CROP AND WEED SCIENCE NEWS

Published by Crop and Weed Science Society, Department of Agronomy, Faculty of Agriculture, Bidhan Chandra Krishi Viswavidyalaya, Mohanpur-741252, Nadia, West Bengal, India

www.cwssbckv.org.in

2009

CWSS activities

- Publication of Biannual (two issues annum^{-1}) Journal Crop and Weed, and annual (one issue annum^{-1}) Crop and Weed Science News since 2005 on regular basis.
- Second Biennial Conference of the CWSS and two days Training Programme on, "Best Management Practices of Agricultural Inputs" at FTC (Lake Hall), Kalyani , BCKV on 21-22 May, 2008.
- "First Invasive Weeds Awareness Programme" was organized by NIWS, DAC, GOI through NRCWS, ICAR, BCKV Centre in collaboration with Crop and Weed Science Society (CWSS), BCKV and Chandamari Sannidhya Rural Welfare Society (CSRWS), Kalyani at Satimata Mandir Prangan, Kalyani, Nadia on 3 March, 2009. Five farmers were awarded.

- Training programme on System of Intensification (SI) at Village Chandamari, Nadia on 2 May, 2009 to establish a MODEL VILLAGE on SI. This MODEL VILLAGE work has been started from 2008.
- National Symposium on "Agriculture in the Paradigm of Intergenerational Equity" on the occasion of 5th Annual Conference of CWSS scheduled to be held at FTC (Lake Hall), BCKV on 22- 23 May, 2009.

ICRISAT develops method to grow sugarcane with less water

Scientists at the International Crops Research Institute for the Semi-Arid Tropics (ICRISAT) and World Wide Fund (WWF) for Nature have joined hands to develop Sustainable Sugarcane Initiative (SSI), that will take the sugarcane industry to drip method for cultivating the water-intensive crop, reducing input costs and also to get higher yield. According to a report, agricultural scientists have taken a cue from the SRI (System of Rice

Contd. to Page : 2

Lotus Foods introducing SRI – The Healthiest Rice for People & Planet

1. **Indonesian Volcano Rice :** A nutrient-dense brown and red rice with high mineral, fibre, magnesium, manganese and zinc content; cooks in only 30 minutes.
2. **Madagascar Pink Rice :** The rice with its delicious tropical spice taste and abundant growth; cooks in only 25 minutes.
3. **Cambodian Mekong Flower Rice :** The rice with delicate floral aroma, highest nutritional value, the germ and bran layer intact intensifying its fragrance and nutty flavor; cooks in only 30 minutes.

*Materials intended for publication in the News Letter may please be submitted to the Editor, **Prof. A. P. Patra**, Deptt. of Agronomy, BCKV, Mohanpur, Nadia, W.B., India.*

Editors column

Rising trend of short but intense spells of rainfall is making usable water scarce in India : It is happening repeatedly all over the country. Farmers do not know why. Nor do they know how to tide over the crop-destroying downpours. Scientists and meteorologists have an answer to the first question. The root cause is global warming, they argue. In 1997, K J Henessey, scientist at the Australia-based Commonwealth Scientific and Industrial Research Organization, used mathematical calculations and empirical evidence to predict climate warming would cause intense rainfall and increase risk of floods. It proved true for India. The Centre for Mathematical Modelling and Computer Simulation, Bengalooru, in its report in March 2007, showed dry areas, like south Gujarat, north Madhya Pradesh and south Orissa, were also receiving extreme rainfall. So were the semi-arid regions of north India. A study found a strong statistical correlation between rise in sea temperatures due to global warming and increase in incidence of extreme rainfall. M. Rajeevan of National Atmospheric Research Laboratory looked at sea surface temperature of the past 104 years. He noticed sea surface temperature and extreme rainfall events followed a similar, increasing pattern.

Increase in average wind speed over the sea surface too has contributed to temperature increase. The wind carries away the water vapour and creates space for more vapour. When this vapour condenses and falls as raindrops, the heat trapped within is released and warms the air close to the earth's surface, which has a compound effect leading to more vaporization. This increased windspeed with high moisture causes storms and depressions.

This declining trend of overall moderate rainfall is attributed to southwest monsoon winds bypassing India. The number of days of more than 12 mm rainfall have decreased by 78% in the last 53 years. Active monsoon periods are created when the lower jet stream, the moisture-laden wind from the Arabian Sea and the Indian Ocean passes through India. When these winds bypass the peninsula and flow south of it, there are breaks in the monsoon. These breaks are increasing and active monsoon periods are decreasing. This is bad news for farmers who rely heavily on monsoons.

