





Pakistan Society for Horticultural Science

# HORTIMAG

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Inside Stories

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## Institute of Horticultural Sciences, UAF, Ranked in W2 Category in Agriculture by NAEAC

Institute of Horticultural Sciences (IHS), Faculty of Agriculture, University of Agriculture, Faisalabad, has recently been ranked in W2 category by NAEAC, which makes it the only institute in Pakistan ranked in NAEAC highest category in Agriculture. PSHS and hortimag editorial team appreciate the efforts of all faculty members, staff and students of IHS and congratulates for this incredible achievement. Best wishes for future marvelous achievements of IHS.


## Felicitations to Prof. Dr. C.M. Ayub on His Superannuation

Prof. Dr. Chaudhary Muhammad Ayub from Institute of Horticultural Sciences, UAF, retired on September 14, 2022. PSHS and HortiMag editorial team appreciate the time and efforts that he put into teaching profession and wish him good health and luck

## Felicitations to Prof. Dr. Saeed Ahmad on His Superannuation

Prof. Dr. Saeed Ahmad from Institute of Horticultural Sciences, UAF, also retired on December 31st, 2022. He served both at Punjab Agriculture Research Department and UAF, and has significant contributions in UAF fruit orchards management. PSHS and Hortimag editorial team wish him good luck and pray that his future endeavors will be filled with abundant blessings.

## Congratulations to Dr. Safina Naz on Her Promotion as Professor at Department of Horticulture, B.Z. University, Multan

PSHS and Hortimag editorial team congratulates Dr. Safina Naz on her well-deserved promotion as Professor at Department of Horticulture, Faculty of Agricultural Sciences and Technology, B.Z. University, Multan, on July 25, 2022. We wish her all the best for her future endeavors.

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# China-Pakistan Horticulture Research and Demonstration Center (CPHRDC)

On November 02, 2022, the China-Pakistan Horticulture Research and Demonstration Center (CPHRDC), joint center between University of Agriculture, Faisalabad and

Huazhong Agricultural University (HZAU), was inaugurated to promote the cooperation between Pakistan and China in the field of Horticulture. CPHRDC is international research and demonstration facility for several research projects and trainings mainly focusing on fruits and vegetable breeding, citrus and solanaceous vegetables germplasm evaluation, greenhouse production technologies, postharvest management of citrus fruits, floriculture and landscape management to produce high quality horticultural products.

The hybrid inauguration ceremony was witnessed by Prof. Dr. Iqrar Ahmad Khan (S.I), Vice-Chancellor UAF, Prof. Dr. Zhaohu Li, President HZAU, Prof. Dr. Ping Qing, Vice-President HZAU, Prof. Dr. Qiang Xu, Vice-Dean College of Horticulture and Forestry Sciences, HZAU, Miss Rabia Nasir,

focal person for Agriculture in Pakistan Embassy in Beijing, Prof. Dr. Muhammad Jafar Jaskani, Director Institute of Horticultural Sciences, Prof. Dr. Zahir Ahmad Zahir, Director ORIC, UAF, Prof. Dr. Waseem Akram, Director External Linkages, UAF, Prof. (retired) Dr. Aman Ullah Malik and faculty members of both IHS and College of Horticulture and Forestry Sciences, HZAU.

Prof. Dr. Iqrar Ahmad Khan (S.I.), Vice-Chancellor UAF said that UAF and HZAU are working together since last several years to build strong cooperation in the field of agriculture. CPHRDC created under BRI will strengthen the collaboration in horticulture research and development, bilateral exchange program, and will establish international research platform to create business and


employment opportunities in both countries. Prof. Zhaohu Li, President of Huazhong Agricultural University, expressed his greeting for this new international project and demonstrated that China has a long history of friendship and strategic collaboration with Pakistan. College of Horticulture and Forestry Sciences, HZAU, ranked 1st in Horticulture discipline both in China and worldwide. He assured that faculty members of Horticulture College, HZAU, will contribute to develop high quality horticulture sector and to maintain sustainability of Horticulture industry of Pakistan by technology development and promotion, and technical trainings.

Miss Rabia Nasir, focal person for Agriculture in Pakistan Embassy in Beijing said that China is best example of fast mechanization and food conservation, whereas, Pakistan is rich in fertile agricultural lands, young talent and labor. The complementarities will be beneficial for both countries.

This was a successful event regarding building a foundation of institutional collaboration for scientific and industrial research projects of horticulture.

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## Department of Horticulture, MNS University of Agriculture, Multan, organized 2nd Chrysanthemum Exhibition

Department of Horticulture, MNS University of Agriculture, Multan, organized 2nd chrysanthemum exhibition on 6th December, 2022. Exhibition was inaugurated by Prof. Dr. Asif Ali, Vice Chancellor, MNS University of Agriculture, Multan, and Prof. Dr. Muhammad Ramzan, Vice Chancellor, Emerson University, Multan. Moreover, Dr. Ghulam Sarwar, Project Manager TDF, Mr. Nadeem Sheikh, Senior Vice President, Multan Chamber of Commerce and Industry and local community also visited the exhibition. Different government institutions, private organizations and flower farmers, viz. DHA Multan, Cantonment Board Multan, Emerson University Multan, Women University Multan, BZU Layyah Campus, Floriculture Research Institute Multan, Ghazi University D.G. Khan, Department of Estate Management, MNSUAM, Department of Horticulture, MNSUAM and Chrysanthemum growers participated and presented their stalls. The distinguished guests appreciated the wonderful exhibition and stalls presented by different organizations. The exhibition continued till 9th December, 2022, in which people from different walks of life visited.

## International Webinars on Fruit Breeding Organized by Department of Horticulture, MNS-University of Agriculture, Multan

Department of Horticulture, MNS-University of Agriculture, Multan organized an international webinar on October 14, 2022 entitled "Fruit breeding for food security: A dire need of time". More than 200 people joined the webinar including faculty members, students, researchers, and farmers. The guest speaker, Prof. Dr. Krishan Kumar Jindal from India, highlighted the importance of wild germplasm resources for crop improvement to combat with ever-changing environmental conditions. He further added that Pakistan and India have very diverse fruit plant resources that should be used in a wise manner for crop improvement. Prof. Dr. Asif Ali (T.I.) Vice Chancellor MNS-University of Agriculture, Multan, emphasized on the prominence of fruit breeding for food security. In Pakistan, little work has been done in the fruit breeding and attention must be paid in this direction to fulfil the food requirements of the country. Dr. Tanveer Ahmad, Chairman Department of Horticulture, MNS-University of Agriculture, Multan, thanked all the participants and ensured to continue these activities in future for creating an awareness among all the stakeholders.

