



RNB AGRICULTURE NEWSLETTER

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At the time of publishing the first issue of 'RNB Agri Newsletter', we salute our Founder of the university Late Seth Jagannath Ji Bajaj. RNB Global University is conceptualised with his philanthropic vision into education. This newsletter is one of the steps in the direction to achieve the objectives of his vision of the university



Hon'ble
Chairperson Dr.
Ram Bajaj

We express our gratitude to our Hon'ble Chairperson Dr. Ram Bajaj Sir for his kind support, guidance and encouragement for various activities of School of Agriculture. His impetus is always on the process of learning rather than curriculum



Sh. K. K. Bajaj
Hon'ble Vice
Chairperson

We also express our thanks to Hon'ble Sh. K. K. Bajaj Sir and Hon'ble President Dr. G. S. Karkara for their valuable guidance and cooperation for progress of School of Agriculture.



Dr. G. S. Karkara
Hon'ble
President,
RNBGU

Message



Dr. Yuvraj
Bhatnagar
(Pro- Vice
Chancellor)

I am immensely pleased and delighted that the School of Agriculture of our esteemed University is poised to bring its first Newsletter Publication into circulation soon. I feel it is yet another feather in the cap of our great university. Many many congratulations to the entire team of School of Agriculture with special accolades and heartfelt appreciation to the Dean of the School for their efforts. I wish and pray for all success in all years to come.

With best compliments and regards.

Message



Dr. Shashi
Singhal, Dean –
School of
Commerce &
Management

Agriculture is one field which has been considered as the back-bone of the Indian economy. It has been a source of employment and livelihood to many. We have learnt ways and means to harvest resources for our food, clothing and shelter. Therefore, besides knowing about the basics of agriculture, we should be aware of the modern agriculture practices, the newer technologies and researches in the field of agriculture for better yield and sustainable development. It gives me immense pleasure to extend my heartfelt appreciation to Prof (Dr) S. S. Shekhawat and his entire team for taking this valuable initiative of publishing a quarterly newsletter which will provide an opportunity to the budding researchers, students, scholars and scientists to share their ideas about latest topics in field of agriculture, horticulture, food science, biotechnology and life science. This would help in disseminating new information, novel technologies and original articles from various disciplines of science including agriculture, horticulture, food technology and allied sciences.



Dr. S. S. Shekhawat, Dean, School of Agriculture

Message

I am happy to write that publication of 'RNB Agri Newsletter' has been now a reality after publication of its first issue. I am thankful to all authorities of university to write their messages for this newsletter. I also express my thanks to all faculty members and students of agriculture for their active involvement in different events of School of Agriculture, which have been reported in this newsletter. They have also got a publication in which they can get their articles published.

With good wishes to all,

University News & Events

We are happy to share that research done by our Hon'ble Chairman Dr. Ram Bajaj Sir on Regeneration of Dead Bougainvillea Tree with Organic Manure was published in International Journal for Research in Applied Science & Engineering Technology (IJRASET). Congratulations to him for doing the appreciable work. It is a matter of proud for us that our Chairman has good interest for agriculture field.



With immense pleasure we announce that our Hon'ble Vice Chairman Shri K.K. Bajaj Sir has been appointed Member of Education Committee in Ph.D. Chamber of Commerce and Industry, New Delhi. Congratulations to him.

Prof. (Dr.) S. S. Shekhawat joined on the post of Dean, School of Agriculture at RNB Global University. Dr. Shekhawat is a retired Professor and University Head from S. K. Rajasthan Agricultural University, Bikaner. He worked there as Professor (Genetics and Plant Breeding for more than 10 years.



International Conference Related to Agriculture Organised

The first International Conference on "Advances and Current Issues in Agriculture and Allied Sectors" was organised by School of Agriculture on March 10, 2022. 20 papers were presented in the conference. The participants were from Himachal Pradesh, Haryana, Telangana, Jammu and Kashmir and other places. Abstracts/ papers received for the Conference were published.