High extreme rainfall combined with decreasing monsoons is making rainfall more unpredictable. Lack of uniformity in temperature increase in different regions of the country could be making it more so.

Contd. to Page : 3

SPLCV CP gene of China isolate (DQ512731.1), which indicate SPLCV CP gene is conserved. Complete DNA sequencing of SPLCV is under progress.

Begomovirus infecting the weeds Ageratum yellow Vein Virus, Croton Yellow Vein Virus, Zatropha Yellow Mosaic Virus has been identified using gene specific primers (SPG1/SPG2). The SPLCV BCKV isolate revealed sequence similarities of 67-71% between Agaratum yellow Vein Virus and Tomato Leaf Curl Virus indicating SPLCV to be distinct species. The infection of leaf curl virus in Tomato, Chilli, French bean and Papaya was confirmed by PCR-based method.

Sweetpotato Feathery Mottle potyvirus (SPFMV) has been detected by RT-PCR. Molecular cloning and sequencing of CP gene of SPFMV is under progress; the preliminary results reveal the existence of China isolate of SPFMV in the field collected samples.[Jayanta Tarafdar, Monoj Kumar, Amrita Banerjee and Somnath Roy, Directorate of Research, BCKV, Kalyani: jayanta.tcbckv@gmail.com, Jayanta_bckv@yahoo.co.in]

Bayer launches disease resistant rice

Bayer Crop Science has announced the launch of Arize Dhani, a bacterial leaf blight (BLB) disease-resistant hybrid rice variety, which can also increase yield by 20-30% compared to ordinary varieties. The company now markets seven rice varieties in India.[Visit: http://www.bayercropscience.com/bayer/cropscience/cscms.nsf/id/20080514_EN?open&ccm=400]

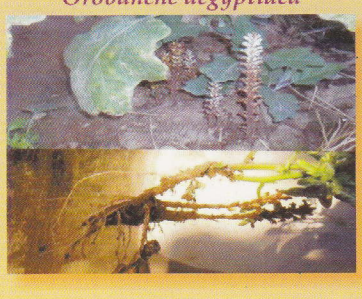
VIB researchers convert annuals to perennials

Scientists at the Flanders Institute of Biotechnology (VIB) and Ghent University successfully converted annual plants to perennials by silencing two genes. The VIB researchers deactivated a pair of flower inducing genes in the model plant *Arabidopsis*, a typical annual. These genes are normally activated in the advent of long days in the spring. Mutant plants can no longer induce flowering, but they can continue to grow vegetatively or come into flower much later. As with real perennials, these plants show secondary growth with wood formation creating shrub-like *Arabidopsis* plants. The scientists noted that the silencing of these genes might be an important mechanism in plant evolution, initiating the formation of trees. [http://www.vib. be/NR/rdonlyres/E8FB2BC8-3D32-4D76-BFC1-9609FA07C689/ 2762/20081107_ENG_Beeckman_bloeiinductie_web.pdf]

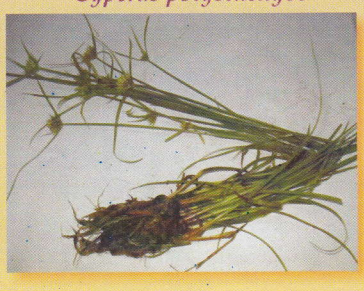
Identification of parasitic weed in West Bengal

Orobanche aegyptiaca in Brinjal in the field of Thakurdas Mudi at Vill. Khairipihira, Purulia, and *Cyperus polystachyos* at Nadia, West Bengal, were identified by Dr. R. K. Ghosh, Deptt. of Agronomy, BCKV, Area Coordinator, NIWS, DAC, Govt. of India & P.I. AICRP-WC, NRCWS, ICAR. *Orobanche aegyptiaca* was also reported by Prof. A. P. Patra, Deptt. of Agronomy, BCKV to be found in Brinjal in Vill. Radhanagar, Bankura in 1950's, but was not identified with this name at that time.

Orobanche aegyptiaca



Cyperus polystachyos



Conferring degree

Seventeenth Convocation of Bidhan Chandra Krishi Viswavidyalaya : Seventeenth Convocation of Bidhan Chandra Krishi Viswavidyalaya was held on April 9, 2009. Hon'ble Chancellor Sri Gopal Krishna Gandhi, Governor of West Bengal presided over the Convocation. Dr. M. S. Swaminathan, Member of Parliament (Rajya Sabha) and Chairman, M. S. Swaminathan Research Foundation, Chennai graced the occasion as a Chief Guest.

