badwani	Chilli Production and Value addition of spices
6.	Datia	Natural Resource Management
7.	Dewas	Integrated Farming System
8.	Dhar	High tech vegetable cultivation
9.	Dhar II (Manawar)	New KVK, hence not specialised yet
10.	Gwalior	• Hi tech Horticulture • Vermi-composting Technology
11.	Jhabua	Kadaknath rearing in Integrated Farming System
12.	Khandwa	Cotton Production Technology
13.	Khargone	Pomegranate & Watermelon Production Technology
14.	Lahar(Bhind)	Crop diversification
15.	Mandsaur	Seed spices
16.	Morena	• Apiculture • Conservation agriculture
17.	Neemuch	Garlic Processing Technology
18.	Rajgarh	Hi tech fruit nursery
19.	Shajapur	Mandarin Production Technology
20.	Sheopur	Management of soil & water resources & IFS
21.	Shivpuri	Mechanization in ground nut and Hi - tech tomato production
22.	Ujjain	Integrated Nutrient Management
23.	Bhopal	Farm mechanization
24.	Sehore	Integrated Farming System
25.	Ratlam	Dairy Management and Dairy Technology
26.	Indore	Organic Farming
27.	Burhanpur	Banana Production Technology

1. Major activities of KVKs under RVSKVV, Gwalior

1.1 On Farm Trial

The KVKs conducted 375 On Farm Trials for assessment and refinement of new technologies generated by RVSKVV, Gwalior, other Universities and ICAR Institutes as per local needs and micro farming situations. A total of 5455 farmers were direct beneficiaries of the OFTs as their fields/units/animals were chosen for conducting the trials. Details of OFTs conducted by KVKs under the directorate are given below:

Institutions wise OFTs on crops and enterprises conducted during 2019-20

Host Institute	No. of OFTs	Beneficiaries
OFT on Crops		
RVSKVV	262	3432
ICAR & NGO	57	758
Sub Total (a)	**319**	**4190**
OFT on Enterprises		
RVSKVV	39	911
ICAR & NGO	17	354
Sub Total(b)	**56**	**1265**
Grand Total	**375**	**5455**

Thematic area wise details of OFTs conducted on crops and enterprises are described below.

Thematic area wise details of OFTs conducted during 2019-20

Thematic Area	No. of OFTs	No. of Beneficiaries
Cropping Systems	8	41
Varietal evaluation	66	551
Improved Implement/Farm Machinery	18	193
Integrated Crop Management	26	222
Integrated Disease Management	15	128
Integrated Pest Management	31	290
Natural Resource Management	08	79
Resource Conservation Technology	05	30

Thematic Area	No. of OFTs	No. of Beneficiaries
TOT	02	150
Soil Fertility Management	51	499
Medicinal crops	03	30
Weed Management	16	142
Drudgery Reduction	8	104
Nutritional Security	11	143
Income Generation	11	85
Information and Communication Technology	15	1302
Agro-forestry	02	10
Horticulture crop	23	191
LPM (Nutrition, Disease Management)	21	250
Others (Poultry, fisheries, Mushroom etc)	35	1015
Total	**375**	**5455**

1. 2 Frontline Demonstrations

Frontline demonstrations are conducted to demonstrate the potentials of recent and location specific proven technologies of agriculture and allied fields among farming community and extension functionaries for up-scaling in the larger area as well as for generating the production data along with the feedback for research system and planners. During the reporting year, a total number of **1895** FLDs were conducted on various oilseeds, pulses, cereals, vegetables crops and cash crops, agro forestry and other improved farm machineries covering the total area of **1054.46ha**. In addition to these FLDs, **3485** demonstrations in **1578 ha** area were also conducted on various oilseed and pulse crops under **cluster demonstrations** programme. Moreover, demonstrations on **07**important income generating enterprises like KMAS, dairy, poultry, goatry, azola, raised bed etc. were also conducted through which **505** farmers were directly benefitted.

Crop wise details of FLDs Conducted during 2019-20through KVKs

S. No.	Crop	Area (ha)	No. of Beneficiaries	% increase
Cereals				
1.	Rice	14	45	98.16
2.	wheat	123.8	326	13.99
3.	Maize	39.2	104	178.6
4.	Pearl millet	2	10	21.16
5.	Jwar (Sorgham)	4	10	-
Pulses				
6.	Black Gram	64.6	155	26.08
7.	Gram	35.8	104	12.02
8.	Pigeon pea	18	62	27.10

9.	Green Gram	9.2	28	25.98
10.	Linseed	2.8	7	-
Oilseed				
11.	Soybean	107.9	259	21.78
12.	Mustard	20.5	58	14.36
13.	Groundnut	04	10	25.55
14.	Sesame	2	5	30.69
Vegetables				
15.	Cauliflower	4	10	23.37
16.	Tomato	4.6	18	12.71
17.	Okra	1	10	36.55
18.	Potato	3	10	26.43
19.	Cactus	12	12	-
20.	Bottelgourd	1	10	14.14
21.	Cucumber	3.5	20	13.615
22.	Okra	1	10	36.55
Spices				
23.	Garlic	29	111	15.3
24.	Chilli	24	75	48.95
25.	Onion	18.5	64	19.50
26.	K. Onion	21.6	176	44.08
27.	Corriander	4.8	17	-
28.	Fenugreek	2.6	13	10.24
Fibre Crops				
29.	Cotton	10	30	14.45
Flower Crops				
30.	Marigold	7	30	30.01
Medicinal Crops				
31.	Tulsi	2.6	13	20
32.	Ajwaian	7.6	23	32.79
Fruit Crops				
33.	Banana	-	5	15.29
34.	Papaya	4	15	23.68
35.	Drumstick	10	10	100
36.	Sugarcane	2	10	-
37.	Guava	4	10	21.33
38.	Mandarin	2	10	-
	Total	**627.6**	**1895**	**1054.46**

FLDs conducted on enterprises during 2019-20

S. No.	Enterprise	Area (ha)/No. of unit	No. of Beneficiaries	% increase
1	Buffalo	154	184	20.22
2	Cow	20	20	13.56
3	Goat	10	10	61.33
4	Fish	6	14	492
5	Poultry	15	15	66.5
6	Kitchen Garden	2	15	35.44
7	Home Science	121.05	247	44.13
Total		**328.05**	**505**	**733.18**

Cluster Demonstration Pulses and Oilseed conducted by KVKs during 2019-20

S. No.	Cluster Crop	Variety	Area (ha)	No. of Beneficiaries	% increase
	Pulses				
1	Black Gram	PU 1	20	50	36.13
		PU-31	20	50	43.40
		Pratap Urad-1	70	190	36.81
		Sekhar 2	20	50	-
2	Chickpea	RVG202	255	375	-
		RVG201	80	125	-
		JG14	50	50	-
		JG11	10	25	-
3	Pigeonpea	Rajeshwari	10	25	32.32
		Pusa-992	30	75	44.99
4	Green Gram	T.J.M.-3	10	25	28.68
		MH-421	25	25	20.4
6	Filed Pea	Aman	20	50	
	Total		**620**	**1115**	
	Oilseed				
5	Soybean	RVS-2001-4	90	200	23.43
		JS 20-29	10	25	32.86
6	Mustard	IJ 31	20	50	19.75
		Giriraj	10	25	-
		NRCHB 101	668	1670	-
		RH406	10	25	-
		RVM-2	130	325	-
7	Groundnut	GG-20	10	25	20
9	Sesame	T.K.G.-308	10	25	55.91
Total			**958**	**2370**	

1.3 Training Programmes

Training has been considered a key component for updating the knowledge and inculcating new skills among the participants. The great emphasis has been given on organizing trainings both for the farmers as well as for the trainers. A total of 1959 training programmes were organized involving to 52782 beneficiaries including farmers and farm women, rural youth, extension personnel and sponsored from different agencies detail of which are given in following table.

S. No.	Training	No. of Courses	No. of Beneficiaries
1.	Farmers & Farm Women	1274	33419
2.	Farm Women	280	6739
3.	Rural Youth	111	3018
4.	Extension personnel/ In Service	130	3622
5.	Vocational trainings	57	1488
6.	Sponsored Training	107	4496
Total		**1959**	**52782**

1.4 Extension Activities

With the objective of creating awareness about advanced agricultural technologies, a number of extension activities were organised by KVKs at their campuses and in the villages. These extension activities include method demonstrations for small group to Kisan Melas for huge gathering. It includes use of old communication techniques of poster exhibition to latest technique of SMS and social media use for transfer of technology. Broadly, these activities are advisory based like farm advisory services, lectures delivered by resource persons, animal health camps and vaccination camp, exhibitions, extension literature and popular article, media based activities like CD/DVD, film show, news paper coverage, radio talks and TV talks, meeting based like ex-trainee Sammelan, celebration of important days, club meet, farmers' seminar, field day, group meet, Gosthi, Mela and SHG meeting Technology week concept was given to the KVKs for showcasing the available technologies to the district level extension functionaries and farmers. A total of 20570 extension activities organised by the KVKs benefitting 717876 beneficiaries. Details of various extension activities are given below:

Extension Activities - 2019

S. No	Particulars	No of Activities	No. of Beneficiaries
1.	Advisory Services	28	50050
2.	Agri. mobile clinic	814	58348
3.	Animal Health Camp	42	2218
4.	Awareness programme	143	9844
5.	Celebration of important days	182	13451
6.	Diagnostic visits	692	7821
7.	Exhibition	119	22925

8.	Exposure visits	55	1734
9.	Extension Literature	122	13114
10.	Ex-trainees Sammelan	25	1006
11.	Farm advisory Services	1122	316566
12.	Farmers Seminar/Workshop	3	378
13.	Farmers visit to KVK	12579	38727
14.	Field Day	230	8808
15.	Film Show	238	4492
16.	Group meetings	148	3248
17.	Interface	2	109
18.	Kharif/Rabi Sammelan	2	984
19.	Kisan Ghosthi	210	10259
20.	Kisan Mela	52	42904
21.	Krishi Mahotsav	7	1570
22.	Lectures delivered as resource persons	1118	50702
23.	Mahila Mandals conveners meetings	40	1377
24.	Method Demonstrations	174	1858
25.	Newspaper coverage	216	0
26.	Popular articles	3	0
27.	Pradhanmantri phasal beema yojana	24	2073
28.	Radio talks	49	0
29.	Swachchhata Abhiyan	223	3760
30.	Swachchhata Pakhwada	3	1282
31.	Scientific visit to farmers field	1355	15705
32.	Self Help Group conveners meetings	88	1981
33.	Soil health Camp	122	2522
34.	Soil test campaigns	110	3160
35.	Summer deep ploughing campaigning	2	141
36.	Technology Week Celebration	42	4569
37.	TV talks	9	0
38.	Live Interaction of Hon'ble PM with farmers	3	391
39.	Parthaniyam Awareness week programme 16.08.2018 to 22.08.2018	1	341
40.	Others	173	19458
Total		**20570**	**717876**

1.5 Production and Supply of Technological Inputs

Timely and adequate availability of the quality seeds to ensure better yield is very essential and remains as a major constraints to the farmers. Therefore, it was taken as a challenge and appropriate steps were taken at the KVKs for helping the farmers in this regard. The KVKs produced 3987.76 q seed of different crops during 2019-20. The details are given in following table.

a. Seed Production

Name of KVK	Crop	Type of Seed	Quantity produced(q)
Alirajpur	Soybean, Blackgram, Pigeonpea and Gram	Breeder and TL	87
Ashoknagar	Black gram, Chickpea	Breeder	118
Barwani	Soybean and Chickpea	Breeder	255
Bhind	Mustard, Wheat and Barley	Breeder and TL	352.61
Datia	Barley and Sunhemp	-	207.72
Dewas	Soybean, Chickpea and Wheat	Breeder	401.3
Dhar	Soybean and Chickpea	Breeder	308
Guna	Soybean , Black gram and Chickpea	Breeder and TL	416.4
Gwalior	Okra, Fenugreek, Spinach, Sponge gourd Bottle Gourd and Marigold	TL	206.5 Kg
Jhabua	Soybean	Breeder	
Khandwa	Soybean	Breeder	45
Khargone	Soybean, Pigeonpea and Chickpea	Breeder	489.2
Mandsaur	Soybean, green gram, chick pea and lentil	Breeder	334.5
Neemuch	Soybean and Chickpea, Tulsi and Ashwagandha	Breeder and TL	52
Rajgarh	Soybean, Wheat and Lentil	Breeder	
Shajapur	Soybean and Chickpea, Cucumber, Gilki,	Breeder	216.08
Sheopur	Soybean, Chickpea and Wheat	Breeder and TL	25.3
Shivpuri	Soybean and Chickpea	Breeder	301.2
Ujjain	Soybean, Chickpea and Wheat	Breeder	
Burhanpur	Soybean, Pigeonpea, Wheat, Chickpea, Maize	-	19

Ratlam	Maize, Wheat, Soybean, Groundnut, Chick pea and Black gram	-	43.9
Sehore	Soybean, Wheat Pigeonpea, Barley, Chickpea,	TL	70.354
Manawar	Soynean & gram	Breeder	266.5
Morena	Gram	Breeder	18.5
Indore	Soynean & gram	TL	74.45
Total Seed Produced at KVK Farms (q)			**3987.76**

b. Planting Material (Seedlings/Saplings) Production:

Crop	Quantity (No.)
Vegetables	6485
Tomato	209841
Brinjal	21198
Chilli	111335
Cabbage	30427
Cauliflower	24566
Broccoli	0
Knol-Khol	0
Bottle Gourd	500
Water meloon	10000
Bitter Gourd	500
Fenufreek	200
Kharif Onion	42191
Cucumber	500
Potato	286
Mushroom	2.1 Kg
Fruit Plants	6472
Mango (Grafted)	924
Lemon	1134
Pomegranate	32
Guava	200
Karonda	0
Jackfruit	287
Custard Apple	4699
Jamun	1788
Aonla	69
Drum Stick	1070
Ber Bud	200
Beal	37
Guava	1736
Papaya	16517
Sweet Orange	150

Almond	2
Ornamental plants	1000
Marigold	17205
Ashok	164
Rose	19
Gladiolus	2500
Forest plants	
Bargad	5
Kumut	5
Kadwa Neem	1
Gudhal	4
Kumut	5
Bamboo	520
Gulmohar	245
Ashok	164
Amltas	4
Mogra	1
Shami	37
Pipal	58
Karanj	234
Sulagana fali	600
Total	**516117**