Compost Unit Started

On 14th February, 2022, School of Agriculture, RNBGU had successfully started the event of compost preparation at university campus. The event was organized with aim to develop an integrated and environmentally sound waste management system, which the target groups and the final beneficiaries of the project will benefit of its results and specific objectives.



Guest Lectures on Farm Machinery and Pearl Millet

Two Guest Lectures in Agriculture Faculty were organized by the School of Agriculture (SOA) at Seminar Hall, Administration Block on January 13, 2022. Prof. (Dr.) Er. J. K. Gaur, Assoc. Prof.

and Head, Agricultural Engineering, SKRAU, Bikaner gave keynote talk on 'Efficient and economic use of farm machinery and power' to the faculty members and the audience. Prof. (Dr.) P. C. Gupta, Professor and Pearl Millet Breeder, SKRAU, Bikaner delivered talk on 'Pearl millet: Its cultivation, improvement, and importance in Indian economy' to the faculty members and the audience.



Herbal Garden Established

On 21st February, 2022, School of Agriculture, RNBGU had successfully completed the event of herbal garden establishment under the National Service Scheme at university campus. The event was organized with aim to create awareness about combating climate change and global warming, which are the world-wide problems. All the students and teachers participated in this program. The first plantation was done by Registrar Madam, Dr. Dipali Gupta. The plants planted were *Aloe vera*, *meetha neem*, lemon grass, *tulsi*, *ashwagandha*, *satavari* and *beel*. One by one students and teachers started planting saplings. Dr. S. S. Shekhawat, Dean of School of Agriculture, was also the part of this event and encouraged the students. He later added the uses of the herbal plants to the students.



Crop Cafeteria Established

Crop Cafeteria has been established with drip irrigation facility. Seasonal vegetables are grown there. Some demonstration plots of crops are grown for learning of students.



Mushroom, It's Benefits and Scope in India

S. K. Yadav, RNB Global university Bikaner -334601 Rajasthan, India

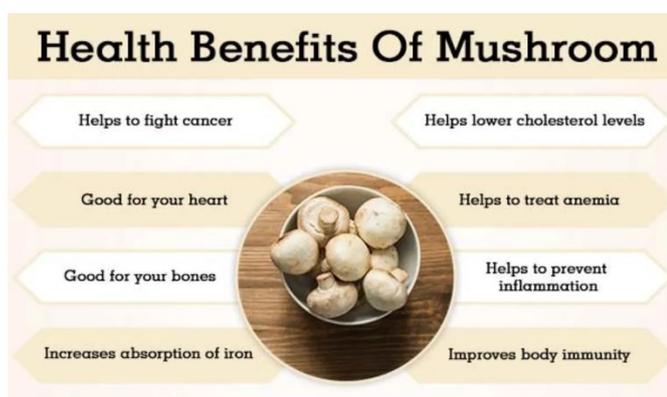
Introduction

Mushrooms are widely known for their great taste and amazing health benefits. Packed with a ton of essential vitamins and minerals, they make for an excellent addition to once diet. They are rich source of vitamin and even contain vitamin D which is rarely found in any edible substance.

The anti-inflammatory effect of mushrooms has been shown to greatly improve the efficiency of the immune system. Research has found that mushrooms help stimulate microphages in the immune system, enhancing its ability to defeat foreign bodies and making you less susceptible to serious illnesses. Some mushrooms also contain anti cancerous property and lower the risk of cancer up to 70-80%

Types of mushrooms found in India:

1. White button mushroom.
2. Straw mushroom.
3. Oyster mushroom.
4. Milky mushroom.
5. Cremini mushroom
6. Shiitake mushroom.
7. Portobello mushroom.