The Viswavidyalaya awarded Ph.D. degree in Agriculture and Horticulture to 44 and 7 students, M.Sc. (Ag.) and M.Sc. (Hort.) degrees to 100 and 25 students, B.Sc. (Ag.) Hons. and B.Sc. (Hort.) Hons. and B.Tech (Ag. Engineering) Hons. degrees to 82, 16 and 16 students, respectively. Twelve University Gold Medals and 7 Endowment Medals were awarded to the students for M.Sc. (Ag.), M.Sc. (Hort.), and B.Sc. (Ag.) Hons., B.Sc. (Hort.) Hons. and B.Tech. (Ag. Engineering) Hons. Examinations. Twelve Merit Certificates were awarded to the students for M.Sc. (Ag.), M.Sc. (Hort.), B.Sc. (Ag.) Hons., B.Sc. (Hort.) Hons. and B.Tech. (Ag. Engineering) Hons. Examinations. Two Book Prizes were awarded to the students for M.Sc. (Ag.) and B.Sc. (Hort.) Examinations. Three Certificate of Honour were awarded to Smt. Sandhya Bag, Sri Joydeb Kumar Ghosh and Sri Radha Krishna Karmakar. Two D.Sc. (*Honoris Causa*) were awarded to Dr. Sisir Kumar Mukhopadhyay and Dr. Abhijit Sen.

Researchers identify gene that regulates rice yield potential

Researchers from Huazhong Agricultural University in China have pinpointed a gene that plays a linchpin role in determining yield potential in rice, as well as the plant's adaptability to cooler climates. Their study, published by the journal Nature Genetics, has implications for rice productivity.

The researchers found out that deletion of the *Ghd7* gene results to plants that are shorter and have fewer grains per panicle. There are five different versions of *Ghd7*. Less active, or inactive, versions of Ghd7 were found in rice grown in temperate regions. This enables rice to be cultivated in areas where there is a short growing season. [http://www.nature.com/ng/journal/vaop/ncurrent/abs/ng.143.html].

Published by Secretary, **Crop and Weed Science Society**, Deptt. of Agronomy, BCKV, Mohanpur, Nadia, W.B., India.
Printed by : **A. M. Computer Prints**, B-17/81, Kalyani, Nadia, W.B.
Mob : 9433135357 / 9433619672

ICRISAT develops method *Contd. from Page : 1*

Intensification) as it consumes less water, yields more and applies the vital principles to the sugar industry. The method is expected to increase yields by 20%, reduce water consumption by30% and chemical inputs by 25%. [Visit: http:// www.fnbnews.com/article/detnews.asp?articleid=25362&sectionid=1].

Information of interest

Introduction of the system of rice intensification : The System of Rice Intensification technique is promoted under World Bank assisted project Irrigated Agriculture Modernized Water Bodies Restoration and Management (IAMWARM) in Tamil Nadu. During 2007-08, 912 demonstrations at the cost of Rs. 36.48 lakhs were organized. In 2008-09, a sum of Rs. 122.04 lakhs was spent for conducting 2034 demonstrations.

The popularization and promotion of SRI through demonstrations at farmers' field is one of the important interventions of National Food Security Mission-Rice (NFSM-Rice), which is in operation since October, 2007 in 136 districts of 14 States (Andhra Pradesh, Assam, Bihar, Chhattisgarh, Gujarat, Jharkhand, Karnataka, Kerala, Madhya Pradesh, Maharashtra, Orissa, Tamilnadu, Uttar Pradesh and West Bengal) in the country. Besides, the similar intervention is also implemented in Integrated Cereal Development Programme in Rice Based Cropping System Area (ICDP-Rice) in non-NFSM districts and States under Macro-Management Programme. [This information was given by Shri Kanti Lal Bhuria, Minister of State for Agriculture in a written reply to a question in the Rajya Sabha]

NABARD fund to help farmers access appropriate technologies : NABARD has set up a 'Farmers Technology Transfer Fund' (FTTF), with a corpus of Rs. 25 crore from out of its operating profit for the year 2007-08 to help farmers in accessing appropriate technologies for improved and increased productivity. K.V.Raghavulu, Chief General Manager, National Bank for Agriculture and Rural Development, said the fund would also be utilised for transfer of technologies by State Agriculture Departments, Krishi Vigyan Kendras, and State Agriculture Universities.

National Food Security Mission In West Bengal : The National Food Security Mission (NFSM) is in operation in 17 states of the country including West Bengal. National Food Security Mission-Rice (NFSM-Rice), National Food Security Mission-Wheat (NFSM-Wheat) and National Food Security Mission Pulses (NFSM-Pulses) are being implemented in the state. A total number of 13 districts have been identified for the implementation of NFSM in the State as under:

NFSM-Rice : 24 Paragnas (South), Cooch-Behar, Dinajpur (North), Howrah, Jalpaiguri, Midnapur (East), Midnapur (West) and Purulia.