1.6 Soil and Water Sample Analysed

Soil and water testing is an import activity of KVK for improving the soil fertility and sustainability of agricultural production. KVK wise details of soil samples collected, analyzed and numbers of soil Health Card distributed among farmers have been given hereunder.

a. Status of Soil Sample and Soil Health cards

KVK Name	Status of establishment of Soil testing Laboratory (Y/N) and year, if yes	Soil Testing Kits till date		No of soil samples		No. of Samples analyzed			No. of Farmers benefited			No. of Villages covered	Amount realized	Soil health card distributed to the farmers by KVK (Nos)	
						by KVKs		By Department	By KVK		By Department			Through Mini Soil Testing kit	Through Soil testing laboratory
		Sanctioned	Procured	Collected by KVKs	Provided by Dept./ DDA	Mini Soil Testing kit	Soil testing laboratory		Mini Soil Testing kit	Soil testing laboratory					
Agar	N	-	-	-	-	-	-	-	-	-	-	-	-	-	-

Malwa															
Alirajpur	N	-	-	500			550			550		17	0		
Ashoknagar	Y, 2018-19	2	2	250	0	250	0	0	250	Nil	-	250	0	250	0
Barwani	Yes	-	-	1580	0	496	112	0	615	112	NA	52	0	615	112
Lahar (Bhind)	Y, 2013	1	1	579	0	579	0	4820	579	0	4820	374	0	579	0
Datia	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Dewas	Y, 2012	02	02	320	0	320	0	0	320	0	0	26	10875	320	0
Dhar	Y	2	2	1000	0	713	688	23856	656	636	148848	1510	0	656	636
Dhar (Manawar)	N	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Guna	Yes 2005	1	1	542	153	484	211	0	484	211	-	8	0	484	211
Gwalior	Y	1	1	1016	171	0	2637	0	0	14594	0	0	0	0	0
Jhabua	Y, 2006	2	2	800	0	250	750	0	250	750	-	13	0	250	750
Khandwa	Y, 2005	2	2	240	1274	392	725	7553	1670	4569	40009	27	0	1670	4569
Khargone	Y, 2005	1	1	542	880	542							0		
Mandsaur	Yes	2	2	307	0	307	307	784	307	0	784	305	0	0	0
Morena	Y, 2005	-	-	749	0	0	749	-	-	749	-	18	0	0	729
Neemuch		2	2	595	6386	595	0	10550	595	0	25832	799	0	595	0
Rajgarh	Y	1	1	180	0	180	0	0	180	0	0	4	0	180	0
Shajapur	Y	2	2	539	4128	539	4128	389	0	829	389	0	829	47	85
Sheopur	-	-	-	-	0	0	0	0					0		
Shivpuri	No	2	2	160	0	160	0	0	160	0	0	10	9600	160	0
Ujjain	Y	1	1	756	244	100	900	0	100	900	0	15	0	100	900
Bhopal	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Burhanpur	N	0	2	300	1503	1803	0	4741	1803	0	10314			1803	0
Indore	Y, 2004-05	2	2	130	470	600	0	10873	600	-	28317	26	54691	600	0
Ratlam	Y, 2008	2	2	62	0	62	62	0	62	62	-	22	18600	62	62
Sehore	Y, 2012	-	-	130	2000	0	130	3692	-	130	-	84	0	0	130
Total				**11277**	**17209**	**8372**	**11949**	**67258**	**8631**	**24092**	**259313**	**3560**	**94595**	**8371**	**8184**

b. Details of water samples analyzed :

KVK Name	No. of Samples	No. of Farmers	No. of Villages	Amount realized	Test report distributed to the farmers (Nos)
Jhabua	25	25	15	-	25
Note: Other KVKs not analyzed water samples					

1.7 Kisan Mobile Advisory Services

Kisan Mobile Advisory (KMA) is the easiest ICT tool working successfully for dissemination of latest information to the farmers and farm women. This is a unique programme for making linkages between different stakeholders who are key players for making agriculture more productive. During the year 2019, a total of 1519 farm advisory were issued by the KVKs from which 1043704 beneficiaries directly benefited. In addition to this, KVKs also provided audio, video and photo based advisories through WhatsApp.

Status of Kisan Mobile Advisory (KMA) - 2019

Name of KVK	**Number of calls received**	**No of Messages sent**	**No. of farmers received messages**	**Total no of villages in District**	**No of village Covered by KVK through KMA**
Agar Malwa	-	0	0	227	-
Alirajpur	-	0	0	288	-
Ashoknagar	-	33	32000	921	921
Badwani	11	62	30600	693	693
Bhind	238	41	16124	877	257
Datia	1135	57	123000	610	610
Dewas	-	39	38890	1067	1027
Dhar	1524	70	126489	1576	1270
Dhar II (Manawar)	-	0	0	1576	0
Guna	2118	26	53777	1260	1260
Gwalior	387	52	26500	717	717
Jhabua	226	103	13240	813	813
Khandwa	-	52	34282	710	710
Khargone	-	93	95416	1407	1407
Mandsaur	3323	30	120223	944	944

Morena	206	53	13710	775	775
Neemuch	-	39	18650	799	799
Rajgarh	3014	270	Not Mentioned	1600	908
Shajapur	271	233	Not Mentioned	587	587
Sheopur	-	28	50600	610	610
Shivpuri	1197	22	51000	1235	1235
Ujjain	264	55	64199	1096	166
Bhopal	-	-	-	-	-
Burhanpur	35	23	20244	272	250
Indore	-	33	37568	633	633
Ratlam	-	61	42610	1053	1053
Sehore	27150	44	34582	1049	1049
Total	**41099**	**1519**	**1043704**	**23395**	**18694**

1.8: Publications and Media Development by KVKs

During 2019, various research and farmer friendly publications were published and distributed among the clients for issuing timely advisory on technological developments in agriculture and allied areas.

Literature/Media Published/ Developed by KVKs: 2019

S. No.	Literature/ Publication/Media	Number
1.	Abstract	90
2.	Book	06
3.	Book Chapter	19
4.	Booklet	28
5.	Leaflets/ Folder/ Pamphlet	105
6.	Popular article	112
7.	Technical Bulletin	27
8.	Training Manual	30
9.	Technical Report	166
10.	Year Planner	20
11.	Research Paper	44
12.	Electronic Media Show (CD/VCD)	387

1.9 : Farmers visit to KVK

The table below gives a KVK wise complete account of farmers', VIPs and officials visited the centre for various purposes around the year. It is observable that the KVKs establish its place as a scientific agricultural institution at district level providing functional solutions to the farmers on their agricultural issues.

Footfall of farmers in KVKs -2019

Name of KVK	Footfall during 2019			
	No. of Farmers	No. of officials	No. of VIPs	Total
AgarMalwa	153	10	2	165
Alirajpur	568	56	02	626
Ashoknagar	249	50	6	305
Barwani	3276	35	14	3325
Lahar (Bhind)	325	75	9	409
Datia	1823	32	05	1860
Dewas	1029	237	23	1289
Dhar	34502	272	12	34786
Dhar II (Manawar)	-	-	-	-
Guna	1650	175	36	1861
Gwalior	5547	311	22	5880
Jhabua	486	74	8	568
Khandwa	6406	26	2	6434
Khargone	630	56	7	693
Mandsaur	2748	122	30	2902
Morena	5214	555	25	5794
Neemuch	2486	78	6	2570
Rajgarh	550	102	10	662
Shajapur	2551	23	10	2584
Sheopur	Not Mentioned			
Shivpuri	2344	48	5	2397
Ujjain	4004	121	38	4163
Bhopal	Not reported			
Burhanpur	2000	150	12	2126 approx
Indore	4850	129	10	4989
Ratlam	2556	153	18	2727
Sehore	4561	280	17	4858
Total	**90508**	**3170**	**329**	**93973**

1.10: Outreach of KVK

The KVKs are functioning at district level as a model institution for transfer of technologies among farmers and district extension machinery. The KVK work on principles of scientific agriculture and follow cluster based approach for agricultural

development in the district. It works in adopted villages and develop them as model for district extension system. The table below gives a detailed account of coverage and outreach of KVK in the district

Outreach of KVK - 2019

Name of KVK	Total number of Block/villages in district		Number of Blocks		Number of Villages	
	Block	Village	Intensive	Extensive	Intensive	Extensive
Agar Malwa	-	-	-	-	-	-
Alirajpur	6	543	2	06	03	27
Ashoknagar	4	921	3	4	15	450
Barwani	7	693	4	7	46	356
Lahar (Bhind)	6	877	4	6	27	798
Datia	03	610	03	03	50	610
Dhar	13	1579	5	8	68	1511
DharII (Manawar)	7	-	-	-	-	-
Dewas	06	1067	5	6	25	950
Guna	05	1260	03	02	75	1185
Gwalior	04	717	04	04	67	650
Jhabua	4	6	6	813	-	-
Khandwa	7	725	3	4	4	721
Khargone	9	1407	3	6	22	1395
Mandsaur	05	944	3	2	570	374
Morena	07	775	05	07	16	460
Neemuch	1	3	7	748	799	799
Rajgarh	6	1600	4	2	653	947
Shajapur	4	587	4	4	32	587
Sheopur	3	610	3	-	13	68
Shivpuri	8	1235	6	2	250	985
Ujjain	6	1096	6	6	38	1096
Bhopal	Not Reported	-	-	-	-	-
Burhanpur	02	272	02	02	20	250
Indore	04	633	04	04	17	633
Ratlam	06	1086	6	6	9	108
Sehore	05	1049	04	05	25	925
Total	**138**	**20295**	**99**	**1657**	**2844**	**15885**

1.11 Other Important Achievements

1.11.1: Awards & Recognitions:

Major awards, recognitions and appreciations received by the KVK scientists, associated farmers and KVK as an institution are given in the table below;

KVK Name	Name of award /awardees	Type of award (Ind./Group/Inst./Farmer)	Award category (local/ Regional / National)	Awarding Organizations	Amount received
Alirajpur	First prize for mango exhibition/ Shri Yuvraj Singh	Farmer	National	Department of Horticulture Govt of U.P.	-
Ashoknagar	Jewik Krishi Protsahan Puraskar Dr. BS Gupta	Individual	Patanjali Peeth, Haridwar	Nil	
	Scientist of the year Dr. VK Jain(Scientist)	Individual	JNKVV, Jabalpur	Nil	
	Young Scientist of the year Sh.HK Trivedi	Individual	JNKVV, Jabalpur	Nil	-
	Jag Jivan Ram innovator farmer Sh. Rajpal Narvariya	Individual	ICAR New Delhi		100000
	Dr. V.K. Jain	Individual	-	SOHR and Innovation, Agra	50000
Barwani	Innovative Farmer/ Mrs. Lalita Mukati	Farmer	National	ICAR, New Delhi	
	National HaldharAward"/ Mrs. Lalita Mukati	Farmer	National	ICAR, New Delhi	100000

	Appreciation for organic farming/ Mrs. Lalita Mukati	Farmer	State	RVSKVV, Gwalior	10000
Dhar	Fakhruddin Ali Ahmed Award For Outstanding Research in Tribal Farming System-2018	Individual	National	ICAR	50000
Datia	Receiving Best NICRA KVK Award	**Institutional**	National	ICAR – CRIDA	-
Jhabua	RVSKVV Best extension scientist award	Individual	Regional	RVSKVV, Gwalior	
	RVSKVV Best innovative Farmer award	Individual	Regional	RVSKVV, Gwalior	
	Dhanuka Innovative Best KVK Award-2018	KVK team	National	Dhanuka Agritech Limited, New delhi	2,50,000/-
	Dhanuka Innovative farmer Award-2018	Individual	National	Dhanuka Agritech Limited, New delhi	25000/-
Morena	Dr. S. P. Singh	Individual **"2nd National Conference cum workshop"**	National	Department of Bio technology & Microbiology KALP Laboratories, Mathura	-
Ujjain	Sh. Ashwini Singh	Farmer	National	AIASA, ICAR and JNKVV	-
	Sh. Ashwini Singh	Farmer	National	ICAR, New Delhi	50000

	Smt. Ghazala Khan	Individual	-	RVSKVV, Gwalior	-
	Dr. R.P.Sharma	Individual	State	Government of Gujarat	-
	Dr. R.P.Sharma	Individual	State	RVSKVV, Gwalior	-
	Sh. Ashwini Singh	Farmer	State	RVSKVV, Gwalior	10000
	Sh. Hakam Singh	Individual	-	Dhanuka Innovative Award	-
Burhanpur	Dr. Ajeet Singh Sr. Scientist & Head	Best poster award entitled Impact of mulching on water melon	National	Progressive Horticulture Conclave 2019 held at ICAR-IISR, Lucknow, UP. Dated December 8-10, 2019.	-
	Mahindra Samridhi Award 2019	Shri Jitendra Patidar	Farmer	Mahendra Samriddhi India Agri Award Feb. 2019	211000.00
	Mahindra Samridhi Award 2019 (Krishak Samrat Samman)	Shri Arvind Dhakad	Farmer	Mahendra Samriddhi India Agri Award Feb. 2019	51000.00
	Best Farmer Representing of District Level in Agriculture Field	-	05 Farmer	Project Directorate, ATMA, Ratlam (M.P.)	25000.00 each
	Best Farmer Representing of Block Level in Agriculture Field	-	30 Farmers	Project Directorate, ATMA, Ratlam (M.P.)	10000.00 each

Award and Recognition: 2020-21

- ICAR - Pt. Deendayal Upadhyay Krishi Vigyan Protsahan Puruskar - 2019 (National) conferred to KVK Datia (National Best KVK)
- ICAR - Pt. Deendayal Upadhyay Krishi Vigyan Protsahan Puruskar - 2019 (Zonal – Zone IX) conferred to KVK Ujjain (Zonal Best KVK)
- Haldhar Organic Krishak Purushar – 2019 (National) given to Mrs Sarika Patidar of District Barwani
- Dhanuka Ag. Innovative Award (National) - KVK Jhabua
- National Poultry Extension Award by Poulrty Association of India - KVK Jhabua
- Dhanuka Innovative Agriculture Award for Water Harvesting – KVK Datia
- Outlook - Swaraj Award –2019 - KVK Morena

1.11.2 Programme on International Soil Health Day

On the occasion of International Soil Day on 5th December, 2019 Kisan Sammelan were organized at all the Krishi Vigyan Kendras in these Sammelans and Soil Health Cards were distributed to the farmers.