Later, another international webinar entitled "New Approaches in Fruit Breeding" was organized by the Department of Horticulture, MNS-University of Agriculture, Multan, on November 16, 2022. Dr. Arif Atak (Associate Professor, Uludag University, Turkey) discussed different approaches for grapevine breeding. He also talked about the ongoing grapevine breeding programs in Turkey and showed an interest for future cooperation. He has developed four different grape cultivars which are very popular. Dr. Muhammad Usman (Associate Professor, Institute of Horticultural Sciences, UAF) shared his contributions in guava and suggested guidelines for guava crop improvement in Pakistan. Dr. Muhammad Abu Bakar Saddique (Assistant Professor, Institute of Plant Breeding & Biotechnology, MNSUAM) highlighted the need of speed breeding for fruit crop improvement. Prof. Dr. Asif Ali (T.I.) Vice Chancellor, MNS-University of Agriculture, Multan, in his concluding remarks endorsed the suggestions of speakers for fruit crop improvement. He also appreciated the efforts of the organizers and encouraged them for the continuation of webinars related to the improvement of fruit crops.

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# Annual Chrysanthemum Day Organized at Floriculture Research Area, Institute of Horticultural Sciences, University of Agriculture, Faisalabad, to Demonstrate UAF Floriculture Technologies

A one-day outreach activity on demonstration of IHS floricultural technologies was organized at annual

chrysanthemum day at Floriculture Research Area, Institute of Horticultural Sciences, UAF, on December 15, 2022. In this event, along with the Incharge Floriculture/Organizer of the event, Dr. Iftikhar Ahmad, four resource persons demonstrated various floricultural technologies to the participants. After setting up the event, chief guest of the event, Prof. Dr. Iqrar Ahmad khan (S.I.), Vice Chancellor, UAF, inaugurated the event along with Prof. Dr. Qamar Uz Zaman, Vice Chancellor, PMAS Arid Agriculture University, Rawalpindi. A large number of nurserymen, gardeners from different organizations, flower growers, stakeholders, faculty members, deans/directors and students along with local community members were present to watch the unveiling of this event. After inauguration, different technologies including renovation of floriculture greenhouses and improvement of infrastructure and machinery at floriculture research area were demonstrated to the guests and participants. IHS floricultural technologies were displayed on different stalls along with various chrysanthemum exotic varieties displayed in greenhouses. After inauguration, chief guest visited IHS technologies and was briefed about the technologies, such as UAF-Gro, Rose value added products, dehydrated petals and buds, Indigenous flower seeds, new specialty cut flowers, high tech containerized plant production and FSC&RD registered calendula varieties. Different government organizations from Faisalabad, such as NIAB, AARI and PHA, along with Combined Military Hospital (CMH) Rawalpindi, PMAS Arid Agriculture University, Rawalpindi, Rawalpindi Cantonment Board and Chaklala Cantonment Board from Rawalpindi also participated in the event with their chrysanthemum varieties and cut flower displays. Several entrepreneurs produced from UAF commercial floriculture Lab., viz. Zarkhaiz Farms, Gulbaan, Florits, Event Managers, Taqreeb walay, Botanic Enterprises and Dr. Plantu also displayed their products. Private organizations which participated in the event included Jaffar Brothers, Best Garden Nursery, and New Rahman Nursery, Faisalabad.

Along with various government and private organizations displays, IHS students actively and enthusiastically participated in the event and put a lot of efforts to display their floral decor ideas in event and got a lot of appreciation from visitors.

After inauguration, H.E. ambassador of Bulgaria and CPO Faisalabad also visited the event and appreciated a lot the technologies developed and displayed by the organizers. After these visits, the organizer of the event, Dr. Iftikhar Ahmad, started the seminar on demonstration of IHS technologies, where after recitation of Holy Quran and Naat, Dr. Iftikhar Ahmad welcomed the participants and demonstrated various floricultural technologies in detail.

Afterwards, Mr. Behzad Rafiq, Manager Horticulture, Zarkhaiz Farms, Lahore, briefly explained about cut chrysanthemum production in greenhouses followed by Mr. M. Abdul Salam Khan, Instructor Floriculture, Bagh e Jinnah, Lahore, who briefed about insect/pests and diseases and their control in chrysanthemum.

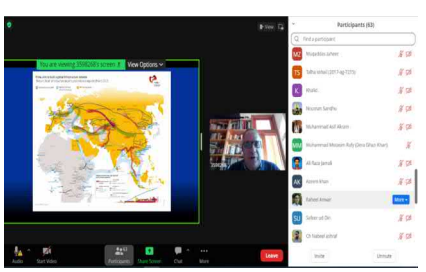
Then Mr. Irslan Ali, NARC Floriculture Program, Islamabad, demonstrated about floral arrangements, while at the end, Prof. Dr. M. Aslam Khan demonstrated about high quality nursery production and background of this research area development over last two decades. He also guided young entrepreneurs about various ideas to build their careers.

All experts/ resource persons not only demonstrated various floricultural technologies but also motivated students regarding entrepreneurship and flower business startups on small scale. The seminar on demonstration of floricultural technologies ended with vote of thanks by Dr. Iftikhar Ahmad, Convenor Management Committee, and a cup of tea for participants and lunch for the guests.

Visitors and participants were very much excited after watching mesmerizing display of flowers and participants were very confident while talking about their flower arrangements to visitors. Visitors enjoyed the event and encouraged young students about their skills and efforts. The beauty of chrysanthemums of various colors and kinds, fragrance of roses and eye-catching floral arrangements were just perfect to visit and enjoy and were praised by the visitors/participants. All the stallholders were in full zeal to show their products. At the end, souvenirs and certificates distribution ceremony was held, where Dean, Faculty of Agriculture, along with Director, Institute of Horticultural Sciences and Executive Director, Endowment Fund Secretariat distributed the souvenirs to the resource persons and guests, while certificates to the participating students and gardeners/growers/ stakeholders in the event. At the end, Prof. Dr. M. Jafar Jaskani, Director, IHS shared his views about the event and appreciated the organizers for organizing such a successful event and thanked all participants who travelled from various parts of the province. He also distributed cash prizes among labor staff members of floriculture area. It was an amazing and informative exhibition and seminar for students as well as visitors. These types of events are the source to enhance practical knowledge and learning among youth. Secondly, it aimed to demonstrate the efforts of the organizers and achievements so far in the field of floriculture in Pakistan.