NFSM-Wheat : Cooch-Behar, Dinajpur (North), Dinajpur (South) and Jalpaiguri.

NFSM-Pulses : Birbhum, Malda, Murshidabad, Nadia and Purulia.

Methane emission from rice field

Methane emission from two different rice ecosystems (*Ahu* and *Sali*) at Lower Brahmaputra Valley Zone of North East India : The estimation of methane emission has been made with rice varieties viz., Ranjit and Mahsuri, grown under two different agro-ecosystems at Lower Brahmaputra Valley Zone of Assam with sandy to sandy loam type of soil. Variety 'Ranjit', grown at monsoon (*Sali*) rice ecosystem at lowland rainfed condition, showed higher seasonal integrated methane flux value compared to variety 'Mahsuri', grown at pre monsoon (*Ahu*) rice ecosystem. Both varieties showed two methane peaks, one at the active tillering stage and the second at the reproductive stage of the crop. The observed variation in methane emission peaks are contributed mainly by physiological characteristics of the rice plant such as leaf numbers, tiller numbers, plant height, root shoot biomass and leaf area index, which are correlated with methane emission and governed by plant genotypes and environment during the growing season. Methane emission is less from upland rainfed rice ecosystem than low land one, and this ecosystem can be considered a suitable option for biological mitigation of methane from rice paddies. [N. Gogoi, K. Baruah, B. Gogoi and P. K. Gupta, Dept. of Environmental Science, Tezpur University, Tezpur 784028, Assam, India]

Projects

1. Multi-institutional project on 'Generation of virus-resistant rice for India: Diversifying transgenic resistance to popular varieties against tungro disease' funded by DBT, Govt. of India under Dr. Jayanta Tarafdar, Department of Plant Pathology, BCKV.

The Basmati 1 carrying (PB-1[Ods-2]) gene against RTBV has been incorporated in *Shatabdi* and *Khitish*. F-1 lines showed positive to transgene detection; PCR and other molecular analysis of F-2 and Back Cross lines are in progress.

The sequence analysis of coat protein gene of Rice Tungro Bacilliform DNA Virus and Rice Tungro Spherical RNA Virus show maximum (98%) identity with the strains last characterized several years back, which indicates both the particles are much conserved in West Bengal. [Jayanta.tcbckv @gmail.com, Jayanta_bckv@yahoo.co.in]

2. A Technology Development, Training and Extension (TDET) ad-hoc project on "Demonstration, extension and training of water management technology (TOT) for productivity improvement and economic sustainability of aqua-terrestrial farming system on wastelands under humid areas of West Bengal" funded by the Govt. of India under Dr. A. M. Puste, Department of Agronomy is running since September 2007, with the aim of the development of waste or unused wetlands through need-based cleaning, excavation, renovation works and adaptation of valuable aquatic crops integrated with fish cultures vegetables and tree plantations under aqua-terrestrial ecosystem at the farmer's field.

Tobacco-produced hormone protects kidney cells from damage

Eythropoietin (EPO) is a glycoprotein hormone that controls red blood cell production. EPO acts as a general tissue-protective agent that has the potential to treat numerous diseases and injuries, including stroke, myocardial infraction and spinal cord injury. It is also involved in the brain's response to neuronal damage and in wound healing.

Recombinant EPO is an important biopharmaceutical that is used extensively in anemia caused by kidney failure, chemotherapy and AIDS. Unfortunately, cell cultures are unlikely to meet the anticipated market demands for EPO because of high production costs. The use of plants as expression systems may address these limitations to enable practical, cost-effective delivery of EPO in tissue injury prevention therapeutics.

A team of researchers from Canada developed transgenic tobacco plants accumulating high levels of EPO (up to 0.05% of total soluble protein in leaves). The scientists found that higher accumulation levels of EPO can be achieved in the endoplasmic reticulum than in the apoplast or chloroplasts. More importantly, the team also demonstrated that plant-derived EPO had enhanced receptor-binding affinity and was able to protect kidney epithelial cells from cytokine-induced death *in vitro*. The tobacco-produced EPO does not possess the potentially harmful side-effects associated with excessive haematopoietic activity. [http://dx.doi.org/10.1111/j.1467-7652.2008.00389.x]

Past events :

- Fourth World Congress on "Conservation Agriculture : Innovations for Improving Efficiency, Equity and Environment" on 4-7 February, 2009 at New Delhi, India.
- Sixth Global Knowledge Millennium Summit "Bio-Nano: The War on Hunger" was held on 12-14 February, 2009 in New Delhi, India, organized by the Associated Chambers of Commerce and Industry (ASSOCHAM) of India for discussing and providing technological solutions for a hunger free world [http://www.assocham.org/ 6thbionano2008].
- International Conference on "Quality seed and food security" at Bangladesh Agricultural University, Mymensingh on 17-19 February, 2009 [E-mail: gmmrbau @yahoo.com].
- Seminar on Edible Oilseeds and Oils at Kolkata on February, 2009.
- IOPEA-EPC seminar at Kolkata on Sunday, 8 March, 2009 at Paladian Hall.

