The world is passing through a very crucial phase where the geopolitics based on guns and grains are competing with each other. Escalated food prices and famine rates associated with climate change have acted as stressor that contributed to unrest in different parts of the world. The guns are vying among different groups to take control of socio-economic and geopolitical situations. On one side the different human organizations under the stewardship of United Nations are trying to affix tranquillity by satiating the diabolical internal restless enemy in terms of hunger; the guns are being used to silent and annihilate the subjective external enemies. The two schools of thought are clearly vying for their mode of survival; grains or guns? Every diabolical psychological social unrest under the globe had lineage to hunger at one or the other point of time. The peace in the world can be contemplated only by targeting grains production rather than guns. The irony is that currently the young generation detest agriculture as a profession. The trend is vehemently alarming. The displacement of farmers both in number and age is neither appropriate nor inexorable. The dicey situation is still made complicit by factors like the farmland has become too expensive to be afforded by ordinary farmer. The risks and uncertainties in agriculture are the other deterrents to be tolerated by the farmers. The bottom line is that situation is complex, retain the youth in agriculture or they will find some other ways to release their frustrations. And of course, there is
no other way out but to counter the trend; since we are not going to stop eating. The biggest predicament of agriculture as on the day is can the agriculture be catapulted as social enterprise? The concerted endeavour should focus on putting more young farmers on smaller farms so that they can contribute in producing qualitatively nourishing food. The proper balancing needs to be done between the requirements of land for biofuel that otherwise could have been used for enhancing grains repertoires. The global consensus for rejuvenating and resuscitating debilitating natural base is well documented but requires concerted efforts to manage that from different angles. The global food production is good enough to meet the global food requirements but for equitable distribution among the haves and have-nots. The stench of the festering problem can be had from the fact that a whopping thirty odd per cent of food produced goes to waste. We all preach waste reduction but still add volume to the humongous problem in one way or the other. The salacious mangoes of Gujarat are known for their quality. We have acquired even the geographical indications for Kesar mango of Gujarat. However, virtually only a few remain eatable; the rest go bad. These mangoes travel to different nook and corners of the world and predominant of them are chucked out during handling. This need to be appreciated that when the food is wasted, all the resources that are utilized in to growing, packaging and transporting it are wasted too. And the worst part is that this wasted food goes to dump and landfills, where it decomposes in the open to produce methane, which is 20 times more powerful greenhouse gas than carbon dioxide. Mango is cited as a symbolic example because we all love it. The narration is the same in others too. Food is wasted in supply chain, retailers cull out imperfect quality, hotels have lots of left over meals and event caterers are left with untouched connoisseur cuisines. We had myriad projects entailing food processing from farm to fork. However, understanding waste is the first step towards reducing it. Can we discourage wastage of food? And of course, there is need to develop a structured participatory system where the excess or left over food can become accessible to the ones who are not so privileged. We can create better farming policies that attract investments and lot many new young farmers/ranchers eager to practice it volitionally rather than compulsion. And of course, irrespective of whether the monsoon is normal or 88 per cent deficient, the farmers should be ensured against calamities and market prices. Once the society at large and youth in particular get attracted to grains production in farms, when the internal enemy of humankind called hunger that is the sole cause of crimes gets addressed adequately; the guns will automatically go silent for the sake of peace and tranquillity under the sky. Amen!

Yoga Fever Catches SDAU on International Yoga Day

Twenty-First June is the summer solstice and known as the longest day in the Northern Hemisphere. However, from this year onwards it has been named as “International Yoga Day” by the United Nations at the behest of the Hon. Prime Minister of India. Drenched in the mood, SDAU celebrated the first International Yoga Day on 21st June 2015. Over 2500 members of SDAU including officers, teachers, students, non-teachers and administrative staff participated in the event with aplomb. The enthusiastic staff from the Mamlatdar Office, Taluka Panchayat, Navodaya Vidyalaya and Local Police

(Ashok A. Patel)
Agriculture is both the cause and victim of water scarcity. Over 83 per cent of the available water is consumed in agriculture sector. The nexus between water-energy-agriculture-ecology-livelihood securities needs no underscoring. Gujarat has undertaken some path breaking sui-generis endeavours on wind and solar energy generation through unconventional means. The state is blessed with plenty of sunshine with pragmatically little cloud interventions. SDAU initiated an experiment on generation of solar energy at the agricultural farms for pumping out ground water. For this, the infrastructural facilities subsuming 1 HP solar photovoltaic water pumping system was inaugurated by the Hon. Vice-Chancellor Prof. (Dr.) Ashok A. Patel on 19 June, 2015 in the College of Renewable Energy and Environmental Engineering. The photo voltaic panel converts bright sunshine directly into DC Power that would be used to operate DC pump, thereby obliterating need of inverter to other wise convert DC power into AC power. The system discharge has been worked out to be 10,000 lph. The system runs on 1250 Wp solar PV
array, 1 HP AC induction pump and brushless D.C., both submersible and electronic controller. The dedicated change over system allows only one pump to run at a time enabling independent evaluation of the pump.