1.11.3 Progress of Seed Hub Project

KVK	Crop	Kharif		Rabi	
		Area (ha)	**Production (q)**	**Area (ha)**	**Production (q)**
Datia	Black gram	70.05	00	-	-
	Chick Pea RVG-202	-	-	20.50	174.44
Dewas	Black Gram	8.50	0	-	-
	pigeon pea Rajeshwari	8.00	2.64	-	-
	Chickpea RVG-203	-	-	49.5	461.52
Morena	Pigeon pea	02	00		
	Chickpea	-	-	2.5	9.60
Ujjain	Chickpea	RVG-202		38.00	225.00

1.11.5: Flagship Programmes of ICAR implemented by KVKs/DES:

1. National Innovations on Climate Resilient Agriculture (NICRA)

National Innovations on Climate Resilient Agriculture (NICRA) is a network project of the Indian Council of Agricultural Research (ICAR) launched in February, 2011. The project aims to enhance resilience of Indian agriculture to climate change and climate vulnerability through strategic research and technology demonstration. The research on adaptation and mitigation covers crops, livestock, fisheries and natural resource management. The project consists of four components viz. Strategic Research, Technology Demonstration, Capacity Building and Sponsored/Competitive Grants. The project was formally launched by the Hon'ble

Union Minister for Agriculture & Food Processing Industries Shri Sharad Pawarji on 2nd February 2011.

NICRA is being implemented by five KVKs under RVSKVV, Gwalior since 2011. Three KVKs namely Datia, Guna and Morena is implementing the project since its inception in 2011 whereas two more KVKs i.e. Jhabua and Ratlam were included in NICRA during 2015-16. KVK Datia had been awarded as Best NICRA KVK twice during 2014 and 2019 for outstanding work in water conservation under technology demonstration component.

<table>
<tr><td>  </td><td>  </td></tr>
<tr><td>Stored rain water in renovated check dam</td><td>Stored rain water in farm pond (scientist of ATARI Zone IX Jabalpur visited the farm pond)</td></tr>
<tr><td>  </td><td>  </td></tr>
<tr><td>Height of Constructed Poly Bag Check Dam (Bori Bandhan)</td><td>Rain water Stored in Bori Bandhan</td></tr>
</table>

2. Cluster Front Line Demonstrations (CFLD) on Oilseed and Pulses

A. Pulses

Indian government imports large quantity of pulses to fulfil domestic requirement of pulses. In this regard, to sustain this production and consumption system, the Department of Agriculture, Cooperation and Farmers Welfare had sanctioned the project "Cluster Frontline Demonstrations on pulses from 2015-16"

to ICAR-ATARI, Jabalpur through National Food Security Mission. The basic strategy of the Mission is to promote and extend improved technologies, i.e., seed, micro-nutrients, soil amendments, integrated pest management, farm machinery and implements, irrigation devices along with capacity building of farmers. This project was implemented by all KVKs under RVSKVV, Gwalior with main objective to boost the production and productivity of pulses through CFLDs with latest and specific technologies.

	
CFLD on Black gram during Kharif 2018	**Cluster demonstration of Field Pea during 2017-18**

B. Oilseed

Oil seed crops have ecological conditions in India, resulted in the production of 7.87 m tonnes of seed mustard in 2013-2014 and our productivity is 10.9kg/ha. It is now widely accepted fact that training to farmers and farm women increases the technical knowledge regarding package of practices. KVKs are playing a vital role across the rural economy in distinguish field as animal husbandry, horticulture, plant protection and food processing. India is an important rape seed mustard growing country in the world, occupying largest area and has second position in production after China.

Visit of Shri Pradip Agrawal Ji M.L.A. Seonda constituency on cluster front line demonstration of mustard village Raraua Jivan Dated

3. Seed Hub Project

The Government of India has launched Seed Hub Project during 2016-17 to promote indigenous production of pulses in India by creating 150 Seed Hubs in KVKs across the country. ICAR-IIPR, Kanpur has been given responsibility of nodal agency at National level. Four KVKs namely Datia, Dewas, Morena and Ujjain has been selected for implementation of Seed Hub project among KVKs under RVSKVV, Gwalior. Major crop like Black gram, Green gram, Pigeon pea, chick pea and fields pea are being taken up for seed production under the seed hub project.

Crops under Seed Hub Project Datia

4. Attracting and Retaining Youth in Agriculture (ARYA)

In order to create interest and confidence among rural youth in agriculture, there is needed to make agriculture more profitable. Retaining youth in agriculture and making agriculture more profitable are thus, big challenges. There is a continuous increase in migration of rural youth to urban areas. On the other hand, small holdings are on the rise which posses challenge to food security for increasing population. Thus, it was felt to bring a comprehensive model for the development of rural youth in general and agricultural youth in particular. Thus, realising the importance of rural youth in agricultural development especially from the point of view of food security of the country, ICAR has initiated a programme on "Attracting and Retaining of Youth in Agriculture (ARYA)" with following objectives;

1. To attract and empower the Youth in Rural Areas to take up various Agriculture, allied and service sector enterprises for sustainable income and gainful employment in selected districts.
2. To enable the Farm Youth to establish network groups to take up resource and capital intensive activities like processing, value addition and marketing.
3. To demonstrate functional linkage with different institutions and stakeholders for convergence of opportunities available under various schemes/program for sustainable development of youth.

KVK, Gwalior was selected for implementing ARYA project during 2016-1 in first phase and currently five KVKs under RVSKVV are implementing this project.

5. Farmers' FIRST Project

The Farmer FIRST as a concept of ICAR is developed as farmer in a centric role for research problem identification, prioritization and conduct of experiments and its management in farmers' conditions. The focus is on farmer's Farm, Innovations, Resources, Science and Technology (FIRST). Two terms 'enriching knowledge' and 'integrating technology' qualify the meaning of Farmer FIRST in Indian context. Enriching knowledge signifies the need for the research system as well as farmers to learn from each other in context to existing farm environment, perception of each other and interactions with the sub-systems established around. Technology integration is looked from the perspective that the scientific outputs coming out from the research institutions, many times do not fit as such in the farmers' conditions and thus, certain alterations and adaptations are required at field level for their acceptance, adoption and success. 'Farmer FIRST' programme aims at enhancing farmer-scientist interface for technology development and application. It will be achieved with focus on innovations, technology, feedback, multiple stakeholder's participation, multiple realities, multi method approaches, vulnerability and livelihood interventions.

The Farmers' FIRST Project is being implemented in RVSKVV since 2016-17 in ZARS/KVK, Morena.

6. Mera Gaon Mera Gaurav (MGMG): The programme is being implemented by the University through in five constituent colleges i.e. College of Agriculture, Gwalior, Indore, Sehore, Khandwa and College of Horticulture, Mandsaur and three ZARS viz; Jhabua, Khargore and Morena. The avobe V.V. units are organizing regular extension activities under MGMG in their identified villages.

2. Major Activities of Directorate of Extension Services

2.1 Meeting of Scientific Advisory Committees and monitoring of KVKs

The Scientific Advisory Committee meetings were conducted to give necessary guidance and support to carry out the mandated activities of KVK in a more planned and scientific manner. The Committee monitors progress and facilitate in-depth exchange of views in specific fields. The Committee evolves the scientific and technical vision documents for the KVK, reviews periodically and takes further course of action as deemed fit for furthering scientific and technological activities of the KVK. Activities of KVKs are monitored through thesemeeting of Scientific Advisory Committees (SAC). Director Extension Services, Joint Director Extension, and other scientists from the Directorate of Extension participated in these meetings to reviews previous activities and finalize the action plans for coming season. A total of50 SAC meetings (Kharif and Rabi) were conducted for all 27 KVKs during 2019-20. Details of SAC meetings organised during the year are as folows:

SAC Meetings Organised

Name of KVK	Date of SAC			Participants in SAC			Remarks
	1	2	3	1	2	3	
Agar Malwa	June 2019	October 2019	-	30	30	-	
Alirajpur	10.01.2019	12.7.2019	24.10.2019	40	32	35	
Ashoknagar	07.02.2019	23.09.2019	24.10.2019	40	-	-	
Barwani	07.09.2019	06.11.2019	-	24	21	-	
Lahar (Bhind)	27-03-2019	23-09-2019	11-10-2019	29	33	21	
Datia	27-09-2019	11-10-2019	-	17	30	-	
Dewas	24.09.2019	16.10.2019	-	29	34	-	
Dhar	27.09.2019	23.10.2019	-	15	17	-	
Dhar (Manawar)	26.09.2019	23.10.2019	-	26	24	-	
Guna	20.11.2019	25.09.2019	24.05.2019	43	38	28	Special meeting 06.02.2019

							32 Participants
Gwalior	30/09/2019	05/10/2019		32	38		
Jhabua	09.01.2019	11.07.2019	25.10.2019	38	35	50	
Khandwa	05.09.2019	16.10.2019	-	14	14	-	
Khargone	06.09.2019	17.10.2019	-	23	30	-	
Mandsaur	25.09.2019	16.10.2019	-	26	24	-	
Morena	28.09.2019	04.10.2019	-	35	41	-	
Neemuch	10.10.2019	15.10.2019	-	28	22	-	
Rajgarh	Jun-19	Oct-19	-	32	34	-	
Shajapur	15.10.2019	21.08.2019	-	35	38	-	
Sheopur	-	-	-	-	-	-	**Not mentioned**
Shivpuri	29.8.2019	09.10.2019		22	27	-	
Ujjain	25.09.2019	18.10.2019	-	34	54	-	
Bhopal	-	-	-	-	-	-	**Not Reported**
Burhanpur	16.10.2019	-	-	20	-	-	
Indore	17.10.2019	-	-	21	-	-	
Ratlam	27.09.2019	-	-	21	-	-	
Sehore	24.09.2019	16.10.2019	-	33	**16**	-	

2.2 Establishment of Agriculture Technology Information Centre (ATIC)

The construction work of ATIC building is in final stage and it has to be furnished and started soon.

2.3 Training /Workshops/ Meetings organised by the Directorate of Extension Services

Following capacity building/ HRD programmes and workshops/ review workshops were conducted for KVK scientists by the directorate of extension services during the year 2019-20:

Programme	Title of programme	Date	No. of participants	Level of Participants
CBP/Backstopping	Honey Bee Keeping - An Entrepreneur for Enhancing Farm Income	February 1-3, 2019	33	SS& Head/ Scientist
	Training on Process of e-Tendering	March 12-13, 2019	23	DDOs/Officers of various V.V. units

	On Farm production of organic inputs	February 4-5, 2020	30	KVK scientists
	Preparation & dissemination of agromet advisories at Block level under DAMU	February 23-27, 2020	>30	KVK scientists and DAMU staff
Exhibition and Sangosthi	Raj Vijay Fulwari – 2020 (An exhibition on Horticulture and processed products)	28-30 January, 2020	>200	KVKs, Farmers, Nursery, institutions and Industry
Workshop	ARM of GKMAS * FASAL	18-20 December, 2019		PI/CoPI and Scientists of GKMS & FASAL from All India
Mela	KRISHI VIJAY-2020	28-30 January 2020	>3000	Participants from all over India in west zone krishi Mela

2.4 Western Region Agricultural Fair (Krishi Vijay - 2020) Organised

Rajmata Vijayaraje Scindia Krishi VishwaVidyalaya, Gwalior (M.P.) organized Western Region Agriculture Fair (Krishi Vijay-2020) at College of Agriculture Campus, Gwalior during January 28-30, 2020 in collaboration with Directorate of Extension, Department of Agriculture, Cooperation & Farmers Welfare, Ministry of Agriculture Cooperation & Farmers Welfare, Government of India, New Delhi. The theme of the fair was Farmers' Empowerment through Agri-preneurial Ventures. The farmers' fair was inaugurated by Sh. Sachin Yadav, Hon'ble Minister, Department of Farmers Welfare and Agriculture Development, Govt. of Madhya Pradesh and Mr. Lakhan Singh Yadav, Hon'ble Minister, Department of Animal Husbandry, Govt. of Madhya Pradesh in gracious presence of Prof. S. K. Rao, Hon'ble Vice Chancellor, RVSKVV, Gwalior.

Sh. M. B. Ojha, Commissioner, Gwalior division and Prof. S. K. Rao, Hon'ble Vice Chancellor, RVSKVV, Gwalior were present as Chief guests during valedictory ceremony of the 03-days long grand farmers' event. Hon'ble Vice Chancellor acquainted the guests about the overwhelming response of the exhibitors from across the country.

More than 3600 farmers and agriculture professionals from western region states i.e. Madhya Pradesh, Rajasthan, Gujarat, Maharashtra, Chhattisgarh

participated in the fair. The fair exhibit more than 100 stalls showcasing latest agricultural technologies from various public and private sector organizations, NGOs, FPOs, SHGs, KVKs, Progressive framers etc. for updating the stakeholders of agriculture on most recent advancements.

The fair focused on latest technological attractions like IFS models, food processing and value addition, entrepreneurial ventures in agriculture and allied areas, crop diversification, water management technologies, Nutri-sensitive agriculture, climate resilient technologies, organic-*Paramparagat* farming, Hi-tech horticultural technologies, IPM, INM, Medicinal and Aromatic Plants and advancement in seed technology etc. The enough space was provided for sale counters of seed, planting materials, Bio-fertilizers and Bio-pesticides etc. Furthermore, a regular *Krishak Sangosthi* was organised on relevant subjects for the farmers with reputed experts in five sessions throughout the three days fair. It was splendidly successful attempt by DES, RVSKVV, Gwalior for organizing Western Region Agriculture Fair.

2.5 Raj Vijay Fulwari 2020 organised

Directorate of Extension Services, RVSKVV, Gwalior (M.P.) organized "Raj Vijay Fulwari-2020" at College of Agriculture, Gwalior on January 28-30, 2020. Three-day exhibition was organized with splendid display of exhibits of quality fruits, vegetables, variety of flowers and preserved fruit items. The exhibition was inaugurated by Sh. Sachin Yadav, Hon'ble Minister, Department of Farmers Welfare and Agriculture Development, Govt. of Madhya Pradesh. Mr. Lakhan Singh Yadav, Hon'ble Minister, Department of Animal Husbandry, Govt. of Madhya Pradesh was also present during the inauguration.

