Organic Farming

Bio-fertilizers for sustaining potato productivity in rainred hills

MK Jatav, Manoj Kumar, VK Dua and SS Lal

Division of crop production
Central Potato Research Institute, Shimla-171 001 (HP)
Email: sslalcpri@Yahoo.com

ABSTRACT

Studies conducted on role of *Azotobacter* and phosphorus solubilizing bacteria (PSB) on N and P economy under rainfed conditions in mid hills of Shimla and its regional stations revealed significant response to nitrogen application as well as *Azotobacter* applied through seed tuber inoculation. However, combined application of N along with *Azotobacter* was found to be best as indicated by increase in number of medium and large sized tubers, total tuber yield and also the nutrients uptake by potato. Role of phosphorus (P) and phosphorus solubilizing bacteria (PSB) on P use efficiency by the potato crop revealed significant response to P application as well as PSB applied through seed tuber inoculation. Their combined application gave higher yields of medium sized tubers, total tuber yield and also nutrients uptake. Phosphorus recovery was also higher in combined application of PSB and P than that of application of P alone. Thus, seed inoculation with *Azotobacter and* phosphate solubilizing bacteria (PSB) reduced N and P requirement by 25%. The beneficial effect of PSB in soils in native P is attributed to the release of native P present in the soil by these P solubilizing bacteria which in turn make sufficient P in soil solution around root zone as indicated by the higher P recoveries in presence of lower P doses.

Keywords: Potato Productivity, *Azotobacter,* Phosphorus solubilizing bacteria, Rainfed conditions Recoveries

Effect of organic manures and biofertilizers on yield and economics of cabbage, *Brassica oleracea* var. *capitata*

I. Sarma, D. B. Phookan and S. Boruah

Department of Horticulture, Assam Agricultural University, Jorhat-785013, Assam, India
Email: hsbarua63@yahoo.co.in

ABSTRACT

The field experiment laid out in randomized block design with six treatments and four replications during 2008-09 at experimental farm, Department of Horticulture, Assam Agricultural University, Jorhat revealed that the treatment comprising of combined application of azotobacter + cowdung + rock phosphate (RP) + phosphate solubilizing bacteria (PSB) yielded the maximum cabbage head 29.39 t ha^{-1} with maximum benefit-cost ratio (3.04) for the trait. The treatment also improved other growth traits viz., number of wrapper leaves, root length and the root spread.

Key words: Organic, cabbage, growth, yield, cowdung, profitability.

Impact of organic manure and organic spray on soil microbial population and enzyme activity in green chillies

K. Vinoth Kumar and P. Singaram

Department of Environmental Sciences, TamilNadu Agricultural University, Coimbatore, TamilNadu, India – 641003.
E-mail:vinoens@gmail.com

ABSTRACT

The pot culture experiment conducted at the Department of Environmental Sciences, Tamil Nadu Agricultural University, Coimbatore, to evaluate the effects of concentrated organic manure (jatropha oilcake) and panchagavya (organic foliar spray) on soil microbial population and enzymes activity revealed higher soil microbial population viz., bacteria, fungi and actinomycetes under the application of 100% jatropha oil cake with 3% foliar spray of panchagavya. Soil enzymes activity *viz.,* dehydrogenase, urease and catalase were maximum in treatment receiving 100% jatropha oil cake with 3% foliar spray of panchagavya.

Key words: Jatropha oil cake, Panchagavya, Green chillies, Soil microbial population and Enzyme activity.

