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Together we will protect our crops

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News in Brief

From the Editors' Desk :

● Potato is a major financial crop for farmers in most districts of West Bengal, primarily Hooghly, Burdwan, Howrah and 24-parganas (N and S). This year was unique in that like the rest of the country, there was hardly any winter, largely due to recurrent troughs all through the winter in the Bay of Bengal. Moisture-laden air moved into the gangetic plains causing heavy fog that often lasted beyond the mid noon. Having not seen the scourge of late blight for last several years farmers were not very fussy about using moderately resistant varieties. The late blight made its presence felt at the right time when bulking starts at 40 - 50 DAS. It came with a vengeance! Before one saw the speckles and browning of fields, the crops collapsed and had a devastated look within a week. What happened? Why was the stem affected even before leaves showed severe symptoms? Why the disease spread like wild fire within a few days when furrow irrigation was applied? Was it a new strain that affected stem first? AAPP teamed up with Plant Health Clinic of BCKV and issued a leaflet warning farmers about the symptoms and stating management options. Application of mancozeb and even metalaxyl largely failed. One investigation by scientists showed that in at least one area in Hooghly there was a simultaneous attack of *Sclerotinia sclerotiorum* that produced nearly same symptoms and similar effects. Obviously much needs to be done to prevent recurrence of what happened this year. Fortunately, BCKV Scientists and Plant Health Clinic are all working full time and it is to be hoped that we will have an answer to this problem soon.

● The nature scientists including all biologists owe a lot to Charles Darwin who changed the course of our thinking about inheritance of characters and evolutionary paths for life to have evolved on planet earth. Darwin was borne in 1809 on 12th February. This is his bicentenary year and 150 years since he wrote his epic volume "*Origin of Species*". We forget very easily! However, to recover lost ground and to pay our homage to that great man who gave us so much food for thought and research we have appended a supplement with this issue of our Newsletter, exclusively devoted to Darwin's life and works, the following controversies, and follow up break through researches attempting to explain what he did through what he called '*Natural Selection*'. We hope you will enjoy it and find a little time to pray for peace of that great man who suffered so much during his mortal life and yet stuck manfully to what he undertook to tell the World!

● AAPP has finally decided to organise a follow up symposium to the one they organised in Dec. 2007. The National Symposium on '*Climate change, Plant Protection and Food Security Interface*' is proposed to be organised tentatively on December 17-19, 2009. Climate change is here! Late blight epidemic in W.B. in Jan - Feb 2009 is a classic example of this. New pathogens, hitherto unknown or known as very weak pathogens are making their presence felt. So are insect pests! Besides, everything we do is now linked to the major global problem that puts all administrations on their tenterhooks, viz., food security. Sub Saharan region is nearly devastated. We have our problems in NE region, also in our granary - Punjab. It is time plant protection scientists took a holistic view of their discipline as affected by climate change and a significantly higher food and feed requirement during the coming decades. Do join the Symposium and make your presence felt through you analytical observations and documentation. We look forward to meeting you to join hands, to work shoulder to shoulder, to resolve this challenging and vexing issue.

We always welcome your inputs and suggestions. Get in touch with us at Secretary, aapp_bckv@yahoo.co.in.

Chitreswar Sen
Editor-in-Chief

On behalf of Editorial Board

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● **Sclerotinia Stem Rot of Potato: A Report from West Bengal--** DURING the potato growing season of 2008-09 farmers of Baikuntapur, Hooghly failed to protect the crop applying different fungicides for management of late blight including Monceren (*Rhizoctonia*-specific). The scientists from Plant Health Clinic Unit, BCKV visited several locations and examined the infected crop. After thorough investigations it was observed that the stem rotting was not associated with late blight or black scurf. It was found that the crop is generally infected at about six wks age and initially water-soaked spots appeared at the point where stems branched, or on branches or stems in contact with the soil. A white cottony growth of fungal mycelium developed on the lesions, and infected tissue became soft and watery. The fungus spread rapidly to nearby stems and leaves

when moisture was present for several hrs. Lesions then expanded and girdled the stem, causing stem rotting and death of the plant within a few days. Hard, irregularly shaped sclerotia formed in and on decaying plant tissues. Heavy nitrogen fertilisation promoted lush, dense, crop canopies, which in turn, provided a favorable environment of high RH. Irrigation during rainy weather on cool, cloudy days prolonged wet periods favourable for disease development. During dry conditions, lesions became dry, turned tan, or bleached white and papery in appearance. The pathogen was isolated and identified as *Sclerotinia sclerotiorum* and this may be the first report of occurrence of *Sclerotinia* stem rot of potato from West Bengal.