Prof. S. K. Rao, Hon'ble Vice Chancellor, RVSKVV, Gwalior and Sh. M. B. Ojha, Commissioner, Gwalior division were as Chief guests during valedictory ceremony of the 03-days exhibition Hon'ble Vice Chancellor acquainted the guests about the overwhelming response of the exhibitors from 27 districts under RVSKVV, Gwalior. 73 participants were registered with their exhibits under various categories of Rajvijay Fulwari 2020.

The flower exhibition displayed various stalls like preserved fruit (16), fruits in basket (41), seasonal flowers (18), floral decoration (10), vegetables in basket (62), bonsai and land scap (24), seasonal cut flowers-Rose (31), ornamental in pots (22) and home garden (24) exhibits during the event for judgment by the various committee of experts constituted.

The farmers and institutions were awarded with awards for the quality display of their products and items under various categories after the evaluation by the various evaluation committees at the end of the programme. Total 103 and 82 first prizes respectively were given for the different exhibits displayed by the participants. 62 exhibits were judged for consolation certificate under various categories. The event was visited by more than 3600 visitors.

2.6 राट्रीय कार्यशाला – कृषि मौसम विज्ञान एवं 13th Annual Review Meeting of GKMS organised

Directorate of Extension Services, RVSKVV, Gwalior in collaboration with Department of Agrometeorology, Ministry of Earth Sciences, Government of India had organized 13th Annual Review Meeting of Gramin Krishi Mausam Sewa (GKMS) during December 18-20, 2019. Director General of IMD Dr. M. Mohapatra inaugurated the workshop in the chairmanship of Hon'ble Vice Chancellor Prof. S.K.Rao. More than 330 delegates from all the Indian states participated and presented their report in several technical sessions. The emerging issues of climate change and challenges for agro-advisories in the future were discussed through panel discussion and invited lead papers from renowned experts in the field.

The annual programme of 130 campuses under GKMS was reviewed in the meeting besides presentations of Dr. K.K. Singh and Dr. Manish Bhan in the house for effective uploading of meteorological information for timely issues of weather based advisories to the farmers in their respective areas. A one day training programme for the scientists and technical staff of District Agro Meteorological Unit (DAMU) was also organized on 21st December, 2019.

2.7 Swatch Bharat Abhiyan

SwachchtaDiwas and activities on keeping India cleanwere organized in all KrishiVigyanKendrasunder 'Swachcha Bharat Abhiyan' in which farmers and farm women were conveyed the message of cleanliness.

GLIMPSES OF ACTIVITIES BY KVKS AND DES, RVSKVV, GWALIOR

6. LIBRARY AND DOCUMENTATION SERVICES:

Library system of different constituent Colleges of Rajmata Vijayaraje Scindia Krishi Vishwa Vidyalaya, Gwalior continued to play the pivotal role in dissemination of information across the University.

Entire academic community continued to harness the benefits of this useful information system. Textbooks, Reference books, Competitive examination books, digital library e-books, scientific periodical, thesis, report, encyclopedias, CDs relevant to teaching and research activities etc. have been stocked in the library of constituent Colleges of the University.

Books and Journals available:

S.No.	Particulars	No. of books
1.	Total No. of books available in different College Library of Vishwa Vidyalaya.	1,36,566
2.	New books purchased during 2018-19	9239
3.	*e*-Books	-

Central Library: The fund provided by ICAR has been utilized by the Central Library of the University. The much awaited and highly needed books on various subjects have been purchased. The basic infrastructural facility has been developed that has made the academic atmosphere of the libraries more conductive for the research scholars, students and teachers alike. The computerization of all the e-libraries of Vishwa Vidyalaya has made the functioning smoother now, therefore each and every user is assisted promptly. The e-library is fully functional connecting the local user through World Wide Web to the global scenario of knowledge. The good quality book cases keep study material safe and intact, and the comfortable furniture is a kind of great relief to the voracious readers. In central library total Books are 10341, 9718 printed books, 139 e-books, 07 printed magazines, 1303 gifted books, 15 priented journal and 52 E-magazines were available in Central library of VishwaVidhyalaya.

7. INFRASTRUCTURE DEVELOPMENT:

(1) College of Agriculture, Gwalior:-

S. No.	Department	Infrastructure Development
1	Plant breeding & Genetics	Cytogenetic lab, seed Technology lab and Library
2	Plant Moleular Biology and Biotechnology	Strengthen Molecular Biology Lab, Biochemical lab and Tissue culture Lab at Biotechnology Centre

(2) College of Agriculture, Indore:-

S. No.	Name	Amount P.a.c. (lakhs)	Type/ complection
1.	Construction of boundary wall	14.00	Construction
2.	Construction of cattle shed	3.00	Construction
3.	Construction of seed hub	33.00	Construction
4.	Construction of additional room at girls hostel	20.00	Construction
5.	Construction of CC road at college campus	5.00	Construction
6	Construction of gate at college campus	5.14	Construction

(3) RAK, College of Agriculture, Sehore:-

- Construction of seed hub
- Construction of seed store
- Construction of boundry wall of girls hostel
- Construction of boundry wall near F quarters
- Renovation work of seminar hall
- Threshing floor/Open shed
- Vermicompost shed

Vermicompost Shed

Seed store

Boundry wall near F quarters

Threshing floor/Open shed

(4) BM, College of Agriculture, Khandwa: - The vision of the Institute is to "ensure good governance, flawless administration and sound human resource management to harness the full potential of the staff and the students so as to transform a process driven institution into a result oriented organization".

College Dispensary-The College has fully equipped Dispensary. Presently, the dispensary has a Medical Officer and a Peon. Agriculture College Dispensary is rendering quality medical services round the clock to students, staff and their family members, pensioners and their families. Besides, it shoulders medical accountabilities during seminars, conferences, Health Awareness Camps, routine health check-ups etc. Since the inception of the dispensary, medicines and other medical aid were provided free of cost.

Extension of sports complex "Parth"

Shelter shade near Polyhouse

Ambedkar Hall (Conference Hall)

A newly built conference hall with a sitting capacity of 75 was inaugurated by Hon'ble Vice Chancellor RVSKVV, Dr S.K. Rao with the name "Ambedkar Hall".

"Ambedkar" Conference Hall

Soil Science lab

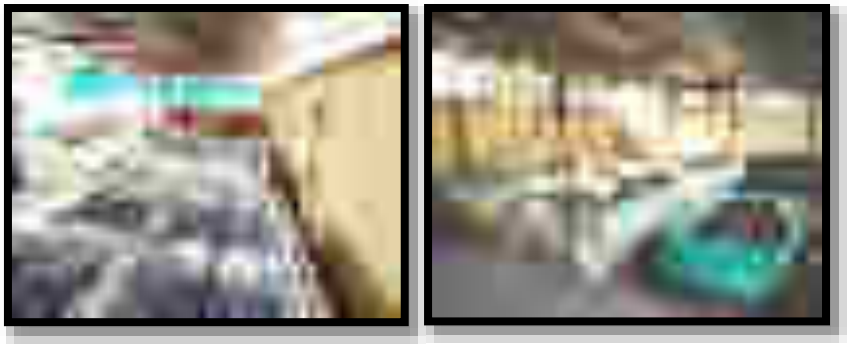
Pathology Lab

Gym strengthens–Physical exercise is important for maintaining physical fitness and can contribute positively to maintaining a healthy body. College also has a Gymnasium with latest machines like Cardio Equipment, strength equipment, Treadmill, Rehabilitation Upright Bike, Massager etc. Sports complex and Gym is presently used by students as well as by the staff for activity requiring physical effort, carried out to sustain or improve health and fitness. New Machines and other health equipments are purchased in order to strengthen Gymnasium.

Organic Turmeric Processing Unit: It is established at Cotton Research Centre, Khandwa. Organic turmeric is produced in the farm and this unit will help us in processing it to the final value added product. Good quality of organic turmeric is a great source of "*Curcumin*" which is good for health.

Organic Turmeric Farming and Processing Unit

Vermicompost: This unit is established at Cotton Research Centre, Khandwa and it consist of 12 beds for preparation of Vermicompost, which is used for organic Cotton and Turmeric production in the farm.Vermicomposting uses earthworms to turn organic wastes into very high quality compost, which give all essential micro and macro plant nutrients to plants. Worm casts contain five times more nitrogen, seven times more phosphorus, and 11 times more potassium than ordinary soil.



Vermi-compost unit at Cotton Research Centre

Organic Bio-char: A new Organic Bio-Char Box has been set in college research farm. It is used for carbon sequestration. The unit is established for preparing coal from crop (cotton) residuals. It will not only provide destroy crop residual but will be an additional source of income for the farmer community. It is also eco-friendly.

Organic Bio-Char

Madhav Goshala-B.M. College of Agriculture has cattle husbandry unit with 70 cattle's at cotton research centre and is known as "Madhav Gaushala". It is a large source of cow dung provider, which is supplied in making vermin-compost. Cow dung, urine can be used for making Jivamrut and organic pesticides.

The development works carried out at Gaushala.

- Construction of Cattle Shed.
- Construction of grass godown.
- Compound wall.

Cattles at Madhav Goshala

Initiatives towards Organic Farming: Two Vermi-compost units each at College farm and KVK premises have been established. Both the units have six pits and production of vermi-compost has already started and is being used for enriching the soils of the college farm. Besides, under *Krishi Teerth* plan, recently, a vermi-compost unit has also been established in which the compost is being made in open bed instead of pits. An area of one hectare has been earmarked for organic farming as per the directives of the VV. Since last three years organic crops like Cotton, Wheat, Arhar, Turmeric. Gram, Onion, Kinova, Maize, Watermelon, Moringa, Mango, Pomegranate and Custard apple have been cultivated without using any synthetic chemicals. Facilities for micro (drip) irrigation have also been established.

(5) KNK, College of Horticulture, Mandsaur

Infrastructure Development:- Facilities Developed at College level:

S. No.	Facility developed	Qty	Amount
1.	Sanitary incinerator for girls hostel	01	22,000/-
2.	Water tanks with pvc pipes etc. for drinking water facility in girls hostel	02	28,320/-
3.	Attendance machine for PG students of the college	04	26,800/-
4.	Water filter for girls hostel	01	9900/-
5.	Water tanks with accessories for water supply in college	04	45225/-
6.	Print books purchased for library	450	200,000/-

Facilities Developed at department level:
Name of Department:

S. No.	Name of the Deparment	Facilities Developed (equipment purchased)	Qty	Cost
1.	For fruit science deptt.	Pruning chain saw	01	16986/-
2.		Brush cutter	01	19501/-
3.		Luper shear	05	3513/-
4.	For veg. science deptt.	Precision balance	01	20907/-
5.		Thermohygrometer	01	2912/-
6.		Infrared Thermometer	01	19990/-
7.	For plantation, spices deptt.	Spray pump	01	5180/-
8.	For plantation, spices deptt.	Water pump	01	9906/-
9.	For plantation, spices	Weighing machine	01	8614/-

10.	deptt.	Starter	01	4600/-
11.		Mixer	01	2800/-
12.		Dryer	01	3100/-
13.		Spray pump	01	15160/-
14.	For post-harvest deptt.	Solar dryer	01	15015/-
15.		Bottle washing machine	01	15545/-
16.	PHM Lab	✓ Chemical analysis for percent reducing sugar, non-reducing and total sugar, percent acidity, percent ascorbic acid, pyruvic acid (micro mole/gram), organolaptic evaluation (colour, texture, taste, flavour) e.t.c. ✓ Preparation and preservation of various value added products i.e. Beal Candy, Aonla Candy and Blended RTS	NA	NA

Glimpses

Entrepreneurship development in Mushroom Production, Processing and Marketing

Training on Honey Bee Keeping

8. GENERAL ADMINISTRATION:

8.1 **General Administration:** The Board of Management (BoM) of RVSKVV is the apex-body, empowered to make policy decisions with the Vice-Chancellor as its Chairperson who is also the Executive Head of the University. The composition of BoM is given below:

BOARD OF MANAGEMENT

S. No.	NAME AND ADDRESS OF MEMBERS
1	Principal Secretary Farmer Welfare and Agriculture Development MP Govt., Mantralaya, Vallabh Bhawan, Bhopal (M.P.)
2	Secretary Department of Finance MP Govt., Mantralaya, Vallabh Bhawan, Bhopal (M.P.)
3	Deputy Directore General (Agril. Eduaction) ICAR, KAB-II, Pusa, New Delhi
4	Dr. Vijay Singh tomar Ex. Vice-Chancellor (RVSKVV/JNKVV) DH-33 A, DD Nagar, Morar, Gwalior (M.P.)
5	Dr. O.P. Mathuriya Agriculture Scientist C-333, Kailash Vihar, AV-1 Kalyanpur, Kanpur-208017 (U.P.)
6	Dr. Sushil Kumar Piyashi Agril. Engineear (SWE) College of Agriculture Engineering Aadhartal, Jabalpur (M.P.)
7	Sh. Praveen Kumar Shinde F-108/29, Shivaji Nagar, Bhopal (M.P.)
8	Sh. Shivraj Sharma Bal Niketan Road Gandhi Colony, Morena (M.P.)
9	Sh. Ranjeet Singh Rana H-32, Purani Court Ghasmandi, Morar, Gwalior (M.P.)
10	Dr. Sunanda Singh Raghuwanshi E-7/59, SBI Colony, Arera Colony, Bhopal (M.P.)