Scope of Mushroom production in India:

As in production of mushroom we mostly utilize residue of agriculture product so it is quite budget friendly. Apart from being budget friendly mushroom cultivation is eco-friendly, but due to less awareness about the health benefits of mushroom and its cultivation technique many people don't grow mushroom. Mushroom production provide employment to youth also and provide them a great opportunity to earn. Mushroom is good source of protein and nutrition especially for those who are vegetarian. There are several varieties of edible mushroom that one can grow but most edible one in India is button mushroom and oyster mushroom which is also known as Dhingri mushroom in India.



Genotyping-by-Sequencing (GBS) in Plants for Accelerating Plant Breeding Programmes

Ravi Kishan Soni,
RNB Global University, Bikaner

Introduction

The analysis of genomic variation is an important part of plant genetics and crop improvement programmes. DNA polymorphisms can be linked to phenotype differences, have a genetic link to the cause, or reflect linkages between individuals in populations. The development of quick genome-wide Single Nucleotide Polymorphism (SNP) detection applications in many plant species has been aided by the introduction of next-generation DNA sequencing (NGS) technologies. Genotyping-by-sequencing is an approach in which sequences are employed simultaneously to detect and assess SNPs, bypassing the entire marker assay development cycle (GBS). GBS was first invented by Rob Elshire and his colleagues as a simple highly multiplexed system for constructing reduced representation libraries for the Illumina NGS platform.

Main Features of GBS

- The GBS method incorporates a multiplex sequencing strategy for constructing reduced representative libraries for the Illumina NGS platform that uses an inexpensive barcoding system for increased efficiency at a lower cost compared to other genotyping methods. With GBS, costs can be further reduced coupled with imputation of missing internal SNPs in haplotype blocks.
- GBS requires no prior plant genome sequencing and allows for direct genotyping of plants with complicated genomes without the need for SNP discovery, making it more accessible to non-model species.
- GBS considerably decreases complexity by cleaving the DNA with enzyme(s) and DNA-barcoded adapters) with tiny amounts of starting DNA (100-200 ng).
- GBS can also give high SNP coverage in gene-rich sections of the genome at a low cost by using the proper restriction enzyme(s) (e.g. methylationsensitive

restriction enzymes). Consequently, GBS is simple, specific, highly reproducible, and rapid due to the simultaneous detection of SNPs and genotyping.

- Thus, the key components of this system have a lower cost, reduced sample handling, fewer PCR and purification steps, no size fractionation, no reference sequence limits, and efficient barcoding, and the system is easy to scale up.

General Protocol of GBS

- Tissue is obtained from any plant species
- Ground leaf tissues for DNA isolation, quantification and normalisation. It is critical to avoid cross-contamination among samples at this stage
- Restriction enzymes are used to break down DNA
- Adaptor ligations (ADP) in random PstI-MseI restricted DNA fragments with a bar coding (BC) region in adapter 1
- Representation of different amplified DNA fragments with different bar codes from different biological samples/lines. These fragments represent the GBS library
- Analysis of sequences from library on a NGS sequencer
- Bioinformatic analysis of NGS sequencing data

Application of GBS in Plant Breeding

- Marker discovery and development of high density linkage map
- Genetic mapping
- Association Mapping and Genome Wide Association Studies (GWAS)
- Genomic Selection through GBS
- Improvement of reference genome
- Polyploidy Study through GBS
- GBS for Genetic Diversity and Phylogeny Study
- Digging into the wild species

