

PANT RESEARCH NEWS



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DIRECTORATE OF RESEARCH
GBPUAT, PANTNAGAR

Dean Agriculture Message

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Dr. S. K. Kashyap, Dean Agriculture

G.B. Pant University of Agriculture & Technology, Pantnagar is basically known for the research acumen and achievement, which has led the country towards food and nutritional security. It is distinct about the university that illustrious scientists are dedicating their potential for upbringing improved technologies in niche areas of agriculture. The university has retained its glory as a seat of excellence across into the country and has been contributing significantly for innovations in agricultural sciences.

—Contd on Page 2

Editor's Desk



Dr. S. P. Singh, Editor-in-Chief

It is matter of immense pleasure that Pantnagar University is going to organize XXXIII Convocation on NOV17, 2020. The editorial team congratulates every degree and medal recipients and wishes success in their future endeavour. Three "S" i.e. Students, Seed and Scientists are the backbone of the University. Pantnagar University, the best in country contributed towards the advancement of National Agriculture through untiring, skillful, sincere and honest devotion. Indian agriculture has achieved a growth rate of 3.4 per cent at constant prices in the first quarter of 2020-21.

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Dean's Message

I feel proud to declare that the College of Agriculture of the university has contributed the maximum out of the achievements of this university. The 11 departments and more than 150 faculty members of the college are aligning hand to hand for the development of rural India through brilliant teaching, illustrious researches and prolific extension work. I put my words of greetings for the scientific community of the college and the university for their untiring and utmost endeavours along the year, which will continue and flourish, so that we remain relevant in front of the upcoming challenges of productivity, sustainability, profitability and environmental adversity.

Editor's Desk

The export of essential agricultural commodities during September, 2020 has seen a jump of 81.7% in September at Rs 9,296 crore as against export of Rs 5,114 crore in 2019. Major commodity groups, which have recorded jump in exports are non basmati rice- 105%, basmati rice- 13%, ground nut- 35%, refined sugar- 104% and wheat- 206%. This represents the rosy picture of Indian agriculture and is the testimony of hard work of agricultural scientists. Pantnagar is known for hard work and its commitment towards serving farming community which has transformed the university as Institution of National Importance.

The demand of fortifying seeds with different minerals, vitamins and other immune buster elements is on the rise due to present and future need of the population. Pantnagar University has geared up for production of fortified seeds which are aiming to nutritional value in this era of health awareness. Scientists are developing various agro-techniques and vaccines to serve the farmers of Uttarakhand.

"Agriculture was the first occupation of man, and as it embraces the whole earth, it is the foundation of all other industries" — *Edward W. Stewart*

"Agriculture has become essential to life; the forest, the lake, and the ocean cannot sustain the increasing family of man; population declines with a declining cultivation, and nations have ceased to be with the extinction of their agriculture" -- *Elias Hasket Derby*

Research Story

Successful Cultivation of Monkey Head Mushroom (*Hericium erinaceus*)



Dr. K.P.S. Kuswaha

Professor, Department of Plant Pathology
College of Agriculture

Hericium erinaceus commonly known as monkey head mushroom, successfully cultivated at Pantnagar using wheat straw. This is a very exceptional mushroom and declared in the red list of endangered species in various European countries. This mushroom contains a number of polysaccharides, such as B- glucan, heteroglucans, heteroxylans, as several cyanthane derivative *triterpenes* known as hericenone and erinacine. Monkey head mushroom is a choice edible when young and the texture of the cooked mushroom is often compared to seafood.

This is rich in some physiologically important components, especially B- glucan polysaccharides, which are responsible for anti-cancer, immune-modulating, hypolipidemic, antioxidant and neuro-protective activities of this monkey head mushroom. This mushroom has also been reported to have anti-microbial, anti-hypertensive and anti-diabetic.



Monkey Head Mushroom is rich in some physiologically important components, especially B- glucan polysaccharides, which are responsible for anti-cancer, immune-modulating, hypolipidemic, antioxidant and neuro-protective activities of this monkey head mushroom. This mushroom has also been reported to have anti-microbial, anti-hypertensive and anti-diabetic, properties.

For cultivation of the monkey head mushroom. the substrate that is wheat straw moist with clean water up to 65% moisture content thoroughly. After that the moist substrate supplemented with 5% wheat bran on dry wt. basis of wheat straw. The supplemented substrate is filled in poly propylene bags @ 2kg per bag. These bags are plugged with non-absorbent cotton by inserting a ring on the mouth of the bag.

Contd—

Research Story

These, bags are then autoclaved at 22 psi for 1.5-2.⁰ hrs for sterilization. Spawning is done in the sterilized bags with grain spawn @ 4% of the ready substrate by inoculation method. The spawned bags are then incubated at 24+1⁰ C for spawn run. Spawn run completed in 20-25 days. After complete spawn run the bags are opened for fruiting. The optimum temperature for fruiting is around 16-22⁰ C in the crop room is maintained which is normally available during Nov-Feb. The mushroom fruiting body appears after 10-12 days of bag opening which is ready for harvesting within 4-5 day.