ACADEMIC COUNCIL

The Academic Council is vested with the responsibility of implementing and monitoring all the academic programmes. The council is headed by the Vice-Chancellor, as chairperson and consists of Dean Faculty, Director Instructions, Director Research and Director Extension, University Head of Departments and Professors as members. The composition details are given below:

S. No.	NAME AND ADDRESS OF MEMBERS	OFFICIALS
1	Dr. S.K. Rao Vice-Chancellor RVSKVV, Gwalior	**Chairman**
2	Dr. Mridula Billore Dean, Faculty of Agriculture RVSKVV, Gwalior	Member
3	Dr. B.S. Baghel Director, Research Services RVSKVV, Gwalior	Member
4	Dr. R.N.S. Banafar Director, Extension Services RVSKVV, Gwalior	Member
5	Dr. A.K. Singh Director, Instructions and Dean, Student Welfare RVSKVV, Gwalior	Member
6	Dr. A.K. Singh Managing Director, National Horticulture Board Ministry of Agriculture and Farmer Welfare, Govt. of India 85, Institutional Area, Sector-18, Gurgaon-122012 (HR)	Member
7	Dr. Rajpal Singh Former Professor and Head 278-A, Durgesh Vihar, J.K. Road, Bhopal-462041 (M.P.)	Member
8	Shri D.L. Kori Registrar, RVSKVV, Gwalior	**Member Secretary**

ADMINISTRATIVE COUNCIL

S. No.	NAME AND ADDRESS OF MEMBERS	OFFICIALS
1	Dr. S.K. Rao Vice-Chancellor RVSKVV, Gwalior	**Chairman**
2	Dr. Mridula Billore Dean, Faculty of Agriculture RVSKVV, Gwalior	Member
3	Dr. B.S. Baghel Director, Research Services RVSKVV, Gwalior	Member
4	Dr. R.N.S. Banafar Director, Extension Services RVSKVV, Gwalior	Member
5	Dr. A.K. Singh Director, Instruction and Student's Welfare RVSKVV, Gwalior	Member
6	Two Dean colleges nominated by the Vice-Chancellor for a period of two years by rotation- 1. Dean, College of Agriculture, Gwalior. 2. Dean, College of Agriculture, Indore.	Member
7	Dr. (Smt.) Sugandhi Tiwari Comptroller RVSKVV, Gwalior	Member
8	Dr. H.S. Bhadauria Executive Engineer/In-charge of Work section RVSKVV, Gwalior	Member
9	Two Heads of Department from Agriculture Faculty by rotation according to the seniority for a period of two year- 1. Head of Department (Extension Education). 2. Head of Department (Genetics Pl. Breeding).	Member
10	Shri D.L. Kori Registrar, RVSKVV, Gwalior	**Member Secretary**

9. IMPORTANT EVENTS/INAUGURATIONS:

Republic Day

RVSKVV, Gwalior celebrated 70th Republic Day on January 26, 2019. Prof S.K. Rao, Hon'ble Vice Chancellor hoisted the tricolor in the presence of senior officers, invitees, staff members and students. He also addressed the gathering.

Occasion of Martyr's Day

On the occasion of Martyr's Day tributes were paid to late Rajmata Vijayaraje Scindia on January 25, 2019 at the Vishwa Vidyalaya Campus by Hon'ble Vice-Chancellor, senior officers and staff members.

150th Birth Anniversary of Mahatma Gandhi Celebrated

Various activities are being conducted in all the colleges by the staff and students to pay tributes to the Father of the Nation, **Mahatma Gandhiji**. The activities including visit to industries of the students to have industrial experience for self-employment; lectures on cleanliness, self-employment and women empowerment by subject experts and social activists; Human Resource Development; Hands on practice on Nursery management, preparation of vermin composting and Blood/ Checkup Camps *etc.* were organized.

International Yoga Day (June 21, 2019)

University headquarter, all constituent colleges and KVKs under the jurisdiction of the university celebrated Fifth International Yoga Day on June 21, 2019. Senior officers and Staff members participated in Yoga programme organized at various campuses.

Sixth Convocation

The Sixth Convocation of Rajmata Vijayaraje Scindia Krishi Vishwa Vidyalaya, Gwalior was held on October 22, 2019. Hon'ble Shri Lalji Tondon, the Governor of Madhya Pradesh and Chancellor of Universities presided over the function. Hon'ble Dr. Mangla Rai, Former Secretary DARE and DG, ICAR, New Delhi delivered the convocation address. Shri Sachin Subhash Yadav, Hon'ble Minister, Farmer Welfare and Agriculture Development, Govt. of M.P. was Chief Guest. Prof. S.K. Rao, Vice Chancellor presented the university progress report. A total of 521 students were awarded UG, PG and Ph.D. degrees, five students received Gold Medals and 3 students received **Sirtaj Bahadur Sinha Memorial** Cash Prize.

Foundation Day

11th Foundation Day of University was celebrated on August 19, 2019 in the gracious presence of Dr. Arvind Kumar, Hon'ble Vice Chancellor, Rani Laxmi Bai Central Agricultural University, Jhansi (U.P.) as Chief Guest of the function. Shri Munna Lal Goyal, Hon'ble MLA, Gwalior & Board Member and Shri Ranvir Jatav, Hon'ble MLA & Board Member were present as Special Guests. Hon'ble Vice Chancellor, Prof S.K. Rao highlighted the University's achievements.

Independence Day

RVSKVV, Gwalior celebrated Independence Day on August 15, 2019. Prof. S.K. Rao, Hon'ble Vice Chancellor unfurled the Tricolor in the presence of senior officers, invitees, staff members and students.

WHAT'S NEW ?

University Ranking

ICAR Ranking-2018: University is ranked number 19 amongst Agriculture Universities.

10. HUMAN RESOURCE DEVELOPMENT:

Participation of Scientist in National/International Seminars/Symposia/ Conferences/ Short term Courses /Trainings/Workshops/Summer and Winter Schools etc.

S. No.	Title of training	No. of participants nominated
1.	Summer/Winter Schools	28
2.	National/International/Seminars/Symposia/Conference	3
3.	Short term courses	8
4.	Workshop	7

11. AWARDS AND RECOGNITIONS BY COLLEGES:

(1) College of Agriculture, Gwalior-

S. No.	Name of Scientists	Name of award	Name of Society/ Agency
1	Dr.V.S.Kandalkar	Best teacher award of the year	Gwalior Vikas Samiti,Gwalior
2	Dr Sushma Tiwari	Chaudhary Charan Singh Award	Global Environment and Social association (GESA), New Delhi
3	Dr Sushma Tiwari	Fellow Award	Global Environment and Social association (GESA), New Delhi

(2) College of Agriculture, Indore- Dr. Swati Barche get BIOVED YOUNG SCIENTIST ASSOCIATE AWARD 2020 on the 22nd Agricultural Scientists and Farmers Congress on PHT & Management for empowering the rural society and Employment Generation on 22-23 Feb, 2020 at Prayagraj.

(3) KNK, College of Agriculture, Mandsaur-

1. Dr. Rajiv Dubey received Best Participant Award in ICAR sponsored 21 days (03-23 October, 2019) training (based on evaluation tests and training performance) organized by Department of Soil and Water Engineering, College of Technology and Engineering, MaharanaPratap University of Agriculture and Technology, Udaipur (Rajasthan) at MPUAT, Udaipur, Rajasthan.
2. Patel R. P; Singh S. B; Kanpure, R. N. and Patidar, B. K. received second poster award with title of poster effect of abiotic factors on occurrence of fruit rot disease on ambebahar guava(Psidiumguajava L) caused by PhytophthoranicotianaeVarParasitica (Dastur) Waterhouse on the occasion of International conference on Global Research Initiatives for Sustainable Agriculture & Allied Sciences (GRISAAS- 2017) during 20-22 October, 2019 at ICAR-National Academy Of Agricultural Research Management, Hyderabad, Telangana (India).
3. Patel R. P. awarded with Fellow award for outstanding contribution in the field of Plant Pathology by Society for Scientific Development in Agriculture and Technology, on the occasion of International Conference on GRISAAS-2019 during 20-22 October, 2019 heldat ICAR-National Academy of Agricultural Research Management, Rajendranagar, Hyderabad, Telangana, India
4. Dr. S.K. Dwivedi awarded with "Young Scientist Award-2019" in the field of Post-Harvest & Technology. During "1st Foundation Day Program was organized during 20 June 2019 at the auditorium of ICAR-Indian Institute of Sugarcane Research (IISR), Lucknow, Uttar Pradesh.
5. H C Bharvey awarded with Excellence in Communication Award given by (SSDAT) GRISAAS -2019 during 20-22 October,2019 held at ICAR-National Academy of Agricultural Research Management, Rajendranagar,HyderabadTeangana,India.

12. VISITS ABROAD: Nil

13. DISTINGUISHED VISITORS:

S. No.	Name	Designation	Date
01	Dr.Sunanda Raghuwanshi	Board Member	22/10/2020
02	Dr Mangala Rai	Former DG, ICAR	21/10/2020
03	Dr.A.S. Kharab	Project Coordinator (Barley Wheat)	04/03/2020
04	Dr.S.R.Pancholi	Principal Scientist	04/03/2020
05	Dr.P.S. Shekhawat	Principal Scientist	04/03/2020
06	Dr.Dinesh Kumar	Principal Scientist	04/03/2020
07	Dr.H.S.Yadav	Ex. DRS, RVSKVV, Gwalior	20/09/2019
08	Dr.Rachit Saxena	Sr.Scientist,(ICRISAT, Hydrabad)	07/10/2019
09	Dr. Shyam Sundar Choudhary	Professor and Head , MPUAT, Plant Pathology	25.09.19
10	Dr. M.S. Shankar,	Former, Director Research Services, University of Agricultural Sciences, GKVK, Bangalore	8-6-2019

11. Hon'ble Agriculture Minister Mr. Sachin Yadav Govt. of M.P visited this chickpea project, field and interacted with scientists of the project on 04.09.2019.
12. Dr. M.P. Jain DRS, RVSKVV Gwalior visited MULLaRP project, field and interacted with scientists of the project on 07.09.2019
13. Dr. N.P. Singh Director, IIPR, Kanpur visited MULLaRP project, field and interacted with scientists of the project on 09.11.2019
14. Dr. A.K. Singh Director Instruction, RVSKVV, Gwalior experimental area and PG students of Deptt. Of Plant breeding discussed with students of PG students of the department on 22.01.2020
15. Dr. Sanjeev Gupta, PC (MULlaRP) IIPR, Kanpur and Dr. Shiv Kumar, Lentil Breeder ICARDA visited MULlaRP project, field and interacted with scientists of the project on 13.02.2020.
16. Director Indian Institute of Soybean Research, Indore, Dr. V.S.Bhatia and Dr. S.D.Billore PI Soybean Agronomy visited on 27/9/2019

S.No.	Name of dignatory	Designation	Period	Purpose
17.	Dr. R.G Somkuwar	Director, NRC grapes	17-18 February,2020	Field day and AICRP Experiments visit
18.	Dr. Ajay Kumar Upadhyay,	Principal Scientist (Soil Science) Principal Scientist (Soil Science), Pune	17-18 February,2020	Field day and AICRP Experiments visit

19.	Dr. Roshni Samrath	Scientist, NRC grapes, Pune	17-18 February,2020	Field day and AICRP Experiments visit
20.	Dr. S. N. Upadhyay	DES, RVSKVV, Gwalior	22-23 November, 2019	Monitor extension activities
21.	Dr. P. Manivel	Ex. Director and Principle Scientist, Plant Breeding DMAPR, Anand Guj.	11, Dec. 2019	To Survey and identify the Isabgol and Medicinal Plants growing area

14. PUBLICATIONS:

Research papers/Abstract (Presented & Published)/Books/Book Chapters/ Teaching Manual/ Popular Articles etc.

S. No.	Category of publication	Nos
1	Papers Published in National and International Journals	117
2	Abstract published in various conference/souvenir	30
3	Books	13
4	Practical Manual/Articals	12
5	Book Chapter	14

14.1 Papers Published in National and International Journals:

S. No	Author (s)	Title	Journal	Volume	Page No.	Year	NASS Rating	JID	ISSN	National / International
1	Gupta Varsha, Joshi Ekta, Sasode Deep Singh, Singh Lakhan, Kasana B.S. and Singh Y.K.	The Effect of Chemical and Non-Chemical control methods on weeds and yield in potato (*Solanum tuberosum* L.) cultivation under potato based organic cropping system.	*International Journal Current Microbiology and Applied Sciences*.	8 (7)	2737-2747	2019	5.38			International
2	Sasode, D.S, Joshi Ekta, Gupta Varsha, Kasana B.S. and Singh Y.K.	Weed flora dynamics and growth response of green gram (*Vigna radiata* L.) to weed management practices.	*International Journal Current Microbiology and Applied Sciences*	9 (4)	365-370	2020	5.38			International

3	**Joshi Ekta, Sasode D.S., Sikarwar R.S., Gupta Varsha and Kasana B.S.**	**Optimizing crop geometry and nutrient management for yield, water productivity and economics of kharif groundnut (*Arachis hypogaea* L.)**	***Legume Research***	**42 (5)**	**676-679**	**2019**	**6.23**			**national**
	Tomar Bhavna, Sasode D.S., Bhadauria S.S., Tomar Sudeep Singh and Tomar Shobhana	**Effect of different dates of sowing on growth and yield of pearlmillet (*Pannisetum glaucum* L.) varieties under semi-arid region**	***International Journal of Chemical Studies***	**8 (1)**	**2198-2202**	**2020**	**5.31**			**International**
4	**Singh Neelam, Joshi Ekta, Sasode D.S., Roop Singh Dangi and Namrata Chouhan**	**Soil fertility, macro and micro nutrients uptake and their use efficiencies under integrated nutrient management in groundnut (*Arachis hypogaea* L.).**	***International Journal of Chemical studies***	**8(1)**	**1983-1987**	**2020**	**5.38**			**International**
5	**Sasode D.S., Joshi Ekta, Jinger Dinesh, Sasode Rajni Singh, Gupta Varsha and Singh Y.K.**	**Conservation tillage and weed management practices effect on weeds, yield and profitability of cowpea (*Vigna unguiculata*).**	***Indian Journal of Agricultural Sciences***	**90 (1)**	**86-90**	**2020**	**6.23**			**national**
6	**Gupta V, Sharma S, Sasode D.S., Joshi E, Kasana BS and**	**Efficacy of herbicides on weeds and yield of greengram**	**Indian Journal of Weed Science**	**51(3)**	**262 – 265**	**2019**	**5.17**			**national**