There is a misconception that the solar powered water pumps might spur the farmers to extract more water from the already exhausted aquifer due to free solar energy. There is a solution to this as well by allowing the farmers to sell extra/saved harvested energy to power grid. Having created an imminent win-win situation for farmers, the next hunch is that employing of solar panel structures in agricultural land might cause some shade and thereby could jeopardize the crop productivity due to curtailed photosynthesis. As a result SDAU has started another experiment on both dry and irrigated conditions as to what would be the ideal conditions for arranging solar panels in agricultural land to harvest maximum sunshine to generate energy without any ill impact of shade on the productivity of crops grown under solar panels.

State Home Minister Extols Research on Cattle Improvement

Hon. Home Minister (State), Government of Gujarat, Shri Rajni Patel visited the Livestock Research Station (LRS) on 19th June 2015. He was conducted to different structural components of research entailing Kankrej Cattle, Mehasani Buffalo, Sheep and Goat and Semen Processing Laboratory. The visit was conducted by Dr J B Patel, Research Scientist (Livestocks) in presence of Hon. Vice Chancellor, Prof. (Dr.) Ashok A Patel, Dr. R. R. Shah, Director of Research; Dr H. N. Kher, Registrar and Dr. K. A. Thakkar, Director of Extension Education. The Hon. Home Minister (State) evinced keen interest in different activities of LRS. The North Gujarat agriculture being animal husbandry based, he extoled the laudable achievement of LRS that could evinced three times increase in average milk productivity per lactation of Kankrej herd, a native breed of cattle being maintained at LRS. He motivated the scientists of LRS to apace the farmers’ centric research so that such results are visible in other breeds of animals too. He lauded the available facilities in the high tech Semen Processing Laboratory for Kankrej breed of cattle. LRS maintains the
Vice Chancellor Calls Young Scientists as Energy Group

Research and development in agriculture and allied sciences is the current phase science in which enhancements in three “ities” viz; productivity, quality and profitability is targeted keeping in mind the psycho-socio-eco-sustainability of both farmers and natural base. The dearth of technical staff is a pervasive problem. Therefore, exploring the real problems bogging down the three “ities” precisely, expediently and energetically cannot be over emphasized. The university earmarked fifty-seven young, energetic and enthusiastic scientists from different colleges/research stations and organized a meet under chairmanship of Hon. Vice-Chancellor on June 11, 2015 at Sardar Smruti Kendra. The Hon. Vice-Chancellor Prof (Dr) Ashok A. Patel rightly named this group as “Energy Group” and exhorted them to think deep in the topic of research of their interest, interact with each other and diversify the research topic on multi-disciplinary mode. He advised each member of the group to come out with some innovative topics of research pointedly focused on local problems. He assured them the best of facilities and removal of any hurdle that come their way to catapult their vision into action. He signed off with the hope that whatever this groups would achieve will do personal proud to him.

Proven pedigree bulls of Kankrej breed in sets of eight bulls from which it produces around 3000 doses of semen per month. Part of these doses i.e around 10,000 per bull are conserved as national genetic resource at Meerut, Uttar Pradesh; while other part is used in improving around 4000 cows through ten Artificial Insemination Centres spread over five talukas of Gujarat viz; Tharad, Dhanera, Deodar, Deesa and Lakhani. LRS has wholesome long term semen storing facilities in which it has stored more than one lakh doses of semen of proven bulls with all the technical details prescribed on the dose.