## One day International Webinar on "Italian Fruit Production Industry"

One day International Webinar on "Italian Fruit Production Industry" was organized by Institute of Horticultural Sciences, University of Agriculture, Faisalabad, with the coordination of The Research Institute of Pomology, Chinese Academy of Agricultural Sciences (RIP, CAAS), China, on Dec 17, 2022. Dr. Luigi Catalano delivered the brief presentation on the Italian Fruit Production Industry.



Dr. Luigi Catalano is Italian fruit expert, and it is worth mentioning that Dr. Luigi Catalano is a part of CIVI Italy association, which represent almost all of the Italian nursery industry. Dr. Luigi Catalano described various strategies and production technologies to grow Italian fruits in Pakistan. The main purpose of webinar was to enhance the quality of fruits and vegetables. He suggested new propagation and management practices for enhancing quality of citrus, strawberry, apple, and peaches.

The enlightening webinar was marked by Prof. Dr. Zhou Zongshan, Director, Plant Protection Research Center, (RIP, CAAS), Dr. Luigi Catalano, Fruit Expert, Prof. Dr. M. Jafar Jaskani, Director, IHS, UAF (Convener), and Dr. Muhammad Azam, Associate Professor, (Focal Person) IHS, UAF.

This informative webinar was attended by over 70 participants from different universities and research institutes such as The Research Institute of Pomology, Chinese Academy of Agricultural Sciences (RIP, CAAS), China, CIVI Italy association, University of Agriculture, Faisalabad, MNSUA, Multan, PMAS-Arid Agriculture University, Rawalpindi and different research station i.e., AARI, Faisalabad, NARC, Islamabad, and Mango Research Station Shujabad, also participated to explore knowledge.

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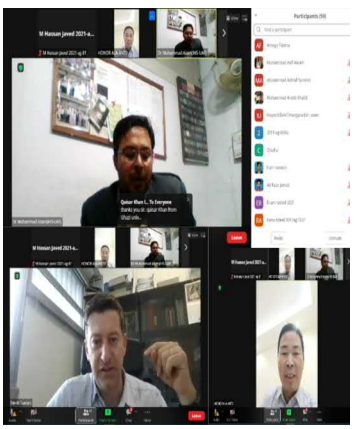
## 2nd International Webinar on "Biology, Epidemiology and Control of Post-harvest Diseases of Pome Fruits

Institute of Horticultural Sciences, University of Agriculture, Faisalabad, organized an International Webinar on "Biology, Epidemiology and Control of Postharvest Diseases of Pome Fruits" in collaboration with the Research Institute of Pomology, Chinese Academy of Agricultural Sciences (RIP, CAAS), China, on Dec 19, 2022. Prof. Dr. Davide Spadaro Department of Agricultural, Forestry and Food Sciences (DISAFA), University of Torino, was the invited speaker for this webinar. He clarified various causes of post-harvest decay and their toxicological impact on fruit quality and mentioned possible measures to control post-harvest diseases by preserving quality.



Davide Spadaro is Professor of Plant Pathology at the University of Torino (Italy) and Researcher at AGROINNOVA. He is also president of the Council of the MS in Plant Biotechnology and Vice-president of the Research Commission of the Dept. Agricultural, Forest and Food Sciences (DISAFA). His research spans from plant disease to sustainable crop protection, including biological control, from food safety (mycotoxins, human pathogens on plants) to food security (postharvest losses), from plant pathogen diagnostics to plant-pathogen interactions. He worked on several European projects.

This webinar was witnessed by Prof. Dr. Zhou Zongshan, Director, Plant Protection Research Center, (RIP, CAAS), Prof. Dr. Davide Spadaro, Department of Agricultural, Forestry and Food Sciences (DISAFA), University of Torino, Italy, Prof. Dr. M. Jafar Jaskani, Director, IHS, UAF (Convener), and Dr. Muhammad Azam, Associate Professor IHS, UAF, as focal person.

In this webinar, more than 80 participants took part from all over Pakistan. There were many national and international participants form Chinese Academy of Agriculture Sciences, China, University of Agriculture, Faisalabad, MNSUA University, Multan, The Agriculture University Peshawar, PMAS Arid Agriculture University, Rawalpindi, College of Agriculture, University of Sargodha, Karakarum International University Gilgit-Baltistan and different research stations, viz. AARI, Faisalabad, NARC, Islamabad and Mango Research Station, Shujabad.

This webinar illustrated numerous aspects and causes of postharvest decay in pome fruits, which influence the fruit quality. He explained mechanism of pathogenic microorganism and fungi which are leading causes of fruit losses and post-harvest diseases in fruits. This session briefly guided our researchers, students and stakeholders about the occurrence and control measures of postharvest diseases. It was a successful virtual event to understand the biology, epidemiology and control the post-harvest diseases. Good agriculture practices and corrective measures after harvesting, transportation and during storage reduce the fungal attack and minimize the postharvest diseases.

## International Online Training Workshop on "Modern Fruit Production Techniques"

Institute of Horticultural Sciences, University of Agriculture, Faisalabad, organized an International online training workshop on "Modern Fruit Production Techniques" with the collaboration of The Research Institute of Pomology, Chinese Academy of Agricultural Sciences (RIP, CAAS) China, on December 12th to December 14th 2022.

The training workshop was marked by Prof. Dr. M. Jafar Jaskani, Director (IHS-UAF) (Convener), Prof. Dr. Cao Yongcheng, Director General (RIP-CAAS), Prof. Dr. Zhou Zongshan, Director, Plant Protection Research Center, (RIP-CAAS), and Dr. Muhammad Azam, Associate Professor (Focal Person) IHS-UAF for this training session.

In this training workshop, more than 250 participants took part from all over Pakistan. This informative training session was attended by different institutions around the world such as Chinese Academy of Agriculture Sciences (RIP, CAAS), Selcuk University Konya Turkey, and different universities from Pakistan, viz. University of Agriculture, Faisalabad, Ghazi University, DGK, MNSUA University, Multan, The Agriculture University, Peshawar, PMAS Arid Agriculture University, Rawalpindi, College of Agriculture, University of Sargodha, Sindh Agriculture University, Tandojam, University of Poonch, Rawalakot, Karakorum International University, Gilgit-Baltistan and different research stations, viz. AARI, Faisalabad, NARC, Islamabad and Mango Research Station, Shujabad also grabbed the chance to explore new skills.