(Source: **Subrata Dutta, P. Ghosh** and **S. Kuiry**, Plant Health Clinic Unit, BCKV. Email: subrata_mithu@yahoo.co.in). ■



PPN NEWS: MR KHAN COLUMN



PPN Management: Biofumigation (BF)-- NEMATOCIDES in commercial use are mostly fumigants in nature and are being phased out on environmental issues. The most commonly used is Methyl bromide (MBR). Use of biofumigants have emerged as a major alternative given the restrictions on the use of MBR contaminating

ground water and depleting ozone layer of atmosphere. Isothiocyanates (ITC's) released from brassicaceous plants (BP) through glucosinolate hydrolysis acts as biofumigant. Cabbage, cauliflower, kale, rape or mustard (Brassicaceae), cleome (Capparidaceae) and horse-radish (Moringaceae) all produce ITCs that are highly nematotoxic volatile compounds remaining in soil for few days to a few wks. ITCs suppress soil-borne pests with enhanced biological activities (bioimprover) in soil.

BF with BP has been used in crop rotation and incorporating in soil to suppress root lesion (*Pratylenchus penetrans*) and root knot (*Meloidogyne* spp.) and potato cyst (*Globodera* spp.) nematodes. They are usually grown as cover crops, chopped, mowed at flowering, and then incorporated into the soil and fields, irrigated and often covered with polythene sheet. Brassicas release 30 to 40 different glucosinolate compounds which are converted enzymatically by myrosinase into the ITCs. In BP root-type and leaf-type glucosinolates are known and former are more potent than later.

The production of bioactive compounds may be enhanced effectively by disrupting the plant cells either by freezing or complete maceration with rotovator used for chopping/hand chopping the plant material followed by incorporation into the soil.

Using BP to manage soil-borne pests is not new, but modern science is providing new insights and techniques with justification to enhance their activity. BP can also provide other benefits when incorporated into soil as green manures.

The effectiveness of BF in controlling nematodes, fungi, insects, bacteria and weeds is the same as with the use of conventional pesticides. BF may also regulate viral problems by controlling vector organisms (FAO, Global report on validated alternatives to the use of methyl bromide for soil fumigation). Considerable variations among the BP varieties were reported for disease suppressive chemicals.

Mustards i.e. Caliente Mustards (CMs) have been designed primarily for BF and green manuring. ITCs are produced by the plants when the crop is chopped and incorporated into soil. These results in many benefits including improved soil structure, health and fertility, suppression of various soil-borne diseases and pests and increased soil microbial activity. CMs contain very high levels of glucosinolates and higher levels of the myrosinase enzyme; in addition, they have the potential to grow faster and provide higher biomass per unit input. CMs have been developed with new blends and varieties for performing specific functions, and for growing in different climates and situations.

The seed meal of brassicas also hydrolyse to produce ITCs and mustard meal contains 250µmol/g tissue while commercially available ITC fumigants contain 517-1294 nmol/g soil. Two brassica varieties like humus rapeseed and IdaGold mustard contains higher level of glucosinolates.

The usage of agricultural residues as green manure, particularly from brassicas (using 5-8 kg m² of green matter) either alone or in combination of legumes and grass showed efficacy for managing soil pathogens. While using green manure, crops (dhaincha, crotalaria etc.) should be cultivated in the same field and incorporated after 30 days of sowing for best use of practice for suppression of nematodes.

Brassica green manure (BGM) crops reduced soil populations of citrus nematode by up to 80-90% in both laboratory and field experiments. In Australia, banana growers are growing BGM for nematode management. In USA, farmers have started the practice

of green manure crops with mustard to get effects similar to synthetic fumigation for potatoes. In addition to managing nematodes, growing radish, mustard and broccoli reduced bacterial wilt significantly (50-60%) particularly in sandy soil. However, incorporation of BGM may increase levels of *Pythium* fungi which could increase root rot under wet conditions.