Effect of organic manures and biofertilizers on production of organic litchi

P. Dutta, S. Biswas and S. Kundu

Department of Fruits and Orchard Management, Faculty of Horticulture
Bidhan Chandra Krishi Viswavidyalaya, P.O. Mohanpur -741252, West Bengal
E-mail : pallab_bckv@rediff.com

ABSTRACT

The investigation carried out during 2006-2008 at the farmer's field of Murshidabad district, West Bengal, revealed that different treatments of organic manures and biofertilizers significantly improved the soil health, fruit quality, yield, leaf mineral content and microbial population of rhizosphere soil of litchi. Among different treatments, T_5 consisting of *Azotobacter* + *Azospirillum* + VAM + vermicompost showed maximum soil organic carbon, available nitrogen, phosphorus and potasium with higher (6.92) soil pH. This treatment also exhibited highest (99.72 kg/plant) yield with maximum (21.20^0 brix) TSS, total sugar (14.87%) and TSS : acid ratio (37.1 : 1) while control recorded minimum of these qualities. Leaf mineral content and soil microbial population were also influenced by the application of organic manures and bio-fertilizers. Maximum (1.89%) N content of leaf and microbial population were measured from T_5 while maximum P and K content were measured from T_6 (*Azospirillum* + VAM + Vermicompost) and T_8 (*Azospirillum* + Vermicompost) respectively. It is concluded that T_5 (*Azotobacter* + *Azospirillum* + VAM+Vermicompost) can be applied for production of organic litchi which are considered safe and residue free.

Key words : Soil health, Organic manure, Bio-fertilizers, Fruit quality, Litchi.

Effect of organic manure on yield and quality of litchi cv. Rose Scented

R.L. Lal, D.S. Mishra and Nidhi Rathore

Department of Horticulture, College of Agriculture
G.B. Pant University of Agriculture & Technology, Pantnagar
U.S. Nagar – 263 145 (Uttarakhand)

ABSTRACT

The field experiment conducted at Horticulture Research Centre, Patharchatta with ten treatments including vermicompost, poultry manure and FYM at different rates

revealed maximum fruiting, fruit set, fruit volume, edible portion and maximum yield with application of vermicompost at the rate of 75 kg tree^{-1}, while maximum TSS, ascorbic acidity and total sugar were recorded under the treatment of FYM @ 150 kg ha^{-1}. Titrable acidity was maximum under control. No significant result regarding fruit cracking percentage was obtained.

Key words: Vermicompost, poultry manure, FYM, Litchi.

Nimoria – an effective neem based urea coating agent for increasing fertilizer use efficiency to enhance sugarcane and sugar yields

Divyang Mehta[1] and D. J. Patel[2]

[1] Kisan Group PVT. LTD., 6th Floor, Ashoka Chambers, Near Lion Hall, Mithakhali Circle, Ahmedabad-380006. email: kbpl@2visp.com
[2] Ex. Principal and Dean, B. A. College of Agriculture, Anand Agricultural University, Anand-388110. E-mail: davabhai@yahoo.com

ABSTRACT

Application of 275 kg N ha^{-1} as urea coated with 500 g nimoria 50 kg^{-1} bag of urea gave significantly more numbers of tillers (3.80%) and millable canes (13.57%) which ultimately gave significantly more sugarcane (19.11%) and sugar (17.27%) yields over the treatment of 275 kg N ha^{-1} as urea alone. The next best treatment was application of 275 kgN ha^{-1} as urea coated with 400 g nimora 50 kg^{-1} bag of urea. The treatment of 275 kg N ha^{-1} as urea + neem cake (5:1),though better than control- no urea, was statistically at par with recommended dose of 275 kg N ha^{-1} as urea alone .However, sugar cane juice quality (CCS%) was not affected by any of the treatments. Based on the economics of the treatments, the application of 275 kg N ha^{-1} as urea coated with 500 g nimoria 50 kg^{-1} bag of urea gave highest net realization of Rs.16,080 ha^{-1} over the recommended dose of 275 kg N ha^{-1} as urea alone.

Key words : Urea, Nimoria, sugarcane, sugar, yields, net realization.