Steps in cultivation of Monkey head Mushroom

1. Wheat / Supplemented with 5% wheat bran.
2. Wet the substrate up to 65% moisture content
3. Bag filling with substrate @ 2kg/bag
4. Autoclaved at 22. Psi for 1.5-2.0 hrs
5. Spawning with grain spawn (@ 3% spawn on the basis of wet wt. of substrate)
6. Incubation of spawned bags (At 23-25⁰ C temperature high CO₃ and complete darkness)
7. Spawn run (20-25 days)
8. Bag Opening
9. Watering spraying
10. Fruiting/Pinning (16-22⁰ C) RH 80-85%(After 10-12 days of bag opening)
11. Mature mushroom

Research Story

ICAR-NBPGR registered novel germplasm of wheat and barley developed by Pantnagar



Dr. J.P. Jaiswal

Professor, Department of Genetics & Plant Breeding
College of Agriculture

ICAR-National Bureau of Plant Genetic Resources (NBPGR), New Delhi in its XXXXI meeting held on Sept 29, 2020 in the chairmanship of Dr T.R. Sharma, Dy. Director General (Crop Sciences), ICAR, New Delhi recommended two novel germplasm one each of wheat (UP 2994) and barley (UPB 1070) for their registration considering their novel attributes, which are developed by the wheat and barley scientists of Pantnagar.

Contributing Team

Dr. Swati, SRO, Genetics & Plant Breeding

Dr. Anil Kumar, SRO, Genetics & Plant Breeding

Dr. R.S. Rawat, Ex. Professor, Genetics & Plant Breeding

Sri K.V. Singh, Jr. Scientist , Genetics & Plant Breeding

Wheat Germplasm UP 2994: A novel genetic stock with multiple quality traits (high protein, zinc and iron content and other desired quality traits).

Improving the nutritional quality of staple food crops is now getting attention for combating the prevailing malnutrition in a very large population in developing countries. Since wheat is one of the major staple foods around the world and is the major source of nutrients such as protein and micronutrients, wheat and its nutrients are the target traits for improvement whenever strategies to improve nutrient deficiencies are addressed.

Important quality attributes of UP 2994

UP 2994 was evaluated in quality component screening nursery (QCSN/QCWBN) continuously for three years (2016-17, 2017-18 & 2018-19) and it possessed/ showed high protein content consistently for three years, i.e. 15.1% in 2016-17, 14.0% in 2017-18 and 13.9% in 2018-19, with a mean protein content of 14.33%. In addition to high protein content, it also possesses high iron content of 49.0 ppm, which is higher by 4.20ppm in comparison the best check, WB 2 (44.8 ppm). It is also rich in another important micronutrient i.e. zinc, with 43.5 ppm. **Contd—**

Research Story

This material was developed at GBPUA&T, Pantnagar by pedigree breeding method. The parentage of this material is HUW 636/PBW 651. UP 2994 has been observed possessing other desirable quality traits in national nurseries during 2016-17 and 2018-19 viz., the grain appearance score (6.7), hectolitre weight (80.7 kg/hl) and sedimentation value (59.5 ml) averaged over 3 years. High protein content along with high sedimentation value makes this germplasm will help in the production of wheat varieties with enhanced bread making quality.

Morpho-agronomic characteristics of UP 2994

Foliage colour of UP 2994 is dark green with intermediate growth habit and there is no anthocyanin pigmentation of auricle. Its flag leaf attitude is semi erect type with medium length and width of flag leaves. It possesses medium length ears and has tapering ear shape in profile. It takes an average of 81 days for 75% flowering. It is superior in tillers numbers (107 tillers/meter), 1000 grain weight (41g) and grain yield (433g/m²) to all the checks viz., UP 2672, C 306, NIAW 1415 and HS 490. (AICRP-W&B, Progress Report, Crop Improvement, 2019).

Barley germplasm UPB 1070: A novel genetic stock possessing high level of yellow rust resistance and high yield potential.

Barley is a nutritionally rich crop and adapted to the marginal soils and drought affected areas. Yellow rust is a devastating foliar disease of barley, caused by *P. striiformis* f. sp. *hordei*. It causes severe yield losses particularly in Northern hills and adjoining plains. Due to multicyclic nature of the disease and marginal status of the crop chemical control is not feasible, resistance breeding is highly required for combating this disease. For combating the threat of yellow rust, identification and deployment of novel sources of resistance is required in the existing breeding programs.

Rust resistance attributes of UPB 1070

UPB 1070 was recognized as a confirmed source of yellow rust resistance on the basis of two year testing under All India Coordinated Wheat & Barley Improvement Project. It was found highly resistance to yellow rust with an ACI of 0.04 in National Barley Disease Screening Nursery (NBDSN) in 2017-18 and with ACI of 0.0 in Elite Barley Disease Screening Nursery (EBDSN) in 2018-19 with a sound agronomic background. UPB 1070 was developed at GBPUA&T, Pantnagar through pedigree method utilizing hybridization between two parental lines viz; Dolma and BH 947 followed by selection.

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Research Story

Morpho-agronomic and other desired traits of UPB 1070

UPB 1070 was evaluated in Co-ordinated Trials (AVT-RF-NHZ) in Northern Hills Zone under timely sown rainfed conditions during 2017-18 with an average yield of 29.2 qtls/ha stood at 4th rank and formed the first non-significant group and as at with the best check, HBL 113 (29.3 qtls/ha), however, it has shown superiority in yield over the remaining three checks, BHS 352, BHS 400 and VLB 118 by 34.5%, 8.0% and 9.5%, respectively. It is a six-rowed yellow grain colour barley with 103-154 days to heading, 140-197 days to maturity with a plant height of 47-100 cm, 44-238 tillers per meter and 33-46 gm 1000 grain weight.