Vice Chancellor Exhorts the Officials to Save and Capture Energy

The Hon. Vice Chancellor, Prof (Dr) Ashok A. Patel, along with Officers of the SDAU graced the World Environment Day celebration in the College of Renewable Energy and Environmental Engineering, Sardarkrushinagar. Fifth June is celebrated as Environment Day to raise global awareness for spurring rational and level-headed utilization of natural resources to protect nature and the Planet Earth. Speaking on the occasion, the Hon. Vice Chancellor raised the issue of energy crisis being faced at the global level. He exhorted the students and faculty that even a small effort of saving energy like switching off a tube light could have a humungous cumulative effect for saving energy at global level. The adoption of improved technology synced with such small cumulative efforts to save energy could be a game changer in sustaining natural resource. Consequent upon new environmental friendly technologies evolved almost every day, he advised the gathering to be conversant with the latest technologies in saving energy. Getting concerned with the large chunk of land lying barren in North Gujarat, he called upon everyone to motivate others and do as much tree plantation as possible to capture carbon and improve ecological milieu of the region. With an immaculate poser to the officials present in the function, he wandered that lot of precious energy could have been saved had the officials opted to share their official vehicle for travelling to attend the function. He motivated the students to get involved in sustaining the
resources of Mother Earth in a big way and led a big campaign on tree plantation in the College of Renewable Energy and Environmental Engineering. He also witnessed the drive test of the solar energy run scooter developed by the faculty and students of the college. The celebration was appropriately garnished by an expert lecture on “Air pollution monitoring” by Ms. Pratiksha Raval, Geo-Green Mechanism Pvt. Ltd., Ahmedabad; Inter Collegiate Elocution; and Photography and Painting Competition specifically focussed on “Environmental Resources: Right or Duty” and “Green Campus”.

Farmers Thrilled with Twin Technologies of SDAU in Cotton

Gujarat is the fountainhead of Bt cotton revolution in India. It produces more than 125 lakh bales per annum, which is five time more than pre-Bt cotton era. The Gujarat Seed Certification Agency, Gandhinagar bought the Bt technology from Monsanto and got the Bt versions of the earlier cotton Hybrids like G Cot Hybrid 4, G Cot Hybrid 6, G Cot Hybrid 8 and G Cot Hybrid 10 developed in Gujarat. SDAU released a new Bt cotton Hybrid GTHH 49 BGII using Event 15985 (trade name Bollgard II®) entailing expression of both the Cry1Ac and Cry2Ab insecticidal proteins. The Hybrid has ability to produce high seed cotton yield (3500 kg/ha), lint yield, number of bolls/plant and calculated oil yield with comparatively better fibre quality. The Hybrid is responsive to better agronomic practices under irrigated condition where it can produce more than 4850 kg/ha seed cotton yield. It possesses good morphological characteristics like 2-3 monopodial branches that enables good aeration and penetration of sunlight, 15 to 20 long fruiting branches, open plant type and short internode on main stem as well as on
Committee Monitors Problems of Castor Hybrid Seed Production

The hybrid seed production in castor is a very intricate task. The reps of Gujarat Seed Producers Association represented regarding the colossal rejection of GCH 2 seed production plots. A committee comprising Dr. A. J. Desai, Research Scientist (Castor-Mustard), Dr. M. P. Patel, Asso. Professor, C.P. College of Agriculture, Dr. D. K. Patel, Asso. Res. Scientist (Castor), Shri. B. B. Kundariya, Production Manager, Gujarat Seed Corporation, Gandhinagar and Shri J.R. Bhatol, Asstt. Seed Certification Officer, Gujarat State Seed Certification Agency, Ahmedabad, visited hybrid seed production plots of GCH 2 and foundation seed production plots of male parent JI 35 at Lunawada, Panchmahal on 1st April, 2015; the foundation seed production plots of VP 1 female line at Gadhuli village of Lakhapat taluka (Kutchch) on 10th June, 2015; and Grow Out Test conducted by Gujarat Seed Certification Agency at Dehgam farm on 21st May and 16th June, 2015. The committee reported that there is no confusion about the red tinge and red stem of the GCH 2 castor hybrid in GOT as raised by reps of Gujarat Seed Producers Association.

The other technology that is likely to revolutionize cotton cultivation is Gujarat has been named as, “High Density Planting System (HDPS)”. High temperature following withdrawal of monsoon around September causes heavy stress, called klaikhra in local parlance, in early maturing Bt cotton hybrids having high boll load. This often leads to forced maturity and consequently poor yield. The HDPS retrieves the situation to advantage by sowing cotton at a narrower spacing of 60 cm x 45 cm instead of traditional spacing of 120 cm x 45 cm. This not only gives 35 to 70 percent higher seed cotton yield with lesser quantity of precious seed but also thwart forced maturity and enhance net economic returns by 53 per cent. The cotton growers are thrilled with the twin technologies of Bt cotton Hybrid GTHH 49 BGII and HDPS and are anxiously waiting to translate the technologies in field as they have accomplished earlier.