Bio-efficacy of plant growth regulators in Bt. cotton

Jyothi Hunnnur, C.M. Nawalagatti, M.B.Doddamani and M.B.Chetti

Department of Crop Physiology, University of Agricultural Sciences, Dharwad-580 005 Karnataka, India

ABSTRACT

The field experiment conducted during *Kharif* 2006-07 with ten treatments *viz.*, mepiquat pentaborate (1000, 1500, 2000, 4000 and 6000 ppm), chloromequat chloride (60 and 100 ppm), mepiquat chloride (100 and 200 ppm) and control on Bt Cotton (JK-99) revealed that, the application of mepiquat pentaborate @ 1000 ppm increased the plant height as compared to other treatments. However, the plant height was significantly higher than all other treatments. The morpho-physiological triats *viz.,* number of sympodial branches, number of nodes, stem girth and total dry matter content were significantly increased with application of mepiquat pentaborate (1000 ppm) over all the treatments. The growth parameters like LAI, CGR, SLW and LAD also increased significantly due to application of 1000 ppm mepiquat pentaborate. Similarly, the treatment registered significantly maximum seed cotton yield as compared to all other treatments.

Key words: Bioefficacy, Bt. cotton, sympodial branch, yield.

Effect of plant growth regulators on growth, biochemical traits, yield and yield attributes in Bt Cotton

C.M. Nawalagatti, M.B. Doddamani, R.H. Jyothi, and M.B. Chetti

Department of Crop Physiology, Universtiy of Agricultural Sciences, Dharwad - 580 005, Karnataka, India
Email:ali_dods@yahoo.com

ABSTRACT

The field experiment conducted on Bt cotton var. JK 99 during *kharif* 2006-07 at MARS, Dharwad revealed that application of mepiquat pentaborate @ 1000 ppm recorded significantly maximum total dry matter content, increased chlorophyll content, nitrate reductase and higher seed cotton yield over the control.

Keywords: Bt cotton, growth retardant, nitrate reductase, yield component.

Influence of seed hardening chemicals, growth retardants and chemicals on morpho-physiological traits and yield in Chickpea (*Cicer arietinum* L.)

C.M. Nawalagatti, C.K. Ramesha, M.B. Doddamani, M.B. Chetti

Department of Crop Physiology, University of Agricultural Sciences,
Dharwad-580 005, Karnataka, India
Email:ali_dods@yahoo.com

ABSTRACT

The experiment conducted during *rabi* 2005 and 2006 on influence of seed hardening chemicals, growth retardant and chemicals on morpho-physiological traits and yield of chickpea (*Cicar arietinum* L.) revealed significant increase in the plant height and total dry matter content due to seed treatment with $CaCl_2$ (2%) as compared to other treatments. Further, significant increase in the growth parameters *viz.,* leaf area index (LAI), crop growth rate (CGR), specific growth rate (SGR), leaf area duration (LAD), biomass duration (BMD), relative water content (RWC) as also as the seed hardening and chickpea seed yield was also recorded under $CaCl_2$ (2%) seed treatment followed by CCC (500 and 1000 ppm).

Key words: Chickpea, growth parameter, relative water content, seed hardening yield.

Optimization of plantlet stage for vetiver (*Vetiveria zizanioides*) plantation in different soil provenances

Maneesh Kumar Gupta[1] and Y. Vimala

Department of Botany, CCS University, Meerut, (U.P.)-250004
[1] School of Biotechnology, Shobhit University, NH-58, Modipurum, Meerut (U.P.)-250 110
email: aadimaneesh@gmail.com)

ABSTRACT

Vetiver plantlets, 4, 5 and 6-leaf stages were planted in the pots, containing soil of selected provenances, i.e., ditch site (DSS), before effluent entry (BEE) and after effluent entry (AEE) and analysed monthly for six months to find out its suitability for culturable wastelands reclamation. Among all the sets, 6-leaf stage AEE grown pot plantation could not survive up to the end of 5 months and died. On the basis of tillering, per cent organic carbon (%OC) and nitrogen status in soil and plant during study period (0-5 months) 5-leaf plantlets responded well in all experimental soil compared to irrigated garden soil (IGS) (control) and were selected for further work. Among the 3 leaf stages, the plantlets of 5-leaf stage seem suitable for plantation for reclamation of wasteland.