It was an informative training session on modern technologies to learn from the experiences of Chinese farmers to enhance knowledge and fruit production techniques in the country for sustainable fruit production.

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# "A Training Session on Fruit Plant Nurseries Management, Registration and Certification" organized by Department of Horticulture, College of Agriculture, University of Sargodha, Pakistan

Dr. Muhammad Azher Nawaz*, Hafiza Mubeen Hayat, Nadia Shaheen
Department of Horticulture, College of Agriculture, University of Sargodha, Sargodha, Pakistan

A training session regarding the fruit plant nurseries management, registration and certification was organized by Department of Horticulture, College of Agriculture,

University of Sargodha in collaboration with Horticulture Extension (Sargodha), Agriculture Department, Government of Punjab, on October 26, 2022. A large number of nursery growers, farmers, students and faculty members participated in this event to learn the latest trends regarding fruit plant nurseries management, registration and certification. There were about 120 registered participants in this training session. Farmers and nursery growers from different areas of Sargodha particularly participated in this training.

During inauguration, Dr. Muhammad Azher Nawaz, Incharge Department of Horticulture, College of Agriculture, UoS, welcomed the distinguished guests and participants. Mr. Shahzad, Deputy Director, Horticulture Extension, Sargodha, introduced the Horticulture Extension and on-going activities in the field. Mr. Mansoor from Federal Seed Certification and Registration Department (FSC&RD), Sargodha, shared the information regarding fruit plants nursery registration and certification process in Pakistan. He added that, in seed act 1976 and Amendment Act, 2015, fruit plants certification and registration of nurseries is mandatory. The act says that "No person shall conduct or carry on the business of horticulture nursery unless such nursery is registered with FSC&RD in coordination with Provincial Government". FSC&RD is implementing this article of the act across the country. He informed nursery growers that everyone should get his nurseries registered, however if anybody fail to do so then legal proceedings may be started against him under the law.

Mr. Abdul Rehman from Citrus Research Institute, Sargodha, delivered a talk related with best nursery management practices including soil selection, soil fumigation, soil solarization, nursery bed preparation, selection of fruits for extraction of rootstock seeds, seed sowing, seedlings transplanting, and budding and grafting of citrus plants. He said that budding height must be kept at 9 to 12 inches higher to get proper benefits of rootstock. He said that rough lemon is most commonly used rootstock for citrus but in next few years, Cox mandarin and a Citrange rootstock (C-35) will also be used as rootstock. During research trials at Citrus Research

Institute, Sargodha, these rootstocks have proved their quality characteristics as candidate rootstocks.

Dr. Muhammad Azher Nawaz, Assistant Professor/Incharge, Department of Horticulture, highlighted the importance of pruning and training of young citrus plants after transplanting in the field. He said the application of fungicides after pruning is a mandatory requirement that must be followed otherwise we cannot get the benefits of pruning citrus plants and the chances of fungal infections are maximized. He also informed the participants regarding the pruning tools that should be used. Dr. Ghulam Sarwar, Associate Professor, College of Agriculture, University of Sargodha, during his remarks congratulated the organizers for successfully managing this activity on an important issue. On behalf of administration of College of Agriculture, University of Sargodha, he payed thanks to Mr. Shahzad (Deputy Director), Dr. Basharat Ali Saleem (Deputy Director), Mr. Bilal (AO), Mr. Abdul Rehman (CRI) and the faculty and staff of Department of Horticulture for their kind support to make this event successful. The undergraduate and postgraduate students of the Department of Horticulture, College of Agriculture, UOS also took keen interest and participated in this event.

## Seminar on Germplasm Diversifcation In Horticultural Crops

Institute of Horticultural Sciences, UAF, have recently started a project funded by Punjab Agricultural Research Board (PARB) entitled "Import of High Value Germplasm and Technologies of Elite Exotic Fruits, Vegetables and Medicinal Crops for Diversification and Sustainable Production in Punjab". Under this project, IHS is collaborating with Chinese and Australian organizations including Guangxi Sub-tropical Crops Research Institute (GSCRI), Guangxi, Zhengzhou Fruit Research Institute (ZFRI), Zhengzhou and Department of Industry, Tourism and Trade (DITT), Darwin, Australia. There are five national collaborators including MNSUA, Multan and different organizations of AARI including CRI Sargodha, MRI Multan, BARI, Chakwal and VRI, Faisalabad. Different meetings have been conducted with the national and international collaborators for germplasm exchange and further enhancing mutual collaborations. A seminar was also conducted to enhance awareness about the significance of germplasm in fruit crops and 100 plants of 10 different exotic fruit crops has been distributed to the national collaborating organizations for adaptability trials and screening for new potential varieties. This project will open new horizons in the horticultural industry and enhance germplasm diversification that will help to mitigate the upcoming climate change and ensure food security.

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# Vegetable Seed Production Issues in Sindh

Memoona Islam Majeedano and Siraj Uddin Majeedano
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Seed is the most significant genetic tool for producing vegetable plant. Initially as a seed it reflects little importance but after entering in the growing environment with soil and inputs like fertilizers, irrigation, weedicides, insecticides, fungicides, it flourish to complete vegetable

crop profile, which goes on benefiting for human consumption facilitating for food nutrition. Healthy, disease free genetically pure vegetable seed availability is the basic pillar to pave the late future foundation of the crop. Technology has modernized much of farming's day operations, but without a steady supply of high quality seed, yield and crop quality would be decreased. Genetically viable seed supply can play pivotal role in the production of horticultural crops.

Characteristics such as trueness to variety, germination percentage, purity, vigour and appearance are important feature which farmers has to focus indeed for planting crops, achieving and maintaining high seed quality is the goal of every professional seed producer. Using quality seeds is a prerequisite for successful vegetable production. Although many F1 hybrid seeds used today are more expensive than open pollinated seeds used in the past. Vegetable seeds are still a rather small investment compared to other production cost. It is generally unwise to cut costs by saving a less money on seed of a substandard cultivar or by purchasing lower quality seeds. Cutting corners on seed cost will generally end up costly even more because of lost revenues from lower yields. Like so many other areas of agriculture, seed handling practices have changed dramatically over the years. From generations, farmers saved their own vegetable seed and maintained their own cultivars. More recently, seeds were often obtained from local agriculture retailers. Due to avoiding more expenses in early stage farmers are later trapped in overwhelming spend of money in shape of purchasing expensive chemicals for seed treatment.