In addition to yellow rust resistance, UPB 1070 showed moderate level of resistance against leaf blight and has exhibited the highest bold grain percentage (89.4%) in Co-ordinated Trials (AVT-RF-NHZ) 2017-18, a trait which determines the overall grain plumpness, an associated trait of malt quality. UPB 1070 has very high tillering capacity with maximum tillers per meter (84) among the test entries in AVT (RF-TS)-NHZ, and possessed higher thousand grain weight (41g) in comparison to both the checks, BHS 380 (34g) and HBL 276 (28g).

Fruit bagging in litchi: A practical approach for quality production



Dr. Satish Chand

S.R.O, Department of Horticulture
College of Agriculture

Litchi is an important crop which is acclimatized to subtropical region of India. It is being cultivated in Bihar, West Bengal, Jharkhand, Uttarakhand, Chhattisgarh and Orissa on commercial scale. The crop is specific to its climatic requirements therefore, known as “Queen of subtropical fruits”. The rate of litchi in market depends upon the quality of produce. Fruit bagging is an important technology that aids in improving the fruit quality along with various benefits.

What is fruit bagging?

Fruit bagging the process of covering of one month old panicles/cluster of litchi fruits using polypropylene bags.

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Research Story

The polypropylene bags under consideration should be 550-600 mm in length, 420-500 mm with and 25-30 gms thickness having. For quality produce, pink colour polypropylene bags are being advised by National Research Centre on Litchi, Muzaffarpur, Bihar. Use of bags creates a geological barrier to direct sunlight, hot winds and insect-pests. Therefore bagging technology has found promise for litchi production under odd climatic conditions. Since, bags creates favorable climatic condition for quality litchi production.



Benefits of fruit bagging

The problem of fruit cracking in bagged fruits are negligible.

Reduced infestation of insect pests and diseases.

Reduction in use of harmful pesticides.

Increase introduction of grade-A litchi fruits.

Fruits of uniform colour and ripening are obtained.

How fruit bagging in litchi is carried out?

Under Uttarakhand condition, Rose Scented cultivar of litchi is being grown at commercial scale. One month old litchi fruits having pea size is most appropriate stage for bagging of litchi fruits.

The attached fruit clusters are placed in polypropylene bags 550-600 mm in length, 420-500 mm with and 25-30 gsm thickness and tying is carried out using packthread or simple thread. Here thing to kept in mind is that the lower part of the cluster should not come in contact with polypropylene bag. Under Uttarakhand conditions, flowering takes place in January-February, hence bagging should be practiced in the fruit developmental stages *i.e.*, mid-April to mid-May. Time to time field visit need to be done. The field operations are carried out as per package and practices.

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Research Story

Harvesting of litchi

Harvesting of litchi clusters is done with help of secateurs from the 20-30 cm backward from point of tying. The storage life of the bagged fruits may be extended to some extent. Farmers can earn huge profit after selling of quality litchi produce.

Outer Membrane Proteins as a Target for Development of Sub-Unit Vaccine against *Salmonella*:

Contributing Team

Dr. G.K. Singh, Vice-Chancellor , DUVASU, Mathura & Ex- Dean, CVASc , Dr. Anil Kumar, Director, RLBCAU, Jhansi & Ex. Prof & Head, MBGE, Dr. S.P. Singh, Professor, Dr. Avadhesh Kumar, Professor, Dr. Balwinder Singh, Professor, *Dr Mumtash Kumar Saxena, Professor*, Dr. Seema Agarwal, Associate Professor, Dr. Meena Mrigesh, Assistant Professor, Dr. Aman Kamboj, Assistant Professor, Dr. Shiv Dubey, Assistant Professor, Dr. Richa Jha, Ph.D. Scholar, Dr. Mamta Pandey, MVSc Schlor, Dr. Shantanu Tamuly, Ph.D. Scholar, Dr. Ruby Chauhan, Ph.D. Scholar, Dr. Yashpal Singh, Young Scientist, Dr. Anjani Saxena, Women Scientist, *College of Veterinary & Animal Sciences*

Salmonella is one of the major foods and waterborne pathogens, causing diseases in human beings and animals. It does not only cause mortality but is also the reason for significant economic reverses all over the globe. Like other bacterial diseases, several antibiotics have been used for the treatment of diseases caused by *Salmonella*, but as the organism has a tendency to develop resistance against antibiotics, complications in the treatment are increasing day by day and making the situation grimmer. Vaccination seems to be a possible remedy, but the vaccines available for administering to humans as well as animals have their own limitations such as short term immunity, high cost of vaccine and failure in providing efficient mucosal immunity. In our two research projects during 2005-2010, funded by the Department of Science and Technology and Department of Biotechnology, Government of India, we could deduce that the field isolates of *Salmonella* were exhibiting very high genetic variations and resistance for commonly used antibiotics. Therefore, for further research in the area of vaccine development against *Salmonella* caused disease, we searched for a conserved and immunogenic protein in the bacteria.