Key words: Vetiver, soil reclamation, wastelands, miracle grass

Entomology

Ecofriendly management of Sorghum shoot fly, *Atherigona soccata* Rondani through seed treatment

Anita V. Sable and Shekharappa[1]

Department of Agricultural Entomology, University of Agricultural Sciences, Dharwad-580 005, Karnataka, India
E mail: shekhar1993@yahoo.com

ABSTRACT

Studies conducted on the management of shoot fly *Athertigona soccata* Rondani in sorghum through treatment of its seed with various organics during *kharif* 2008 at Dharwad revealed that NSKE (5%) seed treatment recorded significantly less mean number of shoot fly eggs plant^{-1} (0.68) and least number of deadhearts (31.00%). Neem oil (2%) seed treatment recorded the highest yield (15.21 q ha^{-1}) which was on par with NSKE 5% (14.72 q ha^{-1}), Azagro 5% (14.14 ha^{-1}) and plant mixture 5% (14.57 ha^{-1}). However, endosulfan and imidacloprid seed treatments recorded significantly less deadheards (17.66% and 18.33%, respectively) and highest grain yield (17.32 and 17.12 q ha^{-1}, respectively) than all organic treatments. NSKE (5%), among all organic treatments, recorded highest incremental benefit cost ratio (210.8:1).

Key words: Sorghum shoot fly, organic, plant extract, seed treatment

Efficacy of *Azadirachta* and *Sphaeranthus* in the management of pulse beetle, *Callosobruchus chinensis* L. in greengram

S. S. Patole

Department of Zoology V. V. M's. S.G. Patil Arts, Sci. and Commerce College, Sakri Dist- Dhule (M.S.) 424 304, India.

ABSTRACT

Aqueous, alcohol and acetone extracts of neem seed kernal and gorakhmundi leaves at 0.25 % and 0.50 % concentrations were tested to evaluate their efficacy on prevention of weight loss in green gram, *Vigna radiata* Linn seeds due to pulse beetle *Callosobruchus chinensis* infestation. Data revealed that 0.50 % alcohol extract of neem was highly effective in protecting green gram from *C. chinensis* with minimum loss in the seed weight (1.66 %) throughout the storage period of 24 weeks and was significantly superior to aqueous and acetone extracts of neem at same concentrations (2.32 % and 2.38 %, respectively). The treatment with 0.25% alcohol extract of gorakhmundi recorded

considerable loss of (6.44 %). All the treated groups registered significantly lower loss as compared to untreated control (9.68 %).

Key words: Indigenous, Neem, Gorakhmundi, Greengram seeds, Pulse beetle.

Biology of predatory beetle, *Chilocorus infernalis* Mulsant (Coleoptera: Coccinellidae) on San Jose scale, *Quadraspidiotus perniciosus Comstock* (Homoptera : Diaspididae)

K. A. Sheikh, A. M. Bhat, M. I. S. Waliullah and F. Hassan

Division of Entomology, Sher-e-Kashmir University of Agricultural Sciences and Technology of Kashmir, Shalimar, Srinagar-191121 (J&K), India.
E-mail: sheikhento@gmail.com

ABSTRACT

In vitro study on the biology of lady bird beetle, *Chilocorus infernalis on* san jose scale revealed that mean duration of pre-mating, mating, oviposition, incubation, total grub, pre-pupal and pupal stages lasted for 5.20 ± 0.83, 49.20 ± 12.56 (minutes), 29.40 ± 3.78,6.30 ± 0.82, 16.80 ± 0.87,2.60 ± 0.51 and 8.40 ± 0.51 days respectively. The mean adult longevity of male and female was 41.60 ± 2.07 and 67.40 ± 10.81 days with sex ratio of 0.98: 1, respectively.