	Joshi N.									
8	**Bobde A., PP Shastry P. P. , Patidar J. K., Singh Reeti and Pandya**	**Survey of anthracnose of chilli: A potential threat to chilli crop in major chilli growing districts of Madhya Pradesh**	**International Journal of Chemical Studies**	**7(5)**	**1917-1919**	**2019**	**5.31**	**I185**	**2321-4902**	**International**
9	**Singh P. K, Patidar J K, Singh R., Roy S and Pandya RK**	**Evaluation of culture media for the growth ofRhizoctoniasolani causing black scurf of potato**	**International Journal of Chemical Studies 2019; 7(5): 1917-1919**	**7 (5)**	**2189-2192**	**2019**	**5.31**	**I185**	**2321-490**	**International**
10	**Singh Priyanka, Parhiar Prerana and Pandya RK**	**Management of Pearl millet through foliar application of cow urine, selective chemicals and botanicals**	***Journal of Pharmacognosy and Phytochemistry***	**8 (4)**	**546-547**	**2019**	**5.21**	**S/2042/SDM/NW/2014)**	**2349-8234**	**National**
11	**Singh Priyanka, Parhiar Prerana and Pandya RK**	**Evaluation of culture media for the growth of *Pyriculariagrisea* causing blast of pearl millet**	***International Journal of Chemical Studies***	**7(3)**	**831-833**	**2019**	**5.31**		**ISSN: 2349-8528**	**International**
12	**HarneAmol , Singh Reeti and Verma Deepak Kumar.**	**Integrated management of dry root rot of clusterbean incited by *Rhizoctoniabataticola* (Taub.) Butler**	**International Journal of Chemical Studies**	**7(5)**	**72-74**	**2019**	**5.31**		**ISSN: 2349-8528**	**International**
13	**HarneAmol , Singh Reeti and Verma Deepak Kumar**	**Bioefficacy of antagonist on mycelial growth of *Rhizoctoniabataticola* by dual culture technique**	**International Journal of Chemical Studies**	**7(3)**	**4849-4851**	**2019**	**5.31**		**ISSN: 2349-8528**	**International**

14	**Verma, D.K. Sasode, S. Rajni and Harne A.R.**	**Screening of promising genotypesof Clusterbean against *Colletotrichumcapsici* f.sp. *cyamopsicola* under field condition.**	***Inter. J. Curr. Microbiol. App. Sci***	**8 (2)**	**3002-3004**	**2019**	**5.38**		**ISSN:2319-7692**	**International**
15	**Verma, D.K. Sasode, S. Rajni and Harne A.R. and Singh Reeti,**	**Survey forseverity of anthracnose of cluster bean in northern Madhya Pradesh.**	***J. Pharmacognosy and Phytochemistry***	**8 (1)**	**1043-1044**	**2019**	**5.21**		**ISSN:2349-8234**	**National**
16	**Parihar, P.; Singh, P. and Pandya, R.K.**	**Survey of northern Madhya Pradesh pearl millet.**	***Journal of Pharmacognosy and Phytochemistry***	**8(5)**	**412-413**	**2019**	**5.21**		**ISSN: 2349-8234**	**National**
17	**Parihar, P.; Singh,P. and Pandya R.K**	**Performance of promising hybrids and varieties of pearl millet against blast (*Pyriculariagrisea***	***International Journal of Chemical Studies***	**7(1)**	**1837-1838**	**2019**	**5.31**		**ISSN: 2349-8528**	**International**
18	**Anupriya, Sasode, S. Rajni and Prahlad,**	**Management of *Alternaria cucumerinavar. cyamopsidis* through plant extracts, bio products and fungicides *in vitro* and *in-vivo*.**	**Inter. J. Curr. Microbiol. App. Sci.**	**9(3)**		**2020**	**5.38**		**ISSN:2319-7692**	**International**
19	**Purnima Singh Sikarwar and K. S. Tomar**	**Nutrient management study in sweet orange (*Citrus sinensis* L) cv. Mosambi**	**Journal of Pharmacognosy and Phytochemistry**	**7(2)**	**2217-2219**	**2018**	**5.21**		**2278-4136**	
20	**Purnima Singh Sikarwar and K. S. Tomar**	**Effect of micronutrients on growth, yield and quality parameters of Sweet Orange (*Citrus sinensis* L.) cv. Mosambi**	**International Journal of Current Microbiology and Applied Sciences**	**7(4)**	**1-9**	**2018**	**5.38**		***2319-7706***	

21	**Rajkumar Deshlehra, Karan Veer Singh, Rajesh Lekhi and S.K. Singh**	**Effect of growth regulators, micronutrients and chemicals on yield attributes and economics of acid lime cv-Vikram in Ambebahar under high density planting system (*Citrus aurantifolia* Swingle)**	**Journal of Pharmacognosy and Phytochemistry**	**8(6)**	**549-551**	**2019**	**5.21**		**2278-4136**	
22	**Rajkumar Deshlehra, Karan Veer Singh, Rajesh Lekhi and Jagati Yadagiri**	**Effect of growth regulators, micronutrients and chemicals on reproductive and quality of acid lime cv-Vikram in Ambebahar under high density planting system (*Citrus aurantifolia* Swingle)**	**Journal of Pharmacognosy and Phytochemistry**	**8(6)**	**552-554**	**2019**	**5.21**		**2278-4136**	
23	**Richa Pyasi, A.K. and R.P. Singh**	**Effect of different levels of NPK and FYM on growth and yield of potato**	**International Journal of Current Microbiology and Applied Sciences**	**8(10)**	**2713-2718**	**2019**	**5.38**		***2319-7706***	
24	**Richa Pyasi, A.K. and R.P. Singh**	**Effect of inorganic fertilizer and biofertilizers on growth, yield and quality of potato**	**International Journal of Chemical Studies**	**7(5)**	**1773-1776**	**2019**	**5.31**		***2349-8528***	
25	**Deepa Bhatt, Karan Vir Singh, A.K. Barholia and Devendra Vishvkarma**	**Effect of fertilizer application and spacing on the Growth and yield of Taro (*Colocasia esculenta* (L.) Schott**	**International Journal of Current Microbiology and Applied Sciences**	**8(12)**	**2857-2865**	**2019**	**5.38**		***2319-7706***	

26	**Deepa Bhatt, Karan Vir Singh, A.K. Barholia and Devendra Vishvkarma**	**Effect of different levels of fertilizer and plant spacing on the quality parameters of Taro (*Colocasia esculenta* (L.) Schott**	**Journal of Pharmacognosy and Phytochemistry**	**8(6)**	**481-483**	**2019**	**5.21**		**2278-4136**	
27	**Bharat Lal, N.S. Bhadauria, Pradyumn Singh and S.P.S. Tomar**	**Seasonal incidence of sucking insect pests in brinjal and their natural enemies in gird region of Madhya Pradesh, India.**	**Journal of Pharmacognosy and Phytochemistry**	**8(4)**	**2077-2079**	**2019**	**5.21**			**International**
28	**Gautam S., Tomar S.P.S., Singh P.D., Suryawanshi D.K., and Singh U.C.**	**Screening of brinjal (solanum melongena L.) varieties against insect pest complex.**	**Intern. J. Agri. Sci.**	**11; 07**	**8180-8182**	**2019**	**4.82**			**International**
29	**Tarun Kumar, SPS Tomar, Pradyumn Singh, NKS Bhadauria, and NS Bhadauria**	**Seasonal incidence of major insect pests of soybean in gird region central India.**	***Journal of Entomology and Zoology Studies***	**7 (1)**	**447-450**	**2019**	**5.53**			**International**
30	**Tarun Kumar, SPS Tomar, NKS Bhadauria, Pradyumn Singh and NS Bhadaur**	**Efficacy of insecticides against major insect-pests of soybean in gird region at central India**	***International Journal of Chemical Studies*.**	**7 ; 2**	**13-18**	**2019**	**5.31**			**International**

	ia									
31	**Bharat Lal, N.S. Bhadauria and S.P.S. Tomar**	**Biology and Morphometics of Plume Moth, Exelastis atomosa (Wals.) on Pigeonpea Variety- Saket under Laboratory Conditions in Gwalior, Madhya Pradesh Region, India**	***Int.J.Curr. Microbiol. App.Sci***		**1880-1886**	**2019**	**5.38**			**International**
32	**Sulekha Kesari, Shashi S Yadav, PA Khambalkar**	**Effect of fertility levels and varieties on growth and forage yield of cluster bean (Cyamopsis tetragonolobus L.**	**Int. J. Chem. Stud.,;**	**7 (4),**	**1066-1071**	**2019**	**5.31**		**ISSN: 2321-4902, Print ISSN: 2349-8528**	**International**
33	**Priyadarshani A. Khambalkar , Shashi S Yadav**	**Soil health: importance and assessment.**	**Journal of Experimental Zoololgy India**	**20 (4),**	**1-4**	**2019**	**5.51**		**ISSN : 0972 - 0030**	**National**
34	**Vikas Baghel,Jyoti Kumar Thakur, Shashi S. Yadav,Madhab Chandra Manna,Asit Mandal, Abhay Omprakash Shirale, Poonam Sharma, Nishant K. Sinha,Monoranjan Mohanty**	**Phosphorus and Potassium Solubilization From Rock Minerals by Endophytic Burkholderia sp. Strain FDN2-1 in Soil and Shift in Diversity of Bacterial Endophytes of Corn Root Tissue with Crop Growth Stage**	**Geomicrobiology Journal,)**	**Volume 37, - Issue 6**	**550-563**	**2020**	**7.71**	**G032**	**ISSN 1947-5705**	**International link: https://doi.org/10.1080/01490451.2020.1734691**

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35	**Bhoopendra Singh et al.,**	**Elevated CO2 Chlorpyrifos and biochar influence nitrification and microbial abundance in the rhizosphere of wheat cultivated in a tropical vertisol**	**Rhizosphere**	**10**	**1-8**	**2019**	**5.38**	**-**	**24522198**	**International**
36	**Nargawe, L.and Y.D.Mishra**	**Association of socio-persnol attributes of the beneficiaries with impact of KMA**	**Community Mobilization and sustainable Development.**	**14 (3)**	**467-472**	**2019**				**National**
37	**Vinod Kumar Sahu, Sushma Tiwari, M. K. Tripathi, Neha Gupta, R. S. Tomar and M Yasin**	**Morpho-physiological and biochemical traits analysis for Fusarium wilt disease using gene-based markers in *desi*and *Kabuli* genotypes of chickpea (*Cicerarietinum*L.)"**	**Indian Journal of Genetics & Plant Breeding**	**-**	**-**	**2020**	**6.47**	**ED – 1494/2020**	**0019-5200**	**National**
38	**Vinod Kumar Sahu, Sushma Tiwari Neha Gupta, M K Tripathi and M Yasin**	**Evaluation of physiological and biochemical contents in Desi and Kabuli chickpea.**	**Legume Research**				**6.34**		**0250-5371**	**National**
39	**RakeshBhowmick, Sushma Tiwari, Vandana Rai, and Nagendra Kumar Singh**	**Diffential Expression and Co-location of Prohibitin Family Genes in Salt-tolerance QTL Regions of the Rice Genome"**	**The Indian Journal of Agricultural Sciences**				**6.25**			**National**

40	Bhawar, P. C., Tiwari, S.,Tripathi, M. K., Tomar, R. S., &Sikarwar, R. S.	Screening of Groundnut Germplasm for Foliar Fungal Diseases and Population Structure Analysis Using Gene Based SSR Markers.	Current Journal of Applied Science and Technology,	39(2),	75-84		5.32			International
41	Adlak T, Sushma Tiwari, Tripathi MK, Neha Gupta, Vinod Kumar Sahu, Punamchand Bhawar, Kandalkar VS. Biotechnology	An advanced tool for crop improvement	Current Journal of Applied Science and Technology	33(1)	1-11	2019	5.35			
42	Kaur I. B:, Barche. S.: Kaur, M and Asati, K.P	Assessment of the Correlation and Path Analysis with Association of Growth and Yield Characteristics in Okra.	IJCMB AS):	8(5	2331-2338	2019	5.38	4.119	.	International
43	. Kaur I. B:, Barche. S.: Kaur, M and Asati, K.P.	Study of different parameters of genetic variability and performance of various genotypes in Okra.	International Journal of Chemical Studies	7(3)	382-384	2019	5.31	0.565		Innternational
44	Bhanuja Dwivedi, Garima Diwan and K.P.Asati	ct of PGR's and theirmethods of applicationon growth of kharif OnionCv.ADR	IJCMB AS	8 (9)	1597-1610	2019	5.38	4.119		International
45	Bhanuja Dwivedi and K.P.Asati	Effect of PGR's and theirmethods of applicationon yield , quality and economics of kharif	The pharma Innovation journal	8 (10)	70-73	2019	5.03			

		OnionCv.ADR								
46	**Jain, N., Choudhary, S., Wankhede , A.,Barche, S and Jain,S.K.**	**Adoption Behavior of Orange Producer under National Horticulture Mission (NHM) at Shajapur district of M.P.**	**SSRG Int. J. Agric. & Environ. Sci**	**(5)**	**57-59.**	**2019**		**ISSN: 2394 – 2568**		
47	**Sinha N.K., Kushwaha h.S., Paliwal D.K. Sharma A.K. and Thakur N.S.**	**Integrated nutrient management in different type of maize in Malwa Plateau of Madhya Pradesh**	**Trends in Biosciences**	**12 (12)**	**879-886**	**2019**	**3.94**	**-**	**-**	**National**
48	**AMULER and Choudhary S.K.**	**Impact on land Configuration, Integrated Nutrient Management and Mulch on Different Cropping systems in Malwa Plateau in Madhya Pradesh.**	**International Journal of Agriculture Sciences**	**11 (5)**	**7999-8001**	**2019**	**4.20**	**-**	**-**	**International**
49	**Aakash, Lalita Bhayal, N.S. Thakur, Sudheer Kumar Kirar and S.K. Choudhary**	**Energetics of maize production system as influenced by varieties and nitrogen scheduling**	**Journal of Experimetal Biology and Agricultural Sciences**	**7(5)**	**462-467**	**2019**	**5.07**	**-**	**-**	**National**
50	**Kumawat N., Yadav R.K., Bangar K.S., Tiwari S.C., Morya J. and Kumar R**	**Studies on Integrated Weed Management Practices in Maize: A review.**	***Agricultural Reviews***	**40 (1)**	**29-36**	**2019**		**-**	**-**	**National**