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Research Story

As Outer membrane proteins have been reported to be conserved in nature and have exhibited immune-potential in few available literature reports, we targeted two outer membrane proteins viz. Omp 28 and Omp C. Both of the recombinant proteins were expressed and purified successfully. The immune-potentials of Omp 28 and Omp C were tested in lab animal models (mice and rabbits) and poultry birds, respectively. Omp 28 and Omp C produced a high humoral immune response and OmpC reduced the mortality in poultry birds and delayed the shedding of *Salmonella*; however, could not check complete mortality and shedding of *Salmonella* from poultry birds. For further improvement in vaccine formulation, efforts were made to develop a mutant vaccine targeting *Salmonella*'s virulent genes using lambda recA recombinase system, but the desirable could not be achieved. But at the same time, we also initiated a parallel approach using a nano-adjuvant system in combination with the Outer membrane proteins of *Salmonella*. We have used nano-adjuvanted recombinant Omp 87 vaccine formulation in the case of *Pasteurella multocida* earlier in which nanoparticles, composed of calcium phosphate and protein (Omp 87) were found to be safe and they produced better protection in comparison to conventional adjuvant based vaccine formulation. In the case of *Salmonella*, we used total outer membrane proteins and those adjuvanted with calcium phosphate nanoparticles. The particles were characterized for their shape, stability and purity by using Electron Microscopy, Dynamic Light Scattering and Energy Dispersive X-ray spectroscopy, respectively. The vaccine formulation was evaluated for their protein loading efficiencies and their abilities to provoke cell-mediated and humoral immune responses in mice model. The Ca-NPs-Omps complex was found to be stable, pure and sized well with the range of nanoparticles. This Ca-NPs-Omps complex produced an efficient cell-mediated as well as a humoral immune response. This vaccine formulation was found to be safe as it did not cause tissue reaction or any significant toxicity in vital organs like kidney and liver, as indicated by a study of organ specific biomarkers. The significant reduction in the bacterial load in target organs depicted the promising protective efficacy of the vaccine formulation. The findings of research work on Outer membrane proteins and nanoparticles have been published in good quality National and International Journals and have been appreciated at various scientific fora and societies. In the same continuation, a product patent has also been filed in the year 2018 for the same. Our research group has recently been assigned another research project viz. Synthesis, characterization and testing of immune-potential of nano-particles adjuvanted oral vaccine of *Salmonella* Typhimurium in poultry,

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Research Story

by Department of Science and Technology, Government of India for further improvement in the vaccine formulation. The project is targeting further modification of nanoparticles to explore the possibility of the development of oral vaccine formulations with even better mucosal immunity to avoid the shedding of *Salmonella* from poultry birds.

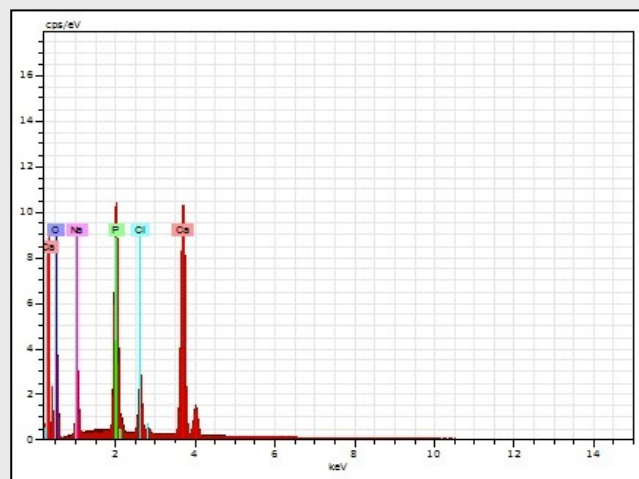


Fig: EDX spectra depicting high purity of calcium phosphate nanoparticles-Omp complex

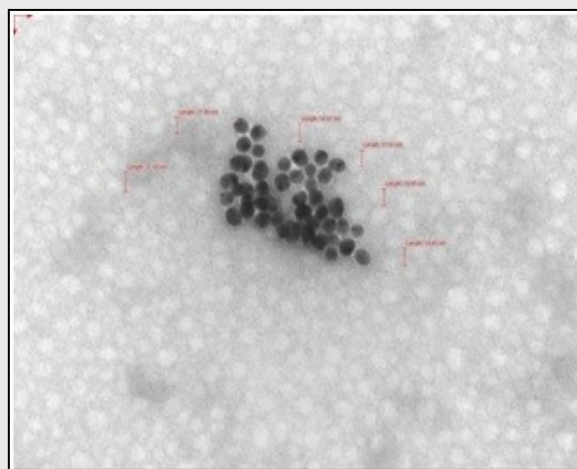


Fig: EDX spectra depicting high purity of calcium phosphate nanoparticles-Omp complex

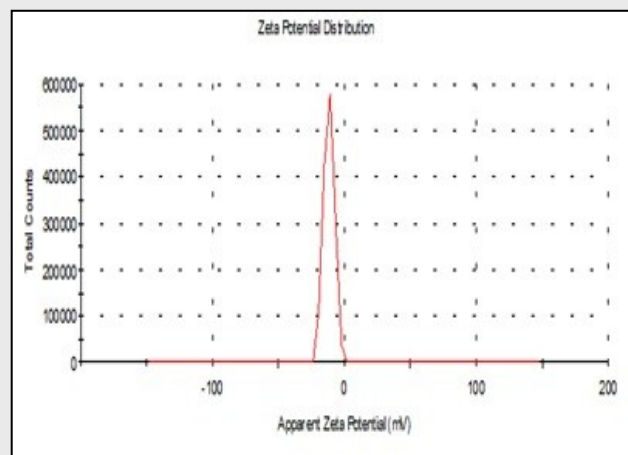


Fig: Zeta potential analysis revealing high stability of calcium phosphate nanoparticles-Omp complex