Keywords: *Chilocorus infernalis,* predatory beetle, biology, San Jose scale,

Efficacy of indigenous materials against *Aphis gossypii* on okra

C. P. Mallapur and D. N. Dhanalakshmi

Department of Agricultural Entomology

University of Agricultural Sciences, Dharwad – 580 005 (Karnataka), India

ABSTRACT

Investigations on the efficacy of indigenous materials singly and in combination against *A. gossypii,* carried out during *kharif* 2005-06 at Main Agricultural Research Station, Dharwad, revealed that the efficacy of NSKE (5%) + green chilli kerosene [GCK] (0.5%) + cow urine [CU] (5%) treatment was comparable to that of oxydemeton methyl 25EC (0.15%) in reducing the aphid population. The next best treatments included GCK +CU + cow dung [CD], GCK+CU, green chilli extract [GCE] + CU+CD, GCK and NSKE. The maximum good fruit yield was recorded in NSKE+ GCK+CU (41.55 q ha^{-1}) with highest IBC ratio (15.8 :1.0) followed by GCK+CU+CD (37.57q ha^{-1} with IBC ratio 14.5 :1) and GCK+CU (37.56q ha^{-1} with IBC ratio 14.5 :5.0). All the indigenous materials proved safe to natural enemies in okra ecosystem.

Key words: Aphids, indigenous materials, green chilli kerosene, okra.

Field evaluation of entomopathogenic fungus, *Acremonium zeylanicum* (Petch) W. Gams and H. C. Evans against sugarcane woolly aphid, *Ceratovacuna lanigera* Zehtner

C. P. Mallapur and N. B. Patil

Department of Agricultural Entomology

University of Agricultural Sciences, Dharwad – 580 005 (Karnataka), India

ABSTRACT

Field evaluation of entomopathogenic fungi, *A. zeylanicum* against sugarcane woolly aphid revealed significant reduction of pest grade in treatments with higher concentrations of the fungus (1×10^{10} conidia/l and 1×10^{8} conidia/l) which recorded 2.01 and 2.40 grade, respectively at 14 days after spraying. However, lower concentrations reduced the pest intensity at moderate level. In general, there was significant reduction in aphid population after 14 days of application in all the fungal treatments (63.47, 50.29, 46.24 and 36.25 % reduction in T_1, T_2, T_3 and T_4, respectively) in spite of increasing trend in the aphid population as evidenced from untreated check. The influence of fungal sprays on natural enemies indicated that population of *Encarsia flavoscutellum* Zehntner reduced from 14.35 to 9.90 adults/leaf in 1×10^{10} conidia/l concentration due to reduced aphid number. However, the population of the predators (*viz*., *Micromus igorotus* Banks and *Dipha aphidivora* Meyrick) was not much influenced by the treatment imposition.

Key words: *Acremonium zeylanicum*, sugarcane woolly aphid, *Ceratovacuna lanigera*

Attraction of syrphid predators in the management of sugarcane woolly aphid

L.E. Likhil and C. P. Mallapur

Department of Agricultural Entomology

University of Agricultural Sciences, Dharwad – 580 005 (Karnataka).

ABSTRACT

Field studies undertaken to evaluate the role of different attractants in enhancing the activity of syrphids namely, *Eupodes confrater* and *Dideopsis aegrota* in sugarcane ecosystem revealed that molasses and fruit fly diet attractants recorded comparatively more syrphid population (59.25 - 64.49% and 55.48 - 57.67% increase, respectively) eventually registering lower mean aphid grades of 2.64 - 2.67 and 2.94 - 2.98, respectively. The next best treatment was jaggery solution which recorded 43.22 and 29.26% mean increase in larval population as influenced by 1st and 2nd spray application. However, sugar syrup and white coloured attractants proved less effective.

Key words: Sugarcane woolly aphid, syrphids, attractants, fruit fly diet

Botanical pest management in berseem+ mustard mixed forage crop production

N.K.Shah, P.Saxena, M.I.Azmi, S.Roy and P.K.Tyagi

Indian Grassland and Fodder Research Institute, Jhansi (UP)

ABSTRACT

The field experiment with various combinations of botanicals evaluated for the management of various pests/diseases in berseem + mustard fodder production system. revealed that although synthetic pesticidal combinations recorded maximum reduction in the stem/root rot intensity in berseem (68.76) and aphid population in mustard (68.22), various combinations of botanicals seed coating with NSK powder + sprays of NSK extract provided maximum protection i.e. a reduction of 68.22% in the stem/root rot intensity in berseem and a reduction of 70.28% aphid population in mustard and 42.0% of plant parasite nematode (PPN) and consequently an increase of 33.61% in GFY over control. The treatment also harboured (approximately triple the population of beneficial

soil arthropods, the collembolans and mites in comparison to untreated check. However, the economics of various botanicals revealed maximum net return under trineem + endosulphan (0.07%)+ dithaneM-45 (0.1%) followed by trineem + NSKE (3%) with a cost benefit ratio of 1.01 and 1.03, respectively.