Future events

- International Conference on Promising Practices for the Development of Sustainable Paddy Fields at Bogor, Indonesia on 7-9 October, 2009, organised by the International Society of Paddy and Water Environment Engineering (PAWEES) and co-organised by the Deptt. of Civil and Environmental Engineering of Bogor Agricultural University, Indonesia. Abstract submission by 31 June, 2009; Full paper submission by 31 August, 2009; Registration by 7 September, 2009. [mail to pawees 2009@ipb.ac.id and cc to pawees2009@gmail.com]
- The IRRI will celebrate and launch its 50th anniversary on 17 November, 2009 at IRRI, Los Baños, Philippines. The 6th International Rice Genetics Symposium in Manila will be held on that same month. The 3rd International Rice Congress is set to be held in Hanoi, Vietnam in November, 2010. [Email Sophie Clayton for details of the anniversary activities at s.clayton@cgiar.org.]

New system of wheat-rice intensification

The China Academy of Agricultural Sciences (CAAS), Institute for Agroecology and Farming Systems, is adapting SRI concepts and methods to improve productivity of the wheat-rice rotational farming system which is very important in China and also South Asia, covering 22 million hectares in these two regions. China's current average wheat and rice yields in a year's cycle is usually about 10 t/ha of grain. Whereas, with "the System of Wheat-Rice Intensification' or SWRI, annual combined yields of 13, 15 and 17 t/ha have been achieved in different locations in Jiangsu province. This opens up new opportunities for SRI use as SWRI's shortening of the rice crop cycle is advantageous for the accompanying wheat crop grown in rotation, permitting earlier planting, plus giving more rice yield. SRI aerobic soil conditions benefit the wheat crop, which is not well adapted for anaerobic soils. [sririce@ cornell.edu]

Editors column *Contd. from Page : 1*

It has been reported that winters in northern India are warming faster than in southern India. Temperature data of 102 years have been compiled to prove significant variations in temperature increase in different regions. The minimum temperature (recorded during night) in winter in the northern part of the country increased 0.7°C, while in the south it increased only 0.3°C in 102 years.

Warmer winters and hotter summers are bad news, but sea temperature trends bring worse tidings. In the last century, surface temperature of the Bay of Bengal and the Arabian Sea increased 0.8°C, which is 50 per cent higher than global average rise in sea surface temperature. This could make weather more unpredictable in India.

The effect of rising temperatures can be seen on the Himalayan glaciers. They have thinned considerably. Larger glaciers numbering 466 shrunk 21% between 1962 and 2001, and 127 smaller glaciers 38%. This reduction in glacial cover in turn has affected the flow of rivers. Many Himalayan rivers have less waterflow throughout the year including monsoon. But they flood villages and towns more frequently when there is intense rainfall.

Rise in temperature dries up the soil and increases water requirement of crops, and water from extreme rainfall is of little help. So, farmers now depend more on irrigation and groundwater.

Initial increase of CO_2 levels enhances photosynthesis and crops grow fast. But the temperature increase due to higher CO_2 level stalls growth of plants.

In Raipur district of Chhattisgarh, the peak rainfall period has shifted from July to August, and farmers have been asked to change their crop cycle and delay sowing. Scientists offer some solutions to the farmers like changing the crop variety depending on prevailing conditions. While scientists seek answers in weather patterns, the government urgently needs to change its agricultural policy to deal with acute shortage of usable water for farmers' field.

Molecular detection and characterization viruses infecting crop plants and weeds in West Bengal a new challenge

The coat protein (CP) gene of the genomic DNA of Sweetpotato Leaf Curl Gemini Virus (SPLCV) was cloned and their nucleotide sequences were determined. Sequence comparisons of the BCKV isolate (gene bank accession No. EU650183) showed 94.0% amino acid identity in the Coat Protein gene of Sweetpotato Leaf Curl Virus (EF151926.1), 92% identity of

For membership of the society please contact Secretary, Crop & Weed Science Society, Deptt. of Agronomy, BCKV, Mohanpur, Nadia, West Bengal, India.