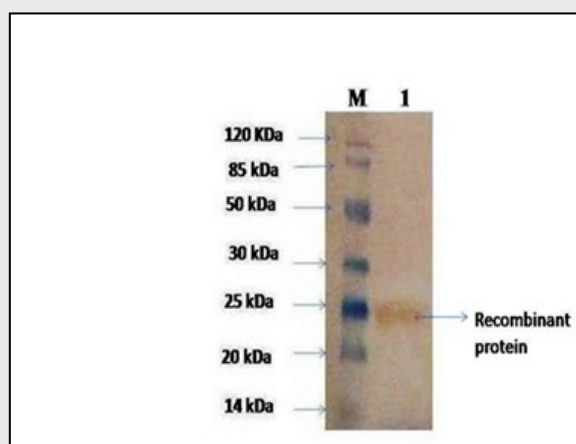


Fig: Western blot analysis of recombinant membrane protein of *Salmonella*. Lane M: Prestained marker, Lane 1: Purified recombinant outer membrane protein 28

Research Story

Development of UV Protective scarf masks



Dr. Manisha Gahlot

Professor, Department of Clothing and Textiles

College of Home Science

Dr. Manisha Gahlot Professor worked on Utilization of local plant sources for UV protective finish under AICRP- Home Science (Clothing and Textiles Component). Nowadays awareness regarding the protection against harmful UV radiation is rapidly increasing. The protective property of clothing against UV radiation has been the subject of considerable research. UV protection, to a greater or lesser extent, is determined by the fiber type and chemical composition, fabric construction, additives, textile processing aids, color, and fabric finish. This work focused on enhancing UV-protection properties of cotton fabric through application of herbal finish. Due to growing consumer demand for comfortable, safe and eco friendly textiles, search for natural sources such as plant extracts with UV protective properties has increased. *Jamun* leaf extracts came out as an excellent natural sources against harmful UV protective rays.

Research story

Survey was conducted in the Lamjala village of Nainital district, it was observed that farm women of Lamjala village spent 4-6 hours in the sun light while working in the field. These women were very vulnerable to the harmful effects of the UV rays. So AICRP-CT has developed UV Protective scarf mask for the farm women. The scarf masks were developed from cotton fabric on which UV Protective finish using *jamun* leaf extract was applied.

Jamun (*Syzygium cumini*) leaf extract was prepared to be used as UV protective finish on cotton fabric using exhaust method. Finishing parameters such as concentration of *Jamun* (*Syzygium cumini*) leaf extract, treatment time, temperature and concentration of cross linking agent was optimized and finished fabric was evaluated on the basis of **ULTRA VIOLET PROTECTION FACTOR (UPF)**. The Ultraviolet protection factor of this finished fabric was found to be excellent (UPF: 51) at 7% (conc. of *Jamun* extract), (6 % conc. of citric acid) for 60 min treatment time at 90°C temperature. It can be concluded from the results that treated fabric can be used successfully by farm women working in fields for protection against UV rays.

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Research Story

Development and distribution of scarf mask

Finished fabric was used for development of UV Protective scarf masks for farm women. Developed scarf masks were assessed for their suitability by farm women for which field testing was carried out in Lamjala village. Total thirty women who used to work on fields regularly were selected and given the UV protective scarf masks. Results of the survey explained that the farm women found the scarf very useful and effective against the harmful effects of sun rays.

Field Testing of UV Protective Scarves

UV protective scarves were tested on the fields with. Field testing was carried out in the lamjala village of Nainital district with the members of KVK Jyolikot, Nainital. Total ten women who used work on fields on regularly was selected, and given the UV protective scarves.

Distribution of scarf mask among farm women

Total 30 scarf mask were developed and given to the farm women of Lamjala village to evaluate the effectiveness of mask. Results of the survey explained that the farm women found the scarf very using useful and effective against the harmful effects of sun rays

Potential of commercialization

The developed technology has great potential of commercialization. AICRP- CT has received an order for sixty scarf mask from KVK Kashipur (US Nagar, Uttarakhand) and KVK Jyolicot (Nainital, Uttarakhand).

Advantage

The scarf mask is treated with *jamun* leaves which is having UV Protective properties. Along with this the design features of scarf masks also provided protection to head and face from sun as well as protection from dust, dirt and other allergens while working in fields.

Technology impact

Farm women are using the scarf mask regularly while on fields and reported reduction in health problems arises due to the direct exposure to sun and dust. It also helped in mitigating occupational health hazard of farm women.

The developed scarf masks were also found useful by them for protection during covid-19 situation. Developed technology is helpful in utilization of local and renewable plant sources for UV protective finish.

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Research Story

Nettle fibre extraction

Dr. Manisha Gahlot Professor, Clothing and Textiles in Home Science is working in collaboration with Uttarakhand Bamboo and Fiber Development Board, Dehradun in the project entitled “Himalayan nettle processing and standardization”.