51	**Khandkar, U.R., Tiwari, S.C. Kumawat N., Awani K. A., Bangar K.S. and Singh S.P.**	**Response of micronutrients, organics and biofertilizers on growth and yield of soybean under Vertisols.**	***Journal of Experimental Zoology***	**20 (10)**	**108-111**	**2019**		**-**	**-**	**National**
52	**Kumawat N., Tiwari S.C., Bangar K.S., Khandkar U.R., Awani K. Ashok and Yadav, R.K.**	**Influence of different sources of plant nutrients on soil fertility, nutrient uptake and productivity of soybean under Vertisols.**	***Legume Research,* DOI: 10.18805/LR-4164**			**2019**		**-**	**-**	**National**
53	**Bharat Singh, Shweta Pawar, Ashok Sharma, N.S. Thakur and Rini Shrivas**	**Effect of organics and inorganics on soil properties - A step towards nutrient management in Vertisols of Malwa Region.**	**International Journal of Current Microbiology and Applied Sciences**	**10**	**1-10**	**2020**	**5.38**	**-**	**-**	**International**
54	**Shweta Pawar, Bharat Singh, N.S. Thakur, Ashok Sharma, and Rini Shrivas**	**Integrated Nutrient Management – A remedy for enhancing the lives of Microbes in soil.**	**International Journal of Current Microbiology and Applied Sciences**	**10**	**11-15**	**2020**	**5.38**	**-**	**-**	**International**
55	**Shweta Pawar, Bharat Singh, Ashok Sharma, N.S. Thakur and Rini Shrivas**	**Nutrient Management Practices for Enhancing Soybean Production in Rainfed condition.**	**International Journal of Current Microbiology and Applied Sciences**	**10**	**16-23**	**2020**	**5.38**	**-**	**-**	**International**

56	**Rini Shrivas, Bharat Singh, N.S. Thakur, Ashok Sharma and Shweta Pawar**	**Reduced tillage and use of organics: A progressive manoeuvre towards conservation of resources and improvement in soil intrinsic properties**	**International Journal of Current Microbiology and Applied Sciences**	**10**	**24-35**	**2020**	**5.38**	**-**	**-**	**International**
57	**Singh A.K., Singh R.S., Singh A.K., Kumar R., Kumawat N., Singh N.K., Singh, S.P. and Shanker R.**	**Effect of weed management on weed interference, nutrient depletion by weeds and production potential of long duration pigeonpea (*Cajanus cajan* L.) under irrigated.**	***International Journal of Current Microbiology and Applied Sciences***	**9(1)**	**676-689.**	**2020**				**International**
58	**Kumawat N., Yadav R.K., Singh M., Dudwe T.S. and Tomar I.S.**	**Effect of phosphorus and bioinoculants and their residual effect on succeeding chickpea (*Cicer arietinum*) cropping system.**	***Indian Journal of Agricultural Sciences***	**90 (2)**	**320-325.**	**2020**				**National**
59	**Kumar R. Deka, B.C., Kumawat N. and Thirugnanavel A.**	**Effect of integrated nutrition on productivity, profitability and quality of french bean (*Phaseolus vulgaris*).**	***Indian Journal of Agricultural Sciences***	**90 (2)**	**431-435.**	**2020**				**National**
	Prashant Kumar, Dr. Abhay Wankhede, Dr.Sandhya Choudhary	**A Study on Scientific Temperament of Durum Wheat Growers Under Fld Conducted By Iari, Regional Station In Indore District Of Mdhya Pradesh**	**International Journal of Recent Scientific Research**	**Vol. 10, Issue, 05(C), pp.**	**32295-32299,**	**May, 2019**	**13.383 Impact factor-7.383**	**0976-3031**	**-----**	**International**

60	Mr. Bhupendra Chouhan, Dr. Sandhya Choudhary, Dr. Abhay Wankhede, Dr. K. S. Kumar	Adoption Behaviour of Beneficiary and Non- Beneficiary (FLD) Farmers of Green Gram Cultivation Khargone District of Madhya Pradesh	International Journal of Environment, Agriculture and Biotechnology (IJEAB)	Vol-4, Issue-5,	1404-1406	Sep-Oct-2019	9.118 Impact factor-3.118	2456-1878	-----	International
61	Mr.Krishnapal Chouhan, Dr. Sandhya Choudhary, Dr. Abhay Wankhede, Dr. K. S. Kumar	Women Empowerment Through Self Help Groups In Dhar District Of M. P.	International Journal of Innovative Research and Advanced Studies (IJIRAS)	Vol-6 Issue 9,	103-105	Sep-2019	6.239 Impact factor-0.239	2394-4404	-----	International
62	Mr.Anand Muleva, Dr Abhay Wankhede., Dr. Sandhya Choudhary,Dr.S. K.Jain	Entrepreneurial Behaviour of Tomato Producers under National Horticulture Mission (NHM) in Dhar district of Madhya Pradesh	IOSR Journal of Agriculture and Veterinary Science (IOSR-JAVS)	Volume 12, Issue 10 Serial. I	47-49	October -2019	9.26 Impact factor-3.26	2319-2380,	-----	International
63	Ms. Sonila Bhanvar; Dr. Sandhya Choudary; Dr. D.K. Verma; Dr. A. Wankhede	Impact on Sustainable Rural Livelihood of Integrated Watershed Management Program of Beneficiary Farmers in Khandwa District of Madhya Pradesh	International Journal of Advances in Agricultural Science and Technology,	Vol.6 Issue .10	40-44	October-2019	3.77	2348-1358	-----	International
64	Ms. Nishi Jain Dr Sandhya Choudhary, Dr.Abhay Wankhede Dr. Swati	Adoption Behavior of Orange Producer under National Horticulture Mission (NHM) at Shajapur district of M.P.	SSRG International Journal of Agriculture & Environmental Science (SSRG-IJAES) –	Volume 6 Issue 5 –	57-59	Sep - Oct 2019	7.47 Impact factor-1.47	2394 - 2568	-----	International

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65	Ms. Vaijanti Patidar; Dr. Sandhya Choudhary; Dr.D.K. Verma; Dr. Abhay Wankhede;Dr. S.K. Choudhary	Impact of Recommended Bio-Fertilizers Technologies on Yield of Soybean in Ujjain District of M.P.	International Journal of Advances in Agricultural Science and Technology,	Vol.6 Issue .10,	50-54	October-2019,	6.601 Impact factor-0.601	2348-1358	-----	International
66	Mr.Vikas Bhayal, Dr Abhay Wankhede., Dr. Sandhya Choudhary, Dr.S.K.Jain	Impact and Awareness of Soil Health Card with Reference to Maize Production in Dhar District of Madhya Pradesh	International Journal of Applied Agricultural Research	Volume 14, Number 2	79-85	2019	7.419 Impact factor-1.419	0973-2683	-----	International
67	Vaijanti Patidar Sandhya Choudhary Abhay Wankhede and S. K. Choudhary	Adoption of Recommended Bio-fertilizer Technologies among Soybean Growers in Ujjain District of Madhya Pradesh	Asian Journal of Agricultural and Horticultural Research	Volume 4 (4)	1-5	2019	9.928 Impact factor-3.928	2581-4478	-----	International
68	Neelesh Raypuriya, SB Das ,AK Bhowmick and Vibha	Mass multiplication of M. anisopliae on various substrates	Journal of Entomology and Zoology studies	7(2)	614-616	2019	5.53			National
	Neelesh Raypuriya, SB Das ,AK Bhowmick and Vibha	Compatibility of M.anisopliae with various adjuvants	Journal of Entomology and Zoology studies		544-547	2018	5.53			National

69	**Raypuriya N, Choudhary RK, Swathi P And Prajapati S**	**Influence Of Method And Application Time Of Nitrogen On Pest Incidence Of Sorghum, Sorghum Bicolor (L.) Moench Genotypes**	**International Journal of Bioresource and stress management**	**8(3)**	**413-417**	**2017**	**4.65**			**International**

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14.2 Abstract published in various conference/souvenir:

S. No	Author (s)	Title	Conference Proceedings	Page No.	Year	National / International
1	**Sasode D.S,** Gupta Varsha, Kasana B.S, Joshi Ekta, Singh Y.K. and Bhadauria V.P.S.	Management of *Cuscutaa reflexa* by different herbicides and its impact on yield of berseem (*Trifolium alexandrinum* L.) fodder crop.	ISWS Biennial Conference, 5-7 Feb. 2020 at ICAR- Central Coastal Agricultural Research Institute, Old Goa		**2020**	
2	**Sasode D.S,** Joshi Ekta, Gupta Varsha	Weed flora dynamics, growth and yield response of mustard (Brassica juncea L.) under conservation. Tillage and weed management practices	National Conference on Resource for soil Security and Jalshakti :, February 3-5, 2020 at ICAR-IISWC Research Centre, Datia (M.P.)		**2020**	
3	Gupta Varsha, **Sasode Deep Singh,** Joshi Ekta, Kasana B.S., Singh Y.K. and Bhaduaria V.P.S.	Weed management in sweet corn in maize based non-chemical cropping system.	ISWS Biennial Conference, 5-7 Feb. 2020 at ICAR- Central Coastal Agricultural Research Institute, Old Goa		**2020**	
4	Rawat, G.S., **Sharma, Janmejay** and Sasode Rajni	Seed Yield of clusterbean of as influenced by tillage and nutrient management practices.	National Seminar on Strategies for Soil Health Management Achievements & Researchable Issues March, 02-03, 2019.		**2019**	
5	**Sharma, Janmejay**, Tomar, S.S., Singh Ajay	Effect of weed control and nutrient management practices on NPK uptake by weed and	National Seminar on Strategies for Soil Helth Management		**2019**	

		crop in wheat.	Achievements & Researchable Issues March,02-03, 2019.			
6	Bharat lal, Bhaduaria n.s., **Tomar s.p.s.** and devendra vishvkarma	Seasonal incidence of sucking insect pests in brinjal and their natural in gird region of Madhya Pradesh, India.	GIASE- 2019	260	2019	**International**
7	**Dr. Shashi S. Yadav, Dr. Priyadarshani A. Khambalkar and Dr. S. K. Trivedi**	**Improve the livelihood of farmers of Madhya Pradesh via good quality fodder production**	**Symposium on "Physiological approaches to address environmental challenges for increasing animal productivity and farmer`s income" (18-19 February, 2020**	**136**	**2019**	**National**
8	**Jaya Rathore**	**Genetic Manipulation through induced mutation for high praline and high gum content**	MPCST, 34th MP. Young Scientist Congress, Bhopal	**09**	**2019**	**National**
9	**SushmaTiwari**	Morpho-physiological and molecular Assessment for foliar disease and oleic acid content using gene based SSR markers in groundnut (*Arachishypogea* L.)	**Plant Genomics**	**41**	**2019,June 13-14, 2019**	**International at Berlin Germany**
10	**Sushma Tiwari,** R S Tomar and M K Tripathi	Characterization and development of superior minor millets varieties for climate resilient adaptation	global conference on our biodiversity, our food and our health	Page 278	21 and 22 May 2019.	National botanical survey of India, Prayagraj (UP) during
11	Madhurjit Singh Rathore, **Sushma Tiwari,** M K Tripathi, Neha Gupta, S K Pooniya, Sunil Yadav and R S Sikarwar	Screening of groundnut genotype for early leaf spots and correlation with chlorophyll content	Recent Advances in Biotechnology and Nano biotechnology (Bionano-2020)	Page 26	25th February 2020	National Conferencehelld at Amity University, , Gwalior.

12	Mohan Lal Choudhary, M K Tripathi, **Sushma Tiwari**	Screening of Blast Disease in Pearl Millet (*Pennisetumglaucum* L.)	Recent Advances in Biotechnology and Nano biotechnology (Bionano-2020)	Page 27	25th February 2020	National Conference held at Gwalior.
13	Sajjan Kumar Pooniya, Sunil Yadav, Madhurjeet Singh Rathore, M K Tripathi, R S Sikarwar and **Sushma Tiwari**	Screening of Groundnut Germplasm for Early Leaf Spot Disease under Kharif field conditions	Recent Advances in Biotechnology and Nano biotechnology (Bionano-2020)	Page 31	25th February 2020	National Conference held at Gwalior.
14	Sunil Yadav, **Sushma Tiwari**, Neha Gupta, M K Tripathi, S K Pooniya, Madhurjit Singh Rathore and R S Sikarwar.	Biochemical estimations of groundnut germplasms for sugar, chlorophyll and carotenoid content	Recent Advances in Biotechnology and Nano biotechnology (Bionano-2020)	Page 33	25th February 2020	National Conference held at Gwalior.
15	Shivani Rana, Neha Gupta, M K Tripathi and **Sushma Tiwari**	Biochemical analysis of different Millet varieties for nutritional improvement	Recent Advances in Biotechnology and Nano biotechnology (Bionano-2020)	Page 33	25th February 2020	National Conference held at, Gwalior.
16	Kirad, K.S.,Barche, S and Gathiye,G.	Doubling the farmer's income byadopting the suitable tomato-cucurbit polyculture on the raised bed with drip system in the tribal dominating areas under Dhar district of Madhya Pradesh	22nd Agricultural Scientists & Farmers Congress (22-23 Feb,2020) on PHT and Management for Empowering the Rural Society and Employment Generation published in organized by Bioved Res. Institute of Agric. Tech & Sci. Prayagraj, U.P	-	2020	National
17	Gupta, A., Upadhyay, D and Barche,S	Standardization ofrecipe and preparation of mixed vegetable pickle	, published in 22nd Agricultural Scientists & Farmers	29	2020	National

			Congress (22-23 Feb,2020) on PHT and Management for Empowering the Rural Society and Employment Generation 22-23 Feb,2020 Souvenir & Abstracts			
18	Gour, S.,Patel, S and Barche, S	Standardization of different ingredients in spinach juice recipe	SAME	98	2020	National
19	Jitendra Patidar	Effect of early-post-emergence herbicides against weeds in soybean in Madhya Pradesh.	35th M. P. Young Scientist Congress. Souvenir	5	2020	National
20	Jitendra Patidar, M.L. Kewat and Shobha Sondhia	Residue concentration, persistence and dissipation of fomesafen in soybean crop and soil.	Indian Society of Weed Science Biennial Conference on *"Weed Management for Enhancing Farmers' Income and Food Security"*. Proceedings	97	2020	National
21	Kunika Silodiya and Jitendra Patidar	Mitigation and management of herbicide residue in soil – A review	Indian Society of Weed Science Biennial Conference on *"Weed Management for Enhancing Farmers' Income and Food Security"*. Proceedings	265	2020	National
22	M.P. Sahu, M.L. Kewat, J.K. Sharma, A.K. Jha, Jitendra Patidar and L. Badole	Effect of weed control practices and crop mulch against weeds in chickpea.	Indian Society of Weed Science Biennial Conference on *"Weed Management for Enhancing Farmers' Income and Food Security"*. Proceedings	185	2020	National