Sindh produces only 17 percent vegetables compared with country's rest production. Mostly the vegetables are cultivated by seed during winter (rabi) and summer (kharif) seasons; higher production is dependable on good and pure seed. There are approximately 376 companies registered for vegetable seed production, out of them 4 are in public sector and 5 belongs to abroad and other related with private sector. There is no any officially institution for seed production in Sindh province. While the private institutes or companies are working in other provinces. Those are supplying the vegetables seed to Sindh for marketing. Local indigenous seed can be seen rarely, so the dire need is to collect and conduct research for its multiplication because due to scarcity of indigenous seed, the hybrid seeds had occupied the space and are frequently marketed without any hesitation. Hybrid seed can be sown once and for next cropping, new hybrid seeds are required for seeding purpose, but as compared to hybrid, indigenous seed can be sown for years, due to its potential and after harvest, in next season it can be grown successfully.

As this time genetically modified (GMO) seeds are introduced in market for grower's community. With the pace of time, those may produce dangerous situation for human health along with other fauna and flora. Those seeds are expensivly marketed and are unaffordable, especially for small grower's community. The prices of seeds are high including other inputs in vegetable production, but at the harvest growers are at loss due to lower prices of vegetables in market. Hybrid and GMO seeds production of vegetables are tasteless as compared to local / indigenous one, so the consumers dislike this kind of vegetables. It is reasonable only the way, to produce local seed in the context of vegetable, the credit can be saved by only producing the own indigenous seed.

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In the country and provinces there are many agricultural scientist, experts and few of them are producing hybrid seed within country. The research can be done for multiplication of indigenous seeds through gene bank, as the other countries are doing and producing their seeds so, whenever they desire those seeds can be used for vegetable production. There is need to establish institutions in southern and northern region of Sindh for vegetables seed production & multiplication. So the grower may have easy approach to obtaining the seed. The basic seed will be prepared and provided to private companies for multiplication and marketing. This sector can create job opportunities and consumer can get cheaper and hygienic nice vegetables. Those institutions can also arrange the training for small growers, to make them able to produce their own seed for vegetable production. It has been observed that small growers are raising nurseries of onion, cauliflower, cabbage, chillies, brinjal and tomatoes on small scale for earning money by it. Whenever they learn technique of seed producing, they use their own excess up to market.

In market, shopkeepers are selling mixture of vegetables, resulting loss to growers. Based on our suggestion if the growers follow up these steps, they may sale seed in market for their earning. The growers might get rid from the problems concern with vegetables seed production and their issues.

# Epicotyl Grafting In Mango

Noor-un-Nisa Memon and Muzamil Farooque Jamali
Sindh Agriculture University, Tandojam, Sindh

Mango is commercially multiplied by different methods of grafting such as veneer, approach and top grafting. Epicotyl grafting is one of the new techniques of grafting that has introduced and becoming the rising trend in mango propagation at world level. It is very efficient and low-cost method of grafting. This does not only saves time of the grower to wait up to one-year-old rootstocks, but it also saves labor, fertilizer and other related input investments. In mango stone-plants, the seedling-stem above the cotyledon is epicotyl. This is the region where grafting operation is performed. The stone portion contains cotyledon, while the tender stem consists epicotyl region.

This technique of grafting is different from traditional method of grafting that at very young age about one month old seedlings, grower may know its success or failure of the grafted seedlings. It is really a break through among the mango growers to produce grafted seedlings at a very young stage.

During this study, epicotyl grafting was practiced on various age of the rootstocks started from few days old to two months old. Usually in grafting, age of the rootstock and proper method of grafting has vital importance in the success of stionic establishment of the grafts. This can be practiced in shade house conditions as seedlings are very young and it can be protected from strong winds, too much low and high temperatures. It is also crucial to place seedlings in shade house after grafting as well.

**Season of epicotyl grafting**

It would be better to plant mango stones as soon as possible during the month of May to June and grafted seedlings may be better established upto October, usually young seedlings of mango may be affected due to low temperature of Nov- Jan that's why avoid grafting practice in autumn and winter.

**Steps of Epicotyl/ Stone Grafting**

- Raising of rootstocks
- Selection of desirable scion
- Application of epicotyl grafting

**1. Raising of rootstock**

In order to raise seedling rootstocks, mango stones were collected from local (desi) mango tree should be planted in May to June. The Stones should be collected from ripened fruits and dried properly at room temperature. Before sowing, stones must be treated with a fungicide. After seed germination, seedlings are allowed to grow at least 20 to 30 days and diameter must be achieved 0.4 to 0.6 cm. Better to do epicotyl grafting upto the age of 20-30 days old rootstocks. The height of the rootstock may vary but it must be in the range of 6-12 inches.

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## 2. Selection of scion

The scion should be selected from a terminal non-flowered shoot of one year old. Moreover, the diameter of the scion must be same or slightly thin than the diameter of rootstock, the leaves of the scion must be headed back and it is desirable to keep a part of the petiole intact on the selected terminal shoot. It is suggested that the selected scion may be 1.5-2 inches long. However, it depends on the height of the seedling rootstocks.

## 3. Practice of epicotyl grafting

i. The leaves of the rootstocks should be headed back leaving 3-4 inches long stem (Figure 1)

ii. A 1-2 inches longitudinal cut is made running down through the middle of the stem (Figure 2)

iii. A wedge shaped cut starting on both sides should be made on the lower part of the scion (Figure 3)

iv. The scion is then inserted in the cleft of the rootstock in a way that cambium of both part united firmly. Proper union of scion and rootstock is a significant step for the success of grafting. (Figure 4)

v. The union portion must be tied immediately with polyethylene strip. When the scion sprouts and leaves become green it indicated the success of epicotyl grafting (Figure 7 & 10)

vi. The established grafted seedlings should be kept in shade house for hardening process. Well established and vigorous seedlings may be shifted to field during Feb-March (Figure 11).

**Drawbacks**

The survival of grafted seedlings in the open field may be critical due to very young age of the seedlings and low temperature. It would be better to shift in the field during the month of Feb- March, for the better establishment and smooth growth.