The major limitation of BF is availability of organic amendment material in current production systems. This can be achieved through growing green manure crops of dhaincha, brassicas, compositae, legumes and recycling crop residues of cucumber, pepper, tomato etc. The efficacy of this practice is much

dependent on biofumigant crops, density of plant, moisture, nutrient availability in soil and environmental conditions as all these factors affect glucosinolate production and concentration of hydrolysed byproduct released in soil. The major risk involved in implementing BF strategy for suppression of root-knot nematodes in field is that many brassicas are moderately good hosts for the nematodes. Thus enhancement of soil nematode population may occur while cultivating BP for BF.

The efficacy of BF can be enhanced through combining with soil solarisation or summer ploughing. The organic growers can effectively utilise the benefit of biofumigants for managing pest problems of crops including nemtodes. ■



RED ALERT

Late Blight Menace of Potato in West Bengal -- VAST AREAS in different potato growing areas of West Bengal were attacked by late blight (LB) pathogen exacerbated by dense fog and cool, humid weather during the months of Dec - Jan. The devastating intensity of this disease and another, a stem rot (reported in this NL) in particular areas of Baikunthapur, Hooghly, played havoc with this crop. The presence of two diseases made the management problems more tenuous. The contradictory feedback of few successes and failures in management from the farmers using carbendazim-mancozeb, hexaconazole, propiconazole and validamycin as well as LB specific fungicides (metalaxyl-mancozeb, cymoxanil-mancozeb, fenamidone-mancozeb, and dimethomorph) justified strongly the need for thorough researches and investigations of the problem(s).

At the field level, LB symptoms on stem appeared as lesions often initiated at the point of attachment to the stem or at the cluster of leaves at the top of the stem. Leaves became detached shortly after infection (within 5-7 days). The lesions continued to develop along the length of the stem and often remained active even in hot,

dry weather. In the early morning or during cool, damp weather, a distinctive white, velvety powdery growth could be seen on infected leaves and stems. In many plants stem infection appeared to be the initial foci and such plants collapsed before all the leaves became blighted.

White mold symptoms first appear as water soaked lesions 12 to 18 days following row closure, depending on the cultivar and cultural practices. Lesions usually appeared first in the intersections between the stem and branches, or on branches and stems in contact with the soil. These quickly became covered with a white cottony growth that spread rapidly to nearby stems and leaves when moisture was present for several hrs. As lesions expand they often girdled stems causing foliage to wilt. Stems were frequently hollowed out by the fungus leaving a papery shell to cover numerous sclerotia. Sclerotia eventually fell to the ground as infected stems dried out and the host plant dies. No rot symptoms were observed on below-ground tissues, i.e. roots, stolons or tubers.

(Source: [Subrata Dutta](#), Plant Health Clinic Unit, BCKV, Kalyani. E-Mail: mithu_subrata@rediffmail.com) ■



Late blight devastated potato field



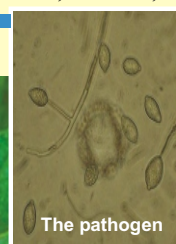
Stem & petiolar infection



Affected plant at early stage



Leaf infection



The pathogen

NEWS IN BRIEF



Mites on grain foliage

● **Crop Pests Changing with Pesticides, GM --** MITES LIKE this (see pic) are on the rise and are one of the harder pests to control. Increasing pesticide use is changing the profile of insect and other pests that Australian farmers must contend with, and genetically modified (GM) crops are set to bring their own changes.

Weeks and colleagues compared recent reports of winter grain pests with those dating back as far as 1980. They found pests such as armyworms and pea weevils have declined, but other pests such as mites and lucerne fleas have been on the rise. They found

that a couple of species of mites, which weren't even really recorded early on, had become quite prevalent now. While some of these changes are likely to be associated with drier climates, the researchers say that there has also been an increase in pesticide use.

Weeks says drought-stressed farmers worried about losing their crop to pests have been carrying out extra "insurance" sprays of pesticides before they put in their crops. While pesticide use has increased, it's knocking out a lot of other pests but it's not harming these mites as much. He also says the greater herbicide use has led to a decline of beneficial species like carabid beetles that are effective predators of slugs and snails.