STUDENT ACTIVITIES

Students Visit Geothermal Energy Plant

Students of fourth and sixth semester from the College of Renewable Energy and Environmental Engineering visited the real time working of geothermal energy plant at Kankaria Zoo, Ahmedabad to learn the rope on 6th May, 2014. They were apprised as to how the constant temperature beneath 3 meter of earth surface is generated by exchanging hot/cold ambient air to provide comfort to the animals of zoo all along the year. They were explained the principle, design, installation and operation of geothermal energy trapping and utilization to bring down the temperature to 5° to 7°C in the Zoo. Here it is worth mentioning that the College of Renewable Energy and Environmental Engineering has contemplated to develop such eco-friendly technology for seasonal comfort in the campus.
Environmental Engineering participated in the 10th National conference on Indian Energy Sector “Synergy with Energy”, organized by SAKET Projects Ltd. on May 5-6, 2015 at H. T. Parekh Auditorium, AMA, Ahmedabad. Shri L Chuaungo IAS, Principal Secretary, Energy & Petrochemicals Department Govt. of Gujarat, presided over the inaugural session.

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Suhel Notches 7th Rank in Gujarat SSC Board

Sipai Mohammad Suhel Amibhai passed his S.S.C Board Examination -2015 by securing 99.93 Percentile (PRA, 92.67%) and ranked 7th in Gujarat Board. His father Dr. A. H. Sipai is serving as Assistant Research Scientist in Regional Research Station, Bhachau, Kutchch. Suhel's mother Mrs. Sipai Aasiben Amibhai is a primary school teacher and wants her son to be a doctor. SDAU felicitates Suhel for his achievement.

 Gujarat due to high infestation of wilt and splitting seed quality of earlier varieties. GC 4 overcome these bottlenecks. It is the first ever wilt resistant variety with high volatile oil content, greyish bold no-splitting pungent seeds with fast aroma that fetch premium in the market. Gujarat is numero-uno in production of seed spices with 70 percent contribution to national kitty despite 58 percent acreage. The Centre's has done laudable special efforts to make the quality seed of different seed spices available to the farmers at affordable rates through Farmers' Participatory Agricultural Research Project.

In pursuance to its enviable R&D contributions, Centre for Research on Seed Spices (CRSS), Jagudan was adjudged as the best of the 60 AICRP Research Centres for the year 2013-14. The award and a trophy was given by Dr. S. K. Malhotra, Horticulture Commissioner, Govt. of India, New Delhi in the Annual Review meeting held at Dr. YSR Horticulture University, V.R. Gudem (Tadepalligudem), Andhra Pradesh on 20th June, 2015. SDAU congratulates Dr. A. U. Amin, Research Scientist (Seed Spices) and his team for the feat and wishes many more to come.

Thirty-Seven Students Romp Home in JRF/SRF

Thirty-seven students of SDAU made it in SRF/JRF examination conducted by the ICAR. SRF and JRF examination is meant for scholarship that the students earns from ICAR/ concerned university for pursuing their PhD and MSc degrees, respectively.

The selected students for JRF entailed 9 from Agriculture, 8 from Veterinary, 4 from Horticulture and 3 each from Basic Science and Dairy Science. There were 7 students from Agriculture and 2 from Veterinary who passed the SRF examination.

Forty Retire from SDAU Service

Twelve teachers and twenty-eight other employees hung their boot in May-June, 2015 after rendering incredibly meritorious service. SDAU wishes them healthy retired life.

EXTENSION ACTIVITIES

Scientific Advisory Committee meeting (SAC), Khedbrahma

Scientific Advisory Committee meeting of KVK, Khedbrahma was organized on 18th May 2015.
The technological versatility and backstopping of agriculture in feeding teeming population has incredible track record. However, confluence of concerns like inflated demand, climate change, input inefficiency, emergence of insurmountable biotic and abiotic stresses, increased cost of production and low investment in agricultural R&D etc have unpacked during the last couple of decades. Farming has always been fraught with risks and challenges. Agriculture thus has become both behemoth contributor and victim of these concerns. These issues need immediate attention in right perspective otherwise they might culminate in livelihood issues particularly for the small farmers. It is ironic that despite humungous payoff of record annual production of 264 million tons, which was not an easy task, the level of investment in agriculture research has been peanuts. Young people are getting distracted from farming and the size of the holding is getting still smaller. The bottom line is that only farmers can feed the world but it has to be rightly braced up with tools of science and ecology having societal edifice. The concern is that certain interventions might have short term consumer centric benefits but on long term basis they have irretrievably damaged the eco-balance, and agriculture and the farmers have become the victim in this narration of agricultural development. The obvious question what are our tripping stones that need to be properly placed to secure our posterity of adequate ecology, food and nutrition without damaging natural base?