Keywords: Botanicals, disease, forage production system, insect pests and management, micro-arthropods and nematodes.

Screening of different tomato varieties against major insect pests*

Shailesh Patil[1], P.K. Singh[2], Rajesh Verma[1], Umesh K. Patil[3] and Neelam Patil[3]

[1]*Fruit Research Station Bairasiya Road Entkhedi, Bhopal (M.P.) India*
[2]*Department of Agriculture Zoology & Entomology, RBS College, Bichpuri (U.P.) India*
[3]*Department of Pharmacognosy, VNS Institute of Pharmacy, Bhopal (M.P.) India*

ABSTRACT

The field trial revealed that varieties TBR-1, Pusa hybrid-2, PAV-1947, H-24 and BSS-9 with lowest infestation of leaf minor (1.0 mines plant^{-1}), tomato fruit borer (8.44% fruit damage), white fly (nil -0.58 plant^{-1} cage^{-1}) and jassid (0.06 plant^{-1}) registered least susceptible reactions, respectively. Although, no variety was rated resistant against any of the insect pest except PAV-1947 for white fly, the Pusa hybrid-1 for leaf minor, Jawahar tomato -99, NDT-5, ARTH-4, NDT-3 and Indira - PKM -1 for white fly and Sun -145 for jassid were tolerant. Varities NDT-5, NDTRX -73, Pusa hybrid -1 and Arka vikas showed high susceptibility to leaf minor, tomato fruit borer, white fly and jassid infestation, respectively.

Keywords : Screening of tomato varities, *Helicoverpa armigera, Bemasia tabaci, Emposca devastans, Liriomyza trifolii*

Influence of larval age at grafting and number of queen cell cups grafted for larval acceptance for queen production in *Apis mellifera* colonies

M.A. Parray, Muneer Ahmad and S.K.Kakroo

Division of Entomology
Shere-Kashmir University of Agricultural Sciences and Technology, Shalimar Campus Srinagar, India 191121

ABSTRACT

Experiments conducted to assess the influence of larval age at grafting and the number of queen cell cups grafted for larval acceptance in mass queen rearing of *Apis mellifera* colonies during the spring and Autumn 2007, the apiary of Division of Entomology SKUAST-K, Shalimar revealed that larval acceptance was highest (30.5%) in autumn and 76.5% in spring when 24 hr old larvae were grafted and minimum (29.5%) in autumn and 76.0% in spring when 72 hr old larvae were grafted. The higher acceptance of 24 hr larvae revealed that younger larvae in April was due to the presence and availability of major bee flora in surplus. Results of next experiment revealed that the mean % acceptance of the grafted larvae was maximum (76.5%) in spring and 30.5% during autumn when 30 queen cell cups were used. Results also exhibited that by increasing the number of queen cell cups (30, 60, 80, 110) decrease in acceptance was recorded.

Key words: Influence, Larval age, grafting, acceptance and *Apis melllifera*

Plant Pathology

Management of grapewine anthracnose disease with botanicals and bio-control agents

E. Rajeswari, R. Akila and A. Kamalakannan

Department of Plant Pathology, Tamil Nadu Agricultural University, Coimbatore-641 003

ABSTRACT

Antifungal effects of 15 plant extracts, neem oil 80EC, pungam oil 80EC, neem + pungam 60 oil EC and nine antagonistic organisms were invested *in vitro* against the mycelial growth and conidial germinaton of *Gloeosporium ampelophagum* causing anthracnose disease in grapewine. Neem + pungam oil 60EC (3%), leaf extract of *Catharanthus roeus* 10% and neem oil 80 EC (3%) were inhibitory to the mycelial growth and conidial germination of *G. ampelophagum*. Among the antagonistic organisms *Trichoderma viride* and *Pseudomonas fluorescens* adversely affected the growth and conidial germination of the pathogen. Post inoculation spraying of neem + pungam oil 60 EC 3%, *C. roseus* leaf extract 10% and talc based formulation of *P. fluorescens* in the green house was found to be promising in preventing the disease. Spraying of the above mentioned botianicals and biocontrol agent thrice, first after the initiation of the disease and second and third at 10 days intervals effectively controlled the disease in the field.