Soil Salinity – With Relation to Food Security in India

Balvinder Singh, RNB Global University, Bikaner

India would require around 311 million tons of food grains (cereals and pulses) during 2030 to feed around 1.43 billion people, and the requirement expectedly would further increase to 350 million tons by 2050 when India's population would be around 1.8 billion. To achieve food security in the country, the attempts need to focus on both area expansion under agriculture as well as rise in crop productivity. Massive urbanization is putting pressure on agricultural lands, resulting in shrinking of land holdings. Nearly 147 million ha of land is subjected to soil degradation, including 94 million ha from water erosion, 23 million ha from salinity/alkalinity/acidification, 14 million ha from water-logging/flooding, 9 million ha from wind erosion and 7 million ha from a combination of factors due to different forces. Government of India has fixed a target of restoring 26 million ha of degraded lands, including salt-affected soils, by the year 2030 to ensure food security for the people. Around 6.74 million ha area in the country is salt-affected. Estimates suggest that every year nearly 10% additional area is getting salinized, and by 2050, around 50% of the arable land would be salt-affected. Saline soils occupy 44% area covering 12 states and one Union Territory, while sodic soils occupy 47% area in 11 states. The ICAR-Central Soil Salinity Research Institute and many State Agricultural Universities are engaged in studying salt-affected soils and developing reclamation technologies and strategies. Gypsum-based sodic soil reclamation, sub-surface drainage of water-logged saline lands, salt tolerant crop varieties and improved agroforestry techniques are some of the well-adapted technologies in the country. Other technologies of management of salt-affected soils, viz. alternate land-use systems, saline aquaculture, cultivation of salt tolerant crop varieties, agro-forestry, phytoremediation, bioremediation etc. have positively impacted food and nutritional security, women empowerment, involvement of landless laborers and minimizing rural migration etc. The Government needs to make policies favorable for implementation of reclamation technologies in the country.

India supports nearly 18% of the world's human population and 15% of the world's livestock population on merely 2.4% of the world's geographical area. Since independence, India has made significant achievement in agriculture sector. Food grain production increased by about 5.5 times, from merely 50 million tons in 1950 to 275 million tons in 2017, making India not only self-sufficient but net exporter of food grains. According to [Tiwari \(2020\)](#), with a record production of rice and wheat at 116.48 and 103.60 million tons, respectively, the country registered record food grain production of 285.17 million tons in 2018–19. While the increase in food grain production during 1949–65 was mostly due to area expansion under cultivation, after mid-sixties, the adoption of a package of high yielding inputs, including use of high yielding varieties, assured irrigation, use of plant protection measures and credit support was responsible for increased production. It ushered green revolution in India.

The changing lifestyle and food habits of the people, due to the sustained economic growth, literacy and awareness, are other challenges associated with food security in India. People in general are shifting from staple food grains toward high-value horticultural and animal products. Although it may lower per capita food grain requirement, yet overall demand for food grains would increase for increasing population and increasing food needs of livestock and poultry. The grain requirement for rearing cattle and poultry etc. is comparatively high because of low and variable efficiency with which various animals convert grains into protein. At the current growth rate in agricultural production, food security in India appears to be a big challenge.

Forage Plants of Western Rajasthan

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Arid region of Rajasthan state covers the area of the state towards western side of Aravali range of hills, which divides the state almost in two parts viz., eastern and western. The arid region of the state is important for animal husbandry and forage management. The reason is that at many places in this region, annual rainfall is below 250 mm. Farmers can take only one crop in rainy season because irrigation water is not available in most of the area for the remaining part of the area. Due to importance of animal husbandry, importance of forage resources is important in the region. In this paper, information of forage plant resources of arid region has been given, which include field crops, perennial range grasses and legumes, fodder trees and shrubs, some other annual plants etc.

Important *kharif* crops for green fodder are pearl millet (*Pennisetum glaucum*), sorghum (*Sorghum bicolor*), maize (*Zea mays*), cowpea (*Vigna unguiculata*), cluster bean (*Cyamopsis tetragonoloba*). Important *rabi* crops for green fodder are oats (*Avena sativa*), barley (*Hordeum vulgare*), lucerne (*Medicago sativa*) and berseem (*Trifolium alexandrinum*).