Fig. 1: Headed back rootstock

Fig. 2: Longitudinal cut on rootstock

Fig .3: Wedge shape cut on the lower part of scion

Fig . 4: Insertion of wedge shape cut in the rootstock

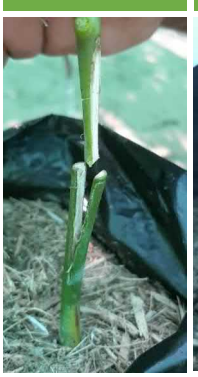

Fig. 5: Scion Rootstock Union

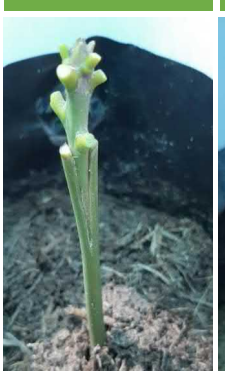

Fig. 6: Union tied with polyethylene Strip

Fig . 7: 8 days old graft

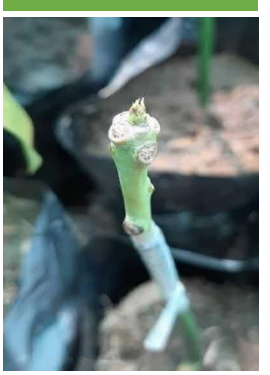

Fig . 8: 15 Days old graft

Fig . 9: 20 days old graft

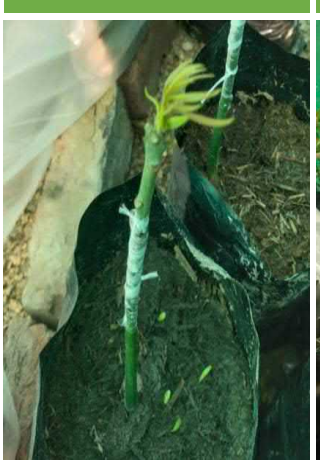

Fig. 10: 35 days old graft

Fig. 11: Hardening in shade house

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# Xeriscaping - A Sustainable Landscaping Arena in Changing Climates

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Xeriscaping, a term coined by Denver Water in 1981, is a landscape which utilizes least amount of water with highest efficacy by growing native or low water requirement plants. In historic context it is only used in arid zones but now it becomes a much desired option in urban landscape designs. The term xeriscape is often misleadingly taken as zero scape or zero scaping, which means the landscape is based mainly on hardscape elements with rare or no plants at all which is quite opposite to xeriscape.

## Conceptual Outlook

The xeriscape is itself a unique type of landscape based on the following principles:

### ❋ Water Use Efficiency

The xeriscape design focuses on the irrigation source along with less, infrequent and deep irrigation to fulfill plant water requirements.

### ❋ Plant Selection

Xeriscape accommodates a large variety of native plants which are deep rooted along with different of cacti and succulents. It also includes plant groups from trees to ground covers with less water requirements.

### ❋ Soil Amendments

The design of xeriscape always includes different kinds of natural and organic materials such as old compost, shredded wood bark, sawdust, wood ash, rice straws as mulch etc. which increases porosity, water retention capacity and organic matter of the particular soil available at site.

### ❋ Mulching

Mulching is the most important component in xeriscape besides irrigation as it prevents evapotranspiration, holds water in soil, retain soil moisture and reduces irrigation frequency. They may include pavers, grindstones, wood barks, pine needles etc. depending on their particular function.

## Benefits Over Traditional Landscape

The use of xeriscape is now increasingly popular in the landscaping world because of its undeniable prospects over traditional landscape practices.

### ❋ Water Resource Management

The primary objective of xeriscape is to reduce the amount of water use by increasing the water use efficiency of soil. It uses up to 50% less water as compared to regular turf and exotic landscapes. Its water requirement is as low as 60% as compared to grasses, which is the non-food crop in USA at an area of 128000 $Km^2$.

### ❋ Mitigation of Heat Effect

As compared to traditional landscapes, xeriscape provides excellent cooling of the urban suburbs due to excellent space utilization when compared to turf surfaces, which is a common sight in parks and other residential spaces.

### ❋ Low maintenance

The other important aspect of xeriscape over traditional landscape design is that, they require less care due to encompassing of native plants which require much less care during growth as they are resistant to pertaining environment when compared to exotic induced plants which are more prone to diseases. Beside this, they maintain their beauty during water shortage and requires less cultural practices in long run.

### ❋ Economically Viable

The xeriscape design mostly includes native plants which are cheap as compared to exotic plants. In the long run, these plants are self-maintained such as succulents and most of Cacti species. A study revealed that the cost of maintenance is dramatically reduced to 55% annually using xeriscape techniques.

### ❋ Biodiversity

Xeriscape offers a wide range of different plants when compared to regular designs which are only limited to certain number of plants. Furthermore a natural biosphere is formed using native plants which is beneficial for the environment rejuvenation.

## Misconceptions Regarding Xeriscape

There are many misconceptions stated below regarding the term xeriscape, which are not even near to the truth:

### ❋ Excessive Use of Desert Species

Xeriscape comprises of different plant species in which there are some plants from succulents and cacti group. However, they represent only a part of whole plants used; native plants are also preferred due to their adaptability towards the environment.

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## Elimination of Turfs

Turf is indeed the most common entity in today's landscape. The implication of xeriscape does not completely negate the turf or grass as a whole in landscape yet it enhances the overall beauty when executed along with patches of turf side by side. Hence more space is utilized with this combination and turf is sometimes complemented with certain sedges, ground covers etc.

## ❋ Impact on Property Value

The impact of using xeriscape in residential and other spaces is much positive negating the overall presumption of general public which are particularly prone to lavish and Iconic living in different parts of the world. Xeriscape is mostly done in relatively small spaces (backyards, lawn corners, contours etc.) with maximum number of plant in an area which enhances the beauty of the property while complementing the overall scenic landscape.

## ❋ Impact on Environment

People are now more environment sensitive but they are mostly unaware of xeriscape in its true meaning and think of it as a mixture of some desert plants with large area left unturned by pavers or other inorganic mulches. In reality, xeriscape promotes native vegetation with minimal space left which indeed form a natural biosphere reviving the biodiversity of the locality.

## Systems of Irrigation

The system of irrigation used mostly in xeriscape is drip irrigation which is maintained automatically according to water requirement of different plants using sensors and is well organized and installed before transplantation.