Keywords: Grapewine anthracnose, plant extracts, plant oils, biocontrol agents, management

Comparative batch growth studies of pure cultures and coculture of *Lactobacillus sp.* in submerged fermentation

Manoj K. Ghosh, U.K. Ghosh

Department of Paper Technology I.I.T. Roorkee, Saharanpur Campus

Saharanpur-247001, U.P. India

ABSTRACT

The study includes three sets of batch experiments carried out in anaerobic submerged fermentation to investigate the comparative biomass growth kinetics and acid formation in terms of pH drop effected by *Lactobacillus delbrueckii* (NCIM) 2025, *L. pentosus* (NCIM) 2912 and their coculture utilizing MRS culture media (without any neutralizer). The first two sets were kept at 30°C, initial pH 7.0, 0.1 g l^{-1} (cell dry weight) as inoculum dose, having 150 rpm and static conditions, respectively, while the third set was carried out at 36° C, 180 rpm, pH 7.0 and inoculum dose of 0.10 g l^{-1} (cell dry weight). The maximum cell dry weights, attained by the coculture in experiments (1), (2) and (3) during 18 h growth study were 16.15,12.21 and 24.12 g l^{-1}, respectively while, the maximum pH drop values were 5.16, 5.22 and 4.39, respectively. It was also found that the coculture exhibited better acid tolerance, thermo tolerance and better adaptablility in comparison to pure stains in all the experiments. The findings suggested superior performance of coculture in biomass growth and acidification than the pure cultures.

Key words : Anaerobic, submerged fermentation, coculture, *L. delbrueckii, L. pentosus*,

Effect of metabolites produced by *Trichoderma* spp. against white mould *(Sclerotinia sclerotiorum)* in butter bean

P.K. Jain[1], I.J. Yadava[2], R. Ranjan[1], R.Tiwari[1], S.R. Yadava[2], and R.K. Gaur[1]

[1]*Biotechnology Laboratory, Department of Science, FASC, MITS University, Lakshmangarh-332311, Rajasthan, India.*

[2]*K.S.S. P.G. College, Ayodhya, Faizabad-224001, U.P., India*
email: pankajbiotech2001@yahoo.com

ABSTRACT

Laboratory experiment on *in vitro* testing of *Trichoderma* spp. (*T. virens, T. harzianum, T. virdae*) for their efficiency in inhibiting the growth of *Sclerotinia sclerotiorum* causing white mould disease in *Phaseolous lunatus* revealed exhibition of fungistatic effect inhibiting *S. sclerotiorum* growth between 0.00 to 25.66% for volatile, 0.00 to 53.33% for non-volatile and 62.22 to 77.78% for direct diffusibles. However, metablities produced by *T. virens* and *T. harzianum* effected significant reduction in *S. sclerotiorum* growth.

Key words: *Trichoderma,* non-volatile and volatile compounds, *Sclerotinia sclerotiorum*

Potentials of neem seed oil in wood protection through fumigation

Himani Pant and Sadhna Tripathi

Wood Preservation Discipline, Forest Products Division, Forest Research Institute, Dehradun, India

E-mail: tripathis@icfre.org

ABSTRACT

The laboratory experiment conducted to determine the potential of neem seed oil as fumigant against wood decaying fungi i.e. *Trametes versicolor* Linn. and *Oligoporus placentus* Murr. revealed that neem seed oil (3.9%) imparted more than 82% protection, reducing weight loss of 6-10% against the control (51-58%), in soft and hard woods.