Research story

The Indian Himalayan Region (IHR) with diverse bio-geographic and eco-climatic features, is known for richness of bio-physical resources and its indigenous cultural groups, which live in harmony with their natural surroundings. The unique practices of resource use and management developed by these groups, over time, have ensured long term sustenance of natural resources. Among others, products of plant-based fibres form such an example of judicious use of natural resources for meeting the needs, while having limited access to alternative material. The combination of strength with flexibility, inherent in many of the natural fibres, had attracted the attention of people for long. The fibre production contributes significantly to the economy of the region in various ways, including agriculture, clothing and products for other household operations.

In the hilly region, fibre-based products constitute a key component of village culture, even though providing very limited income-generation opportunities to local inhabitants or artisans. However, considering that plant based natural fibre products are of high quality and durability, these products have the potential for promoting income generating cottage industries, which may support livelihood of a large number of indigenous people.

Complete description of technology

For the current research work dry ribbons of different harvesting time periods i.e. 15-25 November, 15-30 November, 1-14 December and 17-30 December were used, which were collected from Uttarakhand Bamboo and Fiber Development Board for extraction and processing. Different chemicals (sodium hydroxide, sodium chlorite, acetic acid) were used for retting and processing of Himalayan nettle fibres. Carding process was done for proper opening and parallization of fibres with the help of hand combing brushes. Trial experiments were conducted in lab with small quantity of fibres for optimization of process. After successful trial experiments, fibres were evaluated for their physical, mechanical and aesthetic properties. On the basis of these evaluation fibres of December 1-14 time period were found suitable for further.

processing. Bulk processing was conducted so that technology can be transferred from lab to land in a easy way.

Chemical treatment

Sodium chlorite, acetic acid and sodium hydroxide combination were selected for extraction of Himalayan nettle fibre from ribbons (1-14 December).

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Research Story

The method followed for chemical treatment is as follows:

Steps for Chemical treatment

Step - 1 Nettle ribbons were soaked in water for two days and then rinsed with tap water to remove foreign particles and dust.

Step - 2 The cleaned ribbons were then boiled in NaOH (1%) solution containing 1:15 M:L ratio for one hour.

Step - 3 After that fibres were washed and beating was done to remove upper bark.

Step - 4 Washed fibres were treated with acetic acid (6% o.w.f) and sodium chlorite (6% o.w.f) half hour.

Step - 5 The obtained fibres thoroughly washed in running tap water.

Step - 6 Finally the obtained fibers were dried under shade and the fibers were extracted manually with the help of combs.

Brief description of technology including salient features:

Extraction and processing of Himalayan nettle fibre with minimal use of chemicals.

Value addition of Himalayan nettle fibre



Benefits/utility:

Locally and abundantly available plant source is utilized.

This could be an additional source of income to the local people.

Technology social impact:

Income generation activity can be taken up at small-scale level that may help in livelihood generation of local community.

Pantvarsity in News

सीधी बुआई विधि से धान उत्पादन में बढ़त



पंतनगर में सीधी बुआई विधि से तैयार धान की फसल का जायजा लेते कुलपति डॉ. तेज प्रताप।

संबाद न्यूज एजेंसी

पंतनगर। पंतनगर विधि के वैज्ञानिकों ने धान की सीधी बुआई को प्राथमिकता देकर 40 हेक्टेयर क्षेत्र में बेहतर उत्पादन कर, किसानों को न्यूनतम श्रम और कम लागत में बेहतर धान उत्पादन का रास्ता सुझाया है। शनिवार को विधि के वैज्ञानिकों ने धान की सीधी बुआई को प्राथमिकता देकर 40 हेक्टेयर क्षेत्र में बेहतर उत्पादन कर, किसानों को न्यूनतम श्रम और कम लागत में बेहतर धान उत्पादन का रास्ता सुझाया है। शनिवार को विधि के वैज्ञानिकों ने धान की सीधी बुआई को प्राथमिकता देकर 40 हेक्टेयर क्षेत्र में बेहतर उत्पादन कर, किसानों को न्यूनतम श्रम और कम लागत में बेहतर धान उत्पादन का रास्ता सुझाया है।

कुलपति ने कहा कि धान की सीधी बुआई में खरपतवारों की सघनता ज्यादा होती है, जिससे शाकनाशियों का प्रयोग कर आसानी से निजात पाई जा सकती है। सीधी बुआई में न तो नर्सरी, न कटौट और रोपाई की भी आवश्यकता नहीं

न्यूनतम श्रम और लागत में बेहतर उत्पादन, कुलपति ने वैज्ञानिकों को सलाह

पड़ती है। इस विधि में गेहूं की तरह ही खेत तैयार कर कुछ ही समय में बड़े क्षेत्र की बुआई की जा सकती है। यही नहीं सीधी बुआई करने में 25 से 30 प्रतिशत कम पानी का उपयोग होता है। इससे कम श्रमिक, डीजल और पानी के साथ अच्छा उत्पादन प्राप्त हो जाता है। इस तकनीक को अपनाकर जहाँ प्राकृतिक संसाधनों के दोहन से छुटकारा मिलेगा, वहीं देश की खेती टिकाऊ बनी रहेगी।

वहाँ निदेशक शोध डॉ. एस. नैन, केंद्र के संयुक्त निदेशक डॉ. वीपी सिंह, सीजीएम फार्म डॉ. डीके सिंह, डॉ. आरपी मोर्य, केंद्र के सह निदेशक डॉ. एसपी सिंह, डॉ. अवनीश कुमार, समीर चतुर्वेदी आदि मौजूद थे।