(Source: [Anna Salleh](#) for ABC Science Online, Posted November 18, 2008). ■

● **CAPS Analysis: A Possible Tool to Detect and Group Geminiviruses Infecting Some Fibre Crops and Weeds--**



SOME FIBRE crops and weeds, showing typical symptoms caused by begomoviruses, were subjected to PCR amplification using different sets of primers specific for DNA- α and DNA- β molecules of begomoviruses. Restriction digestion of full length DNA- α and DNA- β using different enzymes revealed variation in

restriction profiles amongst the virus isolates in the present study. Moreover, variation in the restriction profile of different DNA- β molecule with that of their corresponding reported sequences were also noticed.

(Source: A. Chatterjee, A. Roy, and S. K. Ghosh. February 2009).

● **Labeling of GM Food: Health Ministry Passes on the Buck to FSSAI--**



MANDATORY labeling of genetically modified (GM) food in India is likely to be delayed as the Union health ministry has planned to pass on the responsibility to the newly set up autonomous Food Safety and Standards Authority (FSSAI).

In March, last year, the committee of experts and stakeholders constituted by the Union health ministry under the chairmanship of the additional DG of the National Institute of Communicable Diseases, Shiv Lal, had

unanimously recommended mandatory labeling of all GM foods irrespective of the threshold level.

More than a year has lapsed. The panel recommendations on a vital issue like mandatory labeling of GM food has not been implemented due to pressures from the biotech industry and the US, which had cited reasons for hampering global trade. Making several excuses for the delay, the Union Health Minister, Ambumani Ramadoss said, "We have decided to pass on the recommendations of the panel to FSSAI to decide on the issue. I am of the view that all food items should be labeled disclosing its ingredients." The FSSAI has been set up in July last year, with PI

Suvrathan as its Chairman and G Balachandran as its CEO.

Under the Food Safety and Standards Act-2006, the FSSAI has powers to regulate GM food. The Genetic Engineering Approval Committee (GEAC), which has exclusive powers to regulate all GM products under the Environment Protection Act-1986 and EP Rules-1989, has also not been proactive on the issue of labeling of GM food, even though the annual amendments to the Foreign Trade Policy made in April 2006 had said that unlabelled GM products import would attract penal action under Foreign Trade (Development and Regulation) Act-1992. Already several NGOs have brought to notice cases of unlabelled GM products being imported.

(Source: Ashok B Sharma, Posted: 2008-10-13. Indian Express).

● **Yellow Rust from Pak Hits Crops--**



BESIDES militants, deadly crop diseases also infiltrate into India from Pakistan. And this time, an airborne disease from across the border has hit the standing wheat crop badly in border villages and districts. Yellow rust disease has damaged the entire wheat and mustard crops on over 6,000 acres in 15 villages in the districts. Prospects of a bumper crop turned sour due to this rust. The crops are usually damaged in shelling, mine blasts, militant activities, but 'have never confronted this disease before'. The repayment of loans to banks and private agencies is compounding their problems. The government

has not assured them of any help so far. When the wheat crop ripens, earth virtually looks golden. But this disease has rendered the plants yellow. Only yellow powder falls when the cobs are inspected. The affected villages are Nanga, Rangoor, Jard Avtal, Nandpur, Brahmna, Chak Glotra, Chak Jwar, Jerdad, Paradey, Narainpur, Fatwal, Jasso-Chak and SM Pura, all in this border district.

Yellow rust is an airborne fungal disease and fungicides like Dithane M-45 and tropiconazole could be used to check the disease, though only in initial stages, said RR Jaat, Asst. Dir. Res, Sher-e-Kashmir University of Agriculture. Aghast farmers told the Tribune team that they used different pesticides recommended by the Department of Agriculture, but all proved useless.. The farmers have given up all hope.

(Source: The Tribune, New Delhi, March 4, 2009) ■

Announcement:

**National Symposium on
Climate Change, Plant Protection
and Food Security Interface**

Dates: 17-19 December, 2009

**Venue: FTC, Bidhan Chandra Krishi Viswavidyalaya,
Lake Hall, Kalyani, W.B.-741235**

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