Key words: Brown rot, Fumigant, Hard wood, Soft wood, White rot

Integrated management of early blight of potato caused by *Alternaria solani*

Vinkal Wazir[1*], Vikas Gupta[2] and P.K.Mishra[2]

[1]*Department of Plant Protection, CCS University Campus, Meerut. U.P., India*
[2]*Division of Plant Pathology, Shere Kahsmir University of Agricultural Sciences – Jammu.*
Email: vicky_mahajan2k@yahoo.co.in

ABSTRACT

The field experiment to manage early blight of potato (*Alternaria solani*), a world wide disease of potato crop, through integrated use of bio-control agents, botanicals and fungicidal treatments viz. mancozeb (0.25%), copper oxychloride (0.3%), hexaconazole (0.05%), azoxystrobin (0.2%), *A. niger* - V (0.4%), *A. niger* - V + sticker (0.4% + 0.1%) revealed that azoxystrobin was found the most effective treatment in two successive years. Among the bioagents, *A. niger* with sticker gave satisfactory results in reducing the disease incidence and was found statistically at par with azoxystrobin.

Key world: *Solanum tuberosum, Alternaria solani*, *Aspergillus niger*, Azoxystrobin, Bioagents, Hexaconazole

Nematology

Bio-efficacy of anti-nemic plants against root-knot nematode in medicinal coleus

N. Seenivasan

Department of Fruit Crops, Horticultural College & Research Institute, Tamil Nadu Agricultural University, Coimbatore 641003, Tamil Nadu, India.
Email: seeni_nema@yahoo.com

ABSTRACT

The effect of growing nematode antagonistic crops such as sunhemp, mustard, marigold, castor, onion and cowpea as intercrop and their biomass incorporation during earthing up in medicinal coleus, *Coleus forskohlii* cultivation, evaluated against the root-knot nematode, *Meloidogyne incognita* under glasshouse and field conditions, revealed that all the tested plants reduced *M. incognita* population and increased the root tuber yield. Among antagonistic plants tested, marigold was found significantly superior in reducing the nematode population in soil, gall formation in roots and increased the root tuber yield followed by sunhemp, cowpea, mustard, onion and castor. Marigold treatment reduced *M. incognita* populations by 43.3 -59.6 % in soil and recorded least gall index of 2.2–3.0 in medicinal coleus plants. Marigold inter cultivation increased root tuber yield of medicinal coleus by 35.6 % under glasshouse condition and 15.0 % under field condition.

Key words: Medicinal coleus, root-knot nematode, antagonistic plants.

Short Communication

Feeding potential of Staphylinid predator (*Oligota sp.*) on two spotted spider mite, *Tetranychus urticae* infesting apple (*Malus domestica* Borkh) in Kashmir

A.Q.Rather & M.A.Rangrez*

Division of Environmental Sciences, Sher-e-Kashmir University of Agricultural Sciences and Technology of Kashmir, Shalimar – 191 121
**Directorate of Extension Education, SKUAST-K, Shalimar.*
E-mail: acar_rather@yahoo.co.in

Key works: Mite pests, Apple, Oligota, Predation, Biological control

Seasonal activity of major insect pests of tomato and their occurrence influenced by weather parameters*

Shailesh Patil[1], P.K. Singh[2], Rajesh Verma[1], Umesh K. Patil[3] and Neelam Patil[3]

[1]*Fruit Research Station Bairasiya Road Entkhedi, Bhopal (M.P.) India*
[2]*Department of Agriculture Zoology & Entomology, RBS College, Bichpuri (U.P.) India*
[3]*Department of Pharmacognosy, VNS Institute of Pharmacy, Bhopal (M.P.) India*

Efficacy of certain neem formulations and biopesticides against S*podoptera litura* (Fabr.)

*K. Rahul Viswakarma, K. Mohan and M. Deepa

Department of Entomology and Agril.Zoology, I.Ag.Sc, B.H.U., Varanasi-221005
*Email: *chryso666@gmail.com*

Key words*:* *Spodoptera litura*, neemarin, vanguard, multineem, *B. basiana* and biolep