अमर उजाला

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सुपर सीडर से रोका जा सकता है पराली से होने वाला प्रदूषण धान की फसल काटने के साथ ही पराली नष्ट करने और गेहूं बुवाई में भी होगी मददगार

अमर उजाला ब्यूरो

काशीपुर। धान की फसल काटने के बाद उसकी पराली के धुरों से होने वाले वायु प्रदूषण से अब निजात मिलने के आसार हैं। पराली की समस्या से छुटकारा पाने के लिए पंजाब में सुपर सीडर मशीन का आधिकारिक किया गया है। उपभोक्ता नगर में भी इसका इस्तेमाल करने के लिए कृषि विभाग के वैज्ञानिक किसानों को जागरूक कर रहे हैं। इससे पराली को जलाने की जरूरत नहीं होगी और खेतों की उर्वरा शक्ति भी प्रभावित नहीं होगी।

हरिद्वार के बाद उपभोक्ता नगर जिले के सुपर सीडर मशीन का आधिकारिक किया गया है। धान की फसल काटने के बाद उसकी पराली को नष्ट करने के लिए किसान उसे खेतों में ही जला देते हैं। इससे वायु प्रदूषण बढ़ने के साथ ही धूम्र को उर्वरा शक्ति भी कम होती है। पंजाब और हरियाणा में पराली से होने वाले वायु प्रदूषण को नियंत्रित करने के लिए इन प्रांतों के अधिकार किसान अब सुपरसीडर मशीन का प्रयोग कर रहे हैं। सुपर सीडर से गेहूं, ज्वार, गन्ना और

फरटीसोड ड्रिल लगा होता है जो धान की पराली को काट कर मिट्टी में मिला देता है। साथ ही कुछ बनावट हुए खाद और बीज को बुवाई कर इसे मिट्टी से ढक देता है। बीज दो से तीन इंच गहराई में बोया जाता है। मुख्य लक्ष्य यह है कि धान की पराली मिट्टी में अच्छी प्रकार से मिश्रित होकर खाद बन जाती है। इसके साथ-साथ खेती की लागत में लगभग 50 से 60 प्रतिशत की कमी आ जाती है। इस विधि से गेहूं की बुवाई करने पर उत्पादन में भी थोड़ी कमी नहीं आती है। कृषि विभाग के डी.एस.एस. के



सुपर सीडर मशीन।

वैज्ञानिक भी किसानों को इस मशीन से बुवाई करने के लिए प्रेरित कर रहे हैं। उपलब्ध के लिए कुछ मशीनें के बावजूद पराली नष्ट करने और गेहूं की बुवाई का काम एक साथ कर सकते हैं। उपभोक्ता नगर में इसका इस्तेमाल करने के लिए किसानों को जागरूक किया जा रहा है। इससे पर्यावरण संरक्षण में मदद मिलेगी। किसानों को भी अधिक लाभ होगा।



पंजाब में पराली की समस्या अधिक होने के कारण यहां सुपरसीडर मशीन का आधिकारिक किया गया है। यह एक बहुउद्देशीय उपकरण है जो धान काटने के साथ ही पराली नष्ट करने और गेहूं की बुवाई का काम एक साथ कर सकते हैं। उपभोक्ता नगर में इसका इस्तेमाल करने के लिए किसानों को जागरूक किया जा रहा है। इससे पर्यावरण संरक्षण में मदद मिलेगी। किसानों को भी अधिक लाभ होगा।

डॉ. जितेंद्र कल्ला, प्रभारी कृषि विभाग, नैनताल।

पंतनगर में 33 लाख की परियोजना को मिली मंजूरी

संबाद न्यूज एजेंसी

पंतनगर। जीवो पंत कृषि एवं प्रौद्योगिकी विभाग के सेवायोजन एवं परामर्श निदेशालय में विधि के अनुसूचित जाति के विद्यार्थियों के लिए 14 सितंबर से चार महीने के लिए उद्यमिता विकास पर प्रशिक्षण और कोचिंग कार्यक्रम का आयोजन किया जा रहा है। इसका उद्देश्य पढ़ाई पूरी करने के बाद युवाओं में स्वरोजगार के प्रति विश्वास विकसित करना है। इसके लिए भारतीय कृषि अनुसंधान परिषद (आईसीआर) ने पंतनगर विधि की 33 लाख रुपये की परियोजना मंजूरी की है। बुधवार को

14 सितंबर से उद्यमिता विकास कार्यक्रम होगा शुरू

अभिषेक सोबीयम एवं निदेशक सेवायोजन डॉ. आरएस जादौन ने बताया कि कोविड-19 के चलते युवाओं की नौकरियां चली गई हैं। भारत सरकार की ओर से एससी के युवाओं में इंटरनेट-युगीन विकास करने के लिए प्रशिक्षण और कोचिंग प्रोग्राम शुरू किए जा रहे हैं जिससे युवा नौकरी, मोपेन वाले न बनकर नौकरी देने वाले बन सकें। प्रशिक्षण कार्यक्रम का आयोजन ऑनलाइन किया जाएगा और विद्यार्थियों को प्रमाण पत्र दिए जाएंगे। हर महाविद्यालय से अर्जित प्रत्यावेदनों के आधार