## Use of Mulch

Mulch is an important aspect of xeriscape, as it amplifies water use efficiency, maintains moisture in soil, stops evapotranspiration and also complements the overall design. Mulch layer should be 2-3 inches if inorganic mulch such as gravel, pavestones etc. and it can be increased up to 4 inches if using organic mulch like pine needles, rice straws, bark wood chips, older compost or any other depending on the soil condition. Organic mulches are more efficient and compatible with xeriscape.

It can be concluded that Xeriscape is indeed the most needed innovation in this drastically changing environment. We need to emphasize on the use of xeriscape as an excellent landscape technique which is cost effective, environment friendly and most importantly minimal resource using entity such as water and land with maximum output.

## 2۔زمین میں غذائی اجزاء کا تناسب پوری کرنے والی سبزیاں

ان سبزیوں کی جڑوں پر موجود بیکٹر یا ہوا سے نائٹروجن لے کر اسے پودوں کے لیے قابل استعمال شکل میں تبدیل کرتے ہیں یہ پودے زمین میں نائٹروجن کی کمی کو پورا کرتے ہیں اور زمین کی زرخیزی کو برقرار رکھتے ہیں اس گروپ میں مٹر، لوبیا اور سویابین شامل ہیں۔

## کم غذائی اجزاء استعمال کرنے والی سبزیاں

اس میں تمام جڑوں والی سبزیاں آتی ہیں جیسے کہ لہسن، پیاز، مولی، گاجر، شلجم اور چقندر ہیں۔ یہ سبزیاں تھوڑی مقدار میں غذائی اجزاء استعمال کرتی ہیں اور اگلی فصل لگنے سے قبل زمین کی زرخیزی کو مستحکم کرتی ہیں۔

عموماً سبزیات کی گردش کا دورانیہ تین یا چار سال تک جاتا ہے کیونکہ زمین میں پلنے والے کیڑوں اور بیماریوں کو بے ضرر سطح تک لانے میں اتنا عرصہ لگ جاتا ہے۔

مثال کے طور پر اگر غذائی ضروریات کے مطابق سبزیوں کی گردش کریں تو وہ کچھ اس طرح سے ہوگی۔

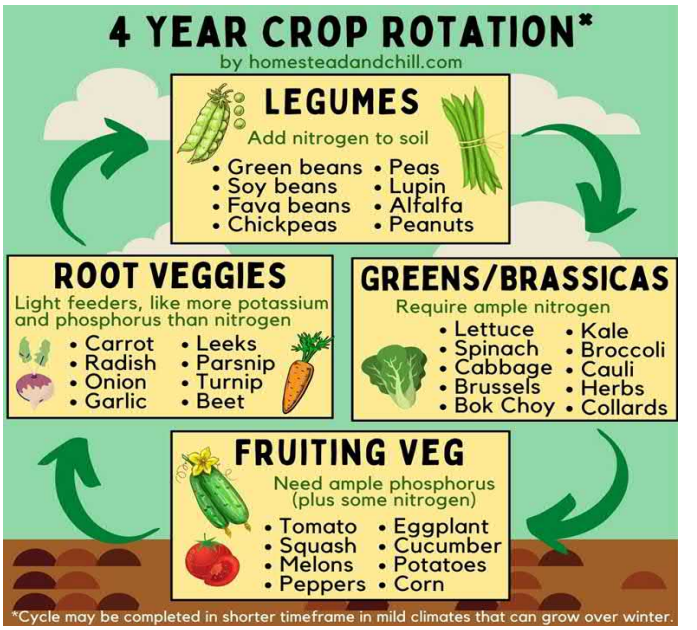
☆ پہلے سال میں زیادہ مقدار میں نائٹروجن چاہنے والی سبزیاں جیسے کے ٹماٹر، مرچیں، بھنڈی، بروکلی، سلاد پتہ وغیرہ لگائیں۔

☆ دوسرے سال میں زمین میں نائٹروجن بڑھانے والی سبزیاں (پھلی والی) مٹر، لوبیا لگائیں۔

☆ تیسرے سال میں پھلی والی سبزیوں کی برداشت کے بعد جڑ والی سبزیاں گاجر، چقندر، لہسن اور مولی لگائیں۔

☆ چوتھے سال دوبارہ سے ٹماٹر لگالیں تاکہ وہ غذائیت سے بھرپور زمین سے فائدہ اٹھا سکیں۔

| ٹماٹر | مٹر | پیاز | ٹماٹر |
|---|---|---|---|
| پہلا سال | دوسرا سال | تیسرا سال | چوتھا سال |



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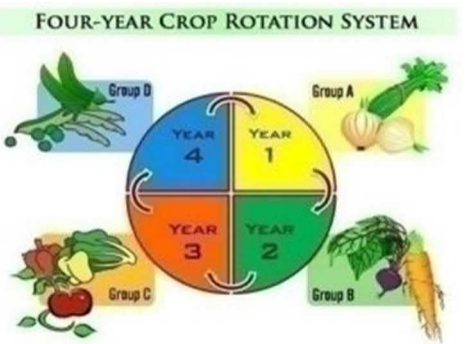
# سبزیات کی گردش

نجی اللہ خان، عائشہ منظور، محمد ثاقب نوید، رانا محمد اظہر علی
بارانی زرعی تحقیقاتی ادارہ، چکوال

سبزیوں کی گردش مٹی کی صحت کو بہتر بنانے، مٹی میں غذائی اجزاء کو بڑھانے، جڑی بوٹیوں کے اگاؤ اور کیڑوں اور بیماریوں کے حملے کو روکنے کے لیے زمین میں ہر سال مختلف قسم کی سبزیاں لگانے کے عمل کو کہتے ہیں۔ مزید یہ کہ اس طریقہ کار کے ذریعے سبزیات کے گروپس کو ان کی ضرورتِ کاشت کے مطابق ترتیب دینے میں مدد ملتی ہے۔




فصل کی گردش میں ہر موسم میں کھیت کے اندر سبزیوں کے پودے لگانے کی جگہ کو تبدیل کرنا شامل ہے۔ فصل کی گردش کا استعمال کیڑے مکوڑوں سے ہونے والے نقصان کو کم کرنے، بیماریوں کی نشوونما کو محدود کرنے اور مٹی کی زرخیزی کو منظم کرنے کے لیے کیا جاتا ہے۔ مثال کے طور پر کھیت میں سال بہ سال ٹماٹر لگانے سے اس پر مخصوص قسم کی بیماریوں اور کیڑوں کا شدید حملہ ہوسکتا ہے۔ اس لیے اس سے بچنے کے لیے اگلے موسم میں اسی کھیت میں کوئی اور فصل جیسے کہ گاجر، گوبھی، پیاز وغیرہ لگائیں اور پھر تیسرے موسم / سال میں دوبارہ ٹماٹر کاشت کرلیں۔