23. Singh S. B. and Patel R. P. 2019. Management of chilli insect pests by using different doses ofEmamectin Benzoate3.7% + Difenthiuron 46.3% WP. International conference on Global Research Initiatives for Sustainable Agriculture & Allied Sciences(GRISAAS-2019) during 20-22 October, 2019 at ICAR-National Academy Of Agricultural Research Management, Hyderabad, Telangana (India).
24. Patel R. P; Singh S. B; Kanpure, R. N. and Patidar, B. K. 2019. Effect of abiotic factors on occurrence of fruit rot disease on ambebahar guava(*Psidiumguajava* L) caused by PhytophthoranicotianaeVarParasitica (Dastur) Waterhouse. International conference on *Global Research Initiatives for Sustainable Agriculture & Allied Sciences* (GRISAAS-2019) during 20-22 October, 2019 at ICAR-National Academy Of Agricultural Research Management, Hyderabad, Telangana (India).
25. Kanpure, R. N; Patel R. P; Singh O. P; Bhandari, J; Kacholi, B; and Patidar, D. K. 2019. Influence of foliar nutrition of Urea, Borex and Zinc Sulphate on growth yield and quality of guava (*Psidiumguajava* L) CV. Rewa-72. International conference on *Global Research Initiatives for Sustainable Agriculture & Allied Sciences* (GRISAAS-2019) during 20-22 October, 2019 at ICAR-National Academy Of Agricultural Research Management, Hyderabad, Telangana (India).
26. Kushwah, L.; Sharma, R.K.; Kushwah, S.S. and Singh, O.P. (2019). Influence of organic manures, inorganic fertilizers and their combinations on growth and yield of radish (Raphanussativus L.). Abstract in National seminar on doubling income through sustainable and holistic agriculture (DISHA) held at YSP Uni. of Hort. and Forestry, Solan (HP) INDIA from 05-07 June, 2019.
27. Priyamvada Sonkar, Shailendra K. Dwivedi and Raju Dohre. 2019. Impact of post-harvest treatments on shelf life and quality of guava (*Psidiumguajava L.*) cv. Allahabad Safeda. National seminar on Biochemical and Molecular Biology Intervention for Nutritional Security and Food Safety at NAU, Navsari, Gujrat: 203.
28. Shailendra K Dwivedi. 2019. Production and assessment of anthocyanins precipitated at different pH values. National seminar on Biochemical and Molecular Biology Intervention for Nutritional Security and Food Safety at NAU, Navsari, Gujrat. 265.
29. Khan, K. A.; Katiyar S.K. and Nema P.K. 2019. Drying Kinetics, Colour Characterization and Water Activity of TinosporaCordifolia Drying. 10th Asia-Pacific Drying Conference at Vadodara, Gujarat from 14-17 December 2019.
30. Choudhary, Deepak and Singh, Om. 2019. Storage studies of blended ready-to-serve (RTS) beverages prepared by aonla pulp and aloe vera gel. National Seminar on Doubling income through sustainable and holistic agriculture, during 05-07 June, 2019 at Y.S. Parmar University of Horticulture and Forestry, Solan, H.P., India.:169.

14.3 BooK:

S.No	Author(s)	Book Name	Year	ISBN No.
1	Joshi Ekta, Vyas Abhay Kumar and Sasode Deep Singh	Nutrient omissions studies in maize-wheat cropping system of India	**2020**	978-620-0-44022-8
2	Singh Neelam and Joshi Ekta	Nutrient management in kharif groundnut	**2020**	978-3-659-52632-9
3	Dr. Reeti Singh, Dr. Ajay Kumar,Dr. Rajni Singh Sasode, Dr. Pragati Saini, Dr. R.K. Pandya, Mr. Ashish Bobade, Dr. Jagdish Kumar Patidar and Dr. Radha Gupta	Handbook of Fungi pp-170 (Second proof reading stage)	2020	NEW INDIA PUBLISHING AGENCY New Delhi-110 034
4	M.K. Kureel, D.S. Mandloi, Dr. K.V. Singh and Dr. R. Lekhi	Post Harvest Management and Value Addition of Fruits and Vegetables	2020	978-81-7622-399-7
5	**Phundan Singh, MridulaBillore and Sushma Tiwari**	**Molecular Biology and Plant Biotechnology**	**2020**	**978-93-89719-36-9 (PB)**
6	Ranade D.H., Mujalde Santosh, Swarup Indu,Akhilesh Singh, Bhagat, D.V. and Girothia, O.P.	Biotech books, New Delhi	2019	978-81-7622-441-3.
7	Ranade D.H., Mujalde Santosh, Swarup Indu, Akhilesh singh, Bhagat, D.V. and Girothia, O.P.	Biotech books, New Delhi	2019	978-81-7622-442-0
8	Dr R P S Dhiman, DrVirendra Kumar Shukla and Dr Ashok Kumar Sharma	Rama Publishing House, Meerut	2018	
9	Dr. Gopala and Dr. RK Singh	Diseases of field and horticultural crops and their management	2020	978-93-89996-31-9
10	Dr. S.B. singh, Dr. A.K. Badaya and Dr. S.N. Upadhayay	Toxicology of Insecticides	2019-20	978-81-7622-459-8

11. KhursheedAlam Khan, Megh R. Goyal and Abhimannyu A. Kalne. 2020. Processing of Fruits and Vegetables: From Farm to Fork. Published by AAP/CRC press, Taylor and Francis Group, USA. Hard Book ISBN: 9781771887083, E-Book ISBN: 9780429505775.
12. Dr. Nitin Soni. Processing and value addition of non-alcoholic beverages and Spices (RVSKVV Pub. No 104/2019).
13. R. P. Patel, R. N. Kanpure and A. Haldhar (2019).Mushroom Utpadan, Prasanskaranevamvipnan (Under ni pa Publication)

14.4 Popular Articles:-

1 दुबे राजीव, दुबे डी.पी., तिवारी, डी.के., सिंह, ओ.पी. एवं कचौली बसंत (2019) बरसीम उत्पादन की उन्नत सस्य तकनीकी, कृशक चेतना, वर्श 08, अंक 06, जबलपूर, जनवरी–फरवरी (2019).

2 षोभाराम अंजनावे, डॉ, प्रियंवदा सोनकर एवं डॉ. असंत कचौली (2019) कटहल की व्यावसायिक खेती मध्य भारत कृशक भारती, ग्वालियर, फरवरी, 2019 पेजः 13

3 ओम सिंह एवं अंकित पाण्डेय फर्टिगेषन (उर्बर सिंचाई): बागवानी फसलों में टपक सिंचाई के साथ उर्वरक प्रयोग RNI No.UPHIN/2013/56443 बगवानीः उत्तर प्रदेष डेवलपमेन्ट फाउण्डेषन 4/15 डालीबाग, लखनऊ, उत्तर प्रदेष 46–50

4 राजीव दुबे, डी.पी. दुबे, बसंत कचौली, आर.पी. पटेल (2019) बरसीम की खेती। कृषक चेतना जनवरी–फरवरीए पेज 52

5 ओम सिंह, ऋचा सिंह, प्रतिक्षा सिंह (2019). औशधीय पौधे – औशधीय उपयोग, पोस्ट–हार्वेस्ट प्रबंधन और मुल्य संवर्धन, 20 मई 2019

6 विनय कुमार गौतम, डॉ. के.के. यादव एवं डॉ. राजीव दुबे (2020) मृदा स्वास्थ कार्ड बनाने में सुदूर संवेदन एवं भौगोलिक सूचना तंत्र की भूमिका। राजस्थान खेती प्रताप, जनवरी 2020, पेज नंबर 17–18.

7 डॉ. राजीव दुबे, डॉ. ओ.पी. सिंह, विनय कुमार गौतम एवं डॉ. के.के. यादव (2019). लहसुन उत्पादन की उन्नत सस्य तकनीकी, कृशक चेतना, सितंबर–अक्टूबर 2019, पेज नंबर 55.

8 डॉ. राजीव दुबे, डॉ. आर. एस. चुडावत, एवं डॉ. दीप सिंह सासोडे (2020). मसूर की फसल में रोग एवं कीट नियंत्रण. कृशक चेतना, जनवरी–फरवरी 2020, पेज नंबर 23

9 डॉ. जी.एस. चुण्डावत , डॉ एस. पी. त्रिपाठी , डॉ एस.बी.सिंह एवं डॉ आर.पी.पटेल (2019). प्रमुख जैव कीट–व्याधिनाशक एवं उसकी प्रयोगविधि कृशक वंदना जुलाई 2019 पेज नं. 12।

10 डॉ. जी.एस. चुण्डावत एवं डॉ एस.बी.सिंह (2019). दीमक एवं उसका नियंत्रण, मध्य भारत कृशक भारती , जुलाई 2019 पेज नं. 32

11 डॉ. जी.एस. चुण्डावत , डॉ एस. पी. त्रिपाठी , डॉ एस.बी.सिंह एवं डॉ आर.पी. पटेल (2019). प्रमुख जैव कीट–व्याधिनाशक एवं उसकी प्रयोगविधि कृशक वंदना जुलाई 2019 पेज नं. 12।

12 ओम सिंह, ऋचा सिंह, प्रतिक्षा सिंह (2019). औशधीय पौधे – औशधीय उपयोग, पोस्ट–हार्वेस्ट प्रबंधन और मुल्य संवर्धन

14.6 Book Chapter:

S.No	Author (s)	Title	Book Name	Page No.	Year	ISBN No.
1	Jaya Rathore, pramodkumar and R.S.Sikarwar	Natural Resource management in term of crop germplasms in India	Natural Resource management and sustainable food production	102-107	2020	978-81-888-05-327
2	Radha Gupta, Sushma Tiwari, M.K. Tripathi and Sajjan Kumar Pooniya (2020).	Bioinformatics and Its Applications in Crop Improvement	Recent Trends in Molecular Biology and Biotechnology. *Integrated Publications*	129-151	2020	ISBN: 978-81-945148-7-9; E-Book ISBN: 978-81-945148-8-6
3.	Vinod Kumar Sahu, Yogendra Singh, Sushma Tiwari and Akanksha Tiwari	Potential of Bioethanol as Future Fuel.	Advances in Biological Sciences and Biotechnology (Volume - 1) *Integrated Publications*	-	2020	Book in press ABSB-01-10 accepted on09-04-2020
4.	Pardeep Kumar R. K. Singh	Biological Control of postharvest diseases in vegetables	The Vegetable Pathosystem: Ecology, Diseaese Mechanism and management Apple Academic Press CRC Press Taylor and francis group	-	2019	978-177188-776-2.
5.	Gopala, RK Singh, Kishore P Panzade	Recent insight into detection and management of phytoplasma dieases	Innovative approaches in diagnosis and management of crop diseases	-	-	-
6.	Sachin Kumar Jain, Kamal Khiladi, Mukesh Dongre	Detection and Management Approaches of Bakanae (Foot Rot) Disease in Rice.	Innovative approaches in diagnosis and management of crop diseases	-	-	-
7.	Kumawat N., Kumar R., Khandkar U.R., Yadav R.K., Dotaniya M.L.,	Silicon (Si) and Zinc (Zn) Solubilizing Microbes: Role in	Biofertilizers for Sustainable Agriculture and	-	2019	https://doi.org/10.1007/978-3-030-18933-4_6

	Mishra J.S. and Hans H.	Sustainable Agriculture. Biofertilizers for sustainable Agriculture and Environment.	Environment, Soil Biology 55, pp.109-135.			
8.	Kumar R., Kumawat N., Saurabh K., Hans H., Mishra J.S., Khandkar U.R., Meena R.S. and Bohra J.S.	Conservation Agriculture: Perspectives on Soil and Environmental Management in Indo-Gangetic Plains of South Asia.	Sustainable Management of Soil and Environment Sustainable Management of Soil and Environment. pp 123-168.	-	2019	https://doi.org/10.1007/978-981-13-8832-3
9.	Kumar R., Kumawat N., Saurabh K. and Mishra J.S.	Diversification of Agriculture for mitigating food and nutritional security.	Crop Diversification for Resilience in Agriculture and Doubling Farmers Income. ICAR –Indian Agricultural Research Institute (IARI) Pusa, New Delhi, pp. 210	-	2019	-
10.	Saurabh S., Kumar R., Mishra J.S., Hans H., Kumawat N., Meena R.S., Rao K.K., Kumar M., Dubey A.K. and Dotaniya, M.L.	Carbon and Nitrogen Mineralization Dynamics: A Perspective in Rice-Wheat Cropping System	Carbon and Nitrogen Cycling in Soil, pp, 463-498.	-	2020	https://doi.org/10.1007/978-981-13-7264-3_14
11.	Kumar R., Saurabh K., Mishra J.S., Kumawat N., Hans H. and Bal Krishna		Sustaining Productivity through Integrated Use of Microbes in Agriculture.	-	2019	(Accepted in Springer)

12. PushpendraKoli, B. H. Choudhury, Om Singh (2019) Name of Compendium: Significance of Bioactive Ingredients and Supplements in Health Foods. Feed Additives for Livestock. In compendium total no. of page-139 Chapter-page from 62-71.

13. Sharma, S.; Khan, K.A.; Sehrawat, R. Single cell proteins: Role in food security in Food Security: Impact of Climate Change and Technology, Ed. Sahrawat, R., Xiao, H.-W., Jangam, S.V., Mujumdar, A.S. 2019, pp. 73-88. Available online: https://arunmujumdar.com/ebooks/ **Food Security: Impact of Climate Change and Technology** – Edited by R. Sehrawat, H.-W. Xiao, S.V. Jangam and A.S. Mujumdar
14. Misra, A. K., Yadav S.B., Mishra S. K. and Tripathi M. K. Impact of Meteorological Variables and Climate Change on Plant Diseases In K. Pradeep, Tiwari, A.K., Kamle, M., Abbas, Z. and Singh, P. (Eds) "Plant Pathogens-Detection and Management for Sustainable Agriculture"(PP.313-327) Publisher: Apple Academic Press Inc. 1265 Goldenrod Circle NE, Palm Bay, Florida 32905, USA (ISBN: 978-0-42905-721-2).