पर पांच समन्वयकों का चयन किया गया है। समन्वयकों ने उनके महाविद्यालयों में अध्ययनरत अनुसूचित जाति के लगभग 500 विद्यार्थियों को वादनाम पर बुलाकर जोड़ लिया है। कृषि महाविद्यालय से डॉ. ओमवीर सिंह, परतु विज्ञान महाविद्यालय से डॉ. एसपी सिंह व डॉ. निरंजना पंत, गृह विज्ञान महाविद्यालय से डॉ. सोना कल्ला, प्रौद्योगिकी महाविद्यालय से डॉ. पारस व डॉ. सुनील सिंह तथा मत्स्य विज्ञान, विज्ञान एवं मानविकी और कृषि व्यवसाय प्रबंधन महाविद्यालय से डॉ. अतुल कुमार इन प्रशिक्षण कार्यक्रमों का आयोजन करेंगे।

पंत विधि के सेवायोजन परामर्श निदेशालय ने तैयार किया उद्यमिता कार्यक्रम छात्रों को उद्यमी बनाने को प्लान तैयार

अतिरिक्त कुलपति डॉ. पंतनगर

विधि के बाद छात्र नौकरी करने की जगह स्वरोजगार के माध्यम से नौकरी देने वाला बनें। इसके लिए परामर्श निदेशालय पंत कृषि एवं विधि के सेवायोजन परामर्श निदेशालय ने तैयार प्लान तैयार किया है। जिसमें ऑनलाइन के माध्यम से उद्योग सम्पत्ति से सफल होने के गुर बचाए जाएंगे। उद्योग को सफलता के लिए दखल व रचित वेबद जल्दी है। हरित क्रांति की जन्म स्थली विधि से पढ़ाई कर छात्र देश-दुनिया में नुकसि विदेशों में योगदान देकर विधि का नाम रोशन कर रहे हैं।

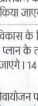
कोरोना संक्रमण को यज्ञ से मशालें प्रजाली अपने वतन आए तो उनके सामने खासकर पर्यटन जिलों में रोजगार की समस्या खड़ी हो गई। कोरोना काल में जानी मानी कंपनियां भी प्लेसिड के लिए कम रकम देकर नती है जो विधि का विषय है। जब कृषि आधारित लोग उद्योग खड़ा करवा देंगे तो कृषि में विधि के छात्रों को उद्योग शुरू करने से लक्ष्य सफल होने तक के टिप्स दिए जाएंगे। उद्योग के प्रबंधन, मार्केटिंग, आर्थिक और को गहनता से जानकारी दी

व्या है 60 लेसन प्लान छात्रों को उनकी रुचि के हिसाब से ऑनलाइन 60 कक्षाएं संचालित होगी। इसके लिए देश के जाने माने अलग-अलग एक्सपर्ट होंगे। जैसे उद्यमी की शक्ति होगी। उद्योग की पहचान, फायदा, नुकसान, निवेश, उद्योग शुरू करने, मार्केटिंग, वित्तियन, आर्थिक, निवेश के तहत भवन का निर्माण, उद्योग चलावने की प्रक्रिया, प्रबंधन, सामान और पर क्वालिटीय हो जाती है, उद्योग सफलता की अनुभूति, टैक्स रीमिटेडेशन, इंटरनेटवेबसाइट आदि के बारे में छात्रों को बताया जाएगा।

एससी जाति के छात्रों को उद्यमिता विकास के लिए इंटरनेटवेबसाइट संचालित होगी। लेसन प्लान के तहत इंटरनेटवेबसाइट संचालित होगी। 14 सितंबर से ऑनलाइन ट्रेनिंग दी जाएगी। मेमोरता से लिया। साथ ही यह कदम अनुसूचित जाति सह प्लान के तहत उद्योगों में। योजना में 30 लाख रुपये मिलेंगे हैं। एससी छात्रों को उद्यमी बनाने की 60 लेसन प्लान बनाया गया। इसमें लेख के विषय से छात्रों को उद्योग शुरू करने से लक्ष्य सफल होने तक के टिप्स दिए जाएंगे। उद्योग के प्रबंधन, मार्केटिंग, आर्थिक और को गहनता से जानकारी दी

समन्वयकों का चयन कार्यक्रम को सफल बनाने के लिए पांच समन्वयकों का चयन किया गया है। कृषि महाविद्यालय के डॉ. ओमवीर सिंह, परतु विज्ञान महाविद्यालय के डॉ. एसपी सिंह व डॉ. निरंजना पंत, गृह विज्ञान महाविद्यालय के डॉ. सोना कल्ला, प्रौद्योगिकी महाविद्यालय के डॉ. पारस व डॉ. सुनील सिंह और मत्स्य विज्ञान, विज्ञान एवं मानविकी और कृषि व्यवसाय प्रबंधन महाविद्यालय के डॉ. अतुल कुमार इन प्रशिक्षण कार्यक्रमों का आयोजन किया जाएगा।

उद्यमिता विकास कार्यक्रम 14 सितंबर भारतीय कृषि अनुसंधान परिषद के सहयोग से शुरू हो रहा है। योजना में करीब 500 विद्यार्थी हिस्सा लेंगे। गोपाला जीवोटी सिंह अवरुद्धिटेड ईकेस्ट्रेट के उपाध्यक्ष जीवो वतन कोटि देव के डॉ. एसपी सिंह उद्यमिता विकास के बारे में कहा। सफल उद्यमिता कार्यक्रमों के प्रभावशाली करेंगे।



डॉ. आरएस जादौन, निदेशक, सेवायोजन परामर्श निदेशालय, पंत विधि

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