Pasture development is important on a land area, where crops cannot be taken. Pasture can be developed by growing perennial grasses. Silviculture and horti-pastoral systems are also important in which these grasses are also used. Perennial range grasses are important in western part of the state. They supply fodder at cheap cost and help in soil conservation. Perennial grass species like *Cenchrus ciliaris*, *Cenchrus setigerus*, *Lasiurus indicus*, *Dichanthium annulatum*, *Panicum antidotale* and *Sehima nervosum* are grouped as 'High Perennial' species as they give high forage yield under natural rainfed conditions. *D. annulatum* is adapted to heavy soils with annual rainfall above 380 mm. *P. antidotale* is suited to well-textured soils with annual rainfall of 250 mm and above. *S. nervosum* grows well on hilly terrain.

Sewan (*Lasiurus indicus*) grass is important in Bikaner and Jaisalmer districts of Rajasthan. *Dhaman* (*Cenchrus ciliaris*) and *Moda Dhaman* (*Cenchrus setigerus*) are important in other arid districts of the state. These two grasses require comparatively more fertile soil in comparison to *sewan* grass. Soil fertility of pastures can be improved by cultivation of legumes. Legume crops also improve nutritive value of the fodder. *Clitoria ternatea* is one such perennial range legume for the western Rajasthan. Other important legumes for pasture development are *Dolichos lablab*, *Stylosanthes hamata*, *Stylosanthes hamilis*, *Stylosanthes guyanensis* etc.

Fodder trees can be grown in agroforestry system with livestock. It is always useful to have some fodder trees in pasture without affecting fodder yield of the grasses. Silviculture system is a good way for fodder supply in which grasses, legumes and trees are grown together. Fodder tree and shrub species provide fodder during scarcity period. *Khejri* (*Prosopis cineraria*), *zhadberi* (*Ziziphus nummularia*), *Acacia nilotica* etc. are important fodder trees in the western Rajasthan. Leaves of many tree species are used as fodder for livestock. Goats, sheep and camels mostly eat these tree leaves. Fodder trees are important in arid and semi arid areas because they can tolerate moisture stress condition. Some common fodder trees are : *Acacia arabica* (*babul*), *Acacia senegal* (*kumat*), *Ailanthus excelsa* (*ardu*), *Albizia lebbek* (*siras*), *Azadirachta indica* (*neem*), *Dalbergia sissoo* (*sissoo*), *Hardwickia binata* (*anjan*), *Leucaena leucocephala* (*subabul*), *Prosopis cineraria* (*khejri*), *Prosopis juliflora* (*pardeshi khejri*) or *vilayati babul*. Some fruit trees also provide fodder. Some examples of such fruit trees are *ber* (*Ziziphus mauritiana*), *pilu* (*Salvadora oleoides*), *goonda* (*Cordia myxa*), *goondi* (*Cordia gharaf*), *kumat* (*Acacia senegal*), *khejri* (*Prosopis cineraria*), tamarind (*Tamarindus indica*), *bael* (*Aegle marmelos*), drumstick (*Moringa olerifera*), *ker* (*Capparis decidua*) etc.

Miracle of Thinking Capacity - Your Key to Success

Yuvraj Bhatnagar, Pro- Vice Chancellor, RNB Global University, Bikaner

If we want to increase our overall success capacity, then we need to increase our thinking capacity. Many of us do not recognize the value of good thinking. Every day we have good and constructive thoughts for twenty-four hours but we do not capture them and let them go without any good. In fact, that good thought will die soon. Therefore, grab them, capture them and jot them in any piece of paper available at that time. These sudden good thoughts will become a major source of your success soon. No sooner you start working on it, success is imminent.

No strategy or business plan can be rated as a hundred percent a success plan. However, if we can write the whole plan on a paper and moderate it with the corrections from time to time through our thinking capacity, the chances of success increase to a larger extent. This requires thinking capacity through which we can strategize ourselves. Work hard on your thinking capacity, set your goals with constructive objectives and throw yourselves into it with absolute honesty and sincerity and ensure your success.

Invitation to write for 'RNB Agri Newsletter': All students and faculty members are invited to contribute their information, article etc. for publication to the Chief Editor or Convenors on their e-mail addresses.

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