The word “Intelligence” has been derived from Latin word “*inter legere*”, which literally means to choose. Having so defined the meaning of intelligence, it has been all pervasive in agriculture ever since it was initiated along the riparian swathes. The core Darwin theory of evolution of survival of the fittest is also based on this inherent nature of the plants’ intelligence to react, respond and survive to the external stimuli. Intelligence is also evident when the farmer chose among the available genera and species to respond to changing context of his needs. From the time immemorial, living things...
have been engaged, dispensed and innovated all the time to deal with environmental challenges. The cardinal feature of the living creatures is that it loves midcourse correction by reacting and responding to external stimuli rather than passively propelled with them. The traditional agriculture has been the manifestation of these “choices” forced by nature and aided by the farmer to his advantage. The behemoth aerial, terrestrial and marine biodiversity that this earth sustains on the day is the example of nature's intelligence.

The pestering demand of assuring food and nutritional securities with limited resources has always constrained us to think of lacing and syncing agriculture with science so that more and more can be produced per unit of area. The word “Science” is based on the word, “scire” means to know. The food production has been indiscriminately targeted; though the meaning of the word science implies us to know whether the food that we are growing is based on the knowledge of biodiversity, knowledge of living seed, of living soil and soil nutrition and of humongous intricate web of interaction between different species in the agro-ecosystem. The farmer would always honour and practice the complex inter alia system of interacting, self-organizing, self-sustaining, self-renewing, and self-evolving system that farmers have had practiced.

The traditional agriculture has been a cognitive system that explicitly or implicitly would recognize the inter alia communication among the different components of ecological web. Farmers have been the experts of ecological web by intuition. Scientists have fathomed deep in studying ecological evolution of web of microorganisms, plants, animals, soil, soil nutrition, etc. However, agro-chemical based industrial agriculture has totally ignored the intricate ecological web of microorganisms, plants, animals, soil and soil nutrition, etc. As on the day, soil is considered as empty container in which agro-chemicals are stuffed to produce food grains irrespective of repercussions that they might inflict on ecology. This means agro-chemical have substituted the ecological functions and services that nature and farmers can provide through volitional renewal of soil fertility, pest and weed control. The fall out of the destruction of the self-sustaining function of ecological web by the toxic chemicals to agriculture need no underscoring. This has depredated all the seminal ingredients of ecological web entailing microbes, soil, soil nutrition, plants and animals. As on the day, sustaining health of natural base has become too dicey concern to question the future of posterities. It is high time to understand that knowledge of a small fragmented part in isolation of its relationships with the rest of the system ultimately culminates into not knowing and precisely becomes anti-science. Each component of empirical equation of production i.e. living seed + soil+ nutrition + agro-chemicals + water + weather condition + microbes etc have to be properly weighed in relation to ecological salubriousness. Let us not ignore that seed is a genetic chip that stores all the events that would happen during its crop cycle and this genetic chip requires adequate epigenetic milieu for its potential expression. Let this be not done at the cost of the ecological health.

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OBITUARY

Mr. Alpeshkumar Dhirenbhai Bhagora, was a brilliant student of B. V. Sc. & A. H., College of Veterinary Science & Animal Husbandry, Sardarkrushinagar with great sense of discipline and commitments. Given his agility, no one ever imagined his end is so near but for the cerebral stroke that he suffered on 30th March, 2015. He was in coma ever since and breathed his last on 12th June 2015. He was born on 8th January 1992 in village Panchal of Meghraj Taluka, Dist Arravali. The irrevocable that the loss is, SDAU condoles his untimely demises and pray that Almighty to give strength to his surviving mother, a brother and two sisters to endure what no one could ever defy.
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Vice-chancellor

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Asstt. Research Scientist

Sh. Dhaval J. Joshi
Agriculture Officer

Forthcoming Events

- 54th All India Wheat and Barely Research Workers Workshop at Sardarkrushinagar during 21st-24th August, 2015
- Task Force Meeting for Validation of DUS Test Guidelines for Bael (Aegle marmelos Correa) on 13th July, 2015

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