سبزیات کی گردش سے مختلف فوائد حاصل ہوسکتے ہیں۔

## جڑی بوٹیوں سے بچاؤ

مختلف سبزیوں کے مختلف طریقہ کاشت مخصوص قسم کی جڑی بوٹیوں کے اگاؤ کو روکنے میں مددگار ثابت ہوتا ہے۔ مزید یہ کہ کدو اور توری جیسی فصلوں کا زیادہ پھیلاؤ اور بڑے پتے بھی جڑی بوٹیوں کی بڑھوتری کو روکنے میں معاون ثابت ہوتے ہیں۔

## فصل کی ناکامی کے امکانات کم ہوتے ہیں

ایک ہی قسم کی سبزی بار بار ایک جگہ پر لگانے سے اس کی افزائش اور پیداوار بری طرح سے اثر انداز ہوتی ہے۔ لہٰذا سبزیات کی گردش کی وجہ سے ان امکانات کو کم کیا جاسکتا ہے۔

## مٹی کی زرخیزی کو برقرار رکھنا

ہر سبزی کی غذائی ضروریات مختلف ہوتی ہیں لہٰذا ہر سال فصل بدلنے سے مٹی میں غذائی اجزاء کی کمی کو دور کیا جاسکتا ہے۔

## بیماریوں اور کیڑوں کا حملہ کم کرنا

کیڑے مکوڑے اور بیماریاں کچھ سبزیوں کے گروپ پر ہر سال حملہ کرتی ہیں۔ فصل کی گردش کی وجہ سے ان کے مخصوص پودے (Host) جن پر یہ حملہ کرتے ہیں کہ غیر موجودگی ان کے انڈوں اور نباتی تولیدی خلیے (Spores) کے پھیلنے میں کمی کرتا ہے۔

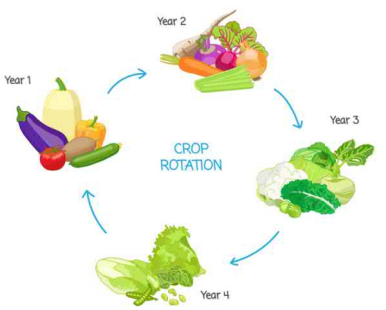
سبزیوں کی گردش کرنے کے لیے مندرجہ ذیل باتوں کا خیال رکھنا چاہیے۔

## جڑوں کی گہرائی

جیسے کہ پہلے بتایا جاچکا ہے کہ سبزیوں کی گردش زمین کی صحت اور ساخت کے لیے مددگار ہے چنانچہ مختلف جڑوں کی گہرائی والی سبزیوں کی کاشت زمین کو ہموار بناتی ہے۔ اس لیے زیادہ گہرائی میں جانے والی سبزیاں جیسے کہ ٹماٹر، چقندر، گاجر زیر زمین غذائی اجزاء حاصل کرنے کے لیے زمین میں ہوا اور پانی کے لیے رستہ بناتی ہے، جو کہ اگلی لگنے والی فصل کے لیے فائدہ مند ہوتی ہے۔

## زمین کی زرخیری کے مطابق

جڑوں والی سبزیوں (مولی، گاجر، پیاز) کو ایسی زمین میں لگانے سے اجتناب کریں جو بہت زرخیز ہو کیونکہ اس وجہ سے ان میں پتوں کی پیداوار زیادہ جبکہ جڑ کا بننا کم ہونا ہے۔ ضروری یہ ہے کہ ایسی زمین میں زیادہ غذائی اجزاء استعمال کرنے والی سبزیات (پالک، پھول گوبھی) کاشت کریں کیونکہ یہ سبزیات مرکبات کو توڑ کر آنے والی فصلوں کے لیے غذائی اجزاء کو آسانی سے دستیاب بنادیتی ہیں۔




## غذائی ضروریات کے مطابق

سبزیوں کی گردش میں ہمیشہ زیادہ غذائی اجزاء استعمال کرنے والی سبزیوں کو کم غذائی اجزاء استعمال کرنے والی سبزیوں کے ساتھ ادل بدل کر کے لگانا چاہئے تاکہ زمین میں ان اجزاء کا تناسب برقرار رہ سکے اس حساب سے سبزیاں تین گروپس میں تقسیم ہیں۔

## 1۔ زیادہ غذائی اجزاء استعمال کرنے والی سبزیاں

اس گروپ میں پالک، بھنڈی، سلاد پتہ، تربوز، ٹماٹر اور مرچیں آتی ہیں ان سبزیوں کو پتے بنانے اور پھول اور پھل کی بڑھوتری کے لیے زیادہ مقدار میں نائٹروجن چاہیے ہوتی ہے۔

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## 7th International Horticulture Conference(IHC), 2023


Pakistan Society for Horticultural Science (PSHS), in collaboration with "Department of Horticulture, MNS-University of Agriculture, Multan", is organizing "7th International Horticulture Conference" on February 23-25, 2023. There will be keynotes, technical sessions (talks and posters), and PSHS Annual General Meeting. Good quality papers will be selected for publication in 'Journal of Horticultural Science and Technology' following journal peer review guidelines. Please visit event web page for further updates.

https://www.pshsciences.org/event/ihc2023/

Abstracts can be submitted online till February 07, 2023 by following weblink https://www.pshsciences.org/publications/ihc2023_abstract/ .

Registration will be required to attend this event. Early-bird registration discounts are valid till February 07, 2023. Please follow the link below for online registration

https://www.pshsciences.org/publications/ihc2023_registration

PSHS members will get further discount in registration fee. So, you are encouraged to purchase PSHS membership to get discount in conference registration fee and to reap society benefits as well. Online application for PSHS membership is available at following link.

https://www.pshsciences.org/membership/register/

Looking forward to see you all at this mega annual event of the society, which will be one of least platform to discuss horticultural issues, networking, future collaboration and was forward to boost our national horticultural industry.



Hi-Tech Hydroponic vegetable production at MNSUA, Multan


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