

# Prospects of Neem (*Azadirachta indica* A.Juss.) in the management of insect pests of stored grain in developing countries

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Storage of food grains must have commenced much before the cultivation of crops began. The wandering man getting an access to extra food must have collected for consumption when it was not available. He must have kept it at safe place to protect it from insect and other herbivores. From simple storage structures made of mud and other locally available plant materials it has now grown into modern big silos for bulk storage of food grains.

## Organic cultivation of chilli – an assessment in West Tripura district of Tripura

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### ABSTRACT

Organic performance of chilli (var: Balujhuri), assessed during 2010-2013 in farmers' participatory approach, showed pooled increase (35, 80 and 110 DAS) in plant height and number of branches plant<sup>-1</sup> by 21.15 and 14.26 % in organic treatment, respectively in comparison to conventional one. Under reproductive growth attributes, the total number of fruits plant<sup>-1</sup>, individual fruit length (cm), total fruit weight (g plant<sup>-1</sup>), seed numbers fruit<sup>-1</sup> and yield (t ha<sup>-1</sup>) were recorded to be 239.29, 9.62, 243.93, 118.47 and 11.08 followed by 184.05, 7.13, 180.59, 104.09 and 9.08 under organic and conventional practices, respectively. Net return was 2.97 lakh ha<sup>-1</sup> with BC ratio 4.70 and 2.46 lakh ha<sup>-1</sup> with BC ratio of 3.48 in organic and conventional practice, respectively.

**Key words:** Chilli, organic, conventional, growth, attribute, economic

## Insect suppressing ability of coir waste based vermicompost in coconut

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### ABSTRACT

The impact of vermicompost on two key pests of coconut viz., eriophyid mite and rhinoceros beetle studied at Odisha University of Agriculture and Technology, Odisha during 2010-11 through 2012-13 revealed that supplementing 50 per cent of recommended fertilizer doses (RDF) with vermicompost @ 50kg<sup>-1</sup> palm<sup>-1</sup> year generated from coir waste with certain admixtures like *Trichoderma* (@ 0.08% w/w), Bio-NPK (@ 0.5% w/w), *Trichoderma* (0.08% w/w) + Bio-NPK (@ 0.5% w/w) and only cow dung, could yield nuts that were free from mite damage up to an extent of 70.8 - 79.6 per cent which was either higher or on a par with that obtained through sole application of RDF (70.9%). Relatively low leaf damage by RB (=11.3%) was also achieved with the above applications.

**Key words:** Vermicompost, coir waste, admixtures, *Trichoderma*, Bio-NPK, Oil cakes

# Influence of manures and biofertilizers on carrot (*Daucus carota* L.) cv. *Early Nantes* growth, yield and quality

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## ABSTRACT

The field experiment carried out to study the effect of organic manures and biofertilizers on the growth, yield and quality of carrot, at experimental farm, Department of Horticulture, Assam Agricultural University, Jorhat during 2008-09, revealed that the combined applications of azotobacter, farm yard manure (FYM), rock phosphate (RP) and phosphate solubilizing bacteria (PSB) improved the root yield and other growth traits viz. root girth, number of functional leaves and stalk weight of carrot. Highest root yield (19.60 t ha<sup>-1</sup>) was obtained under this treatment. However, the application of azotobacter, vermicompost, RP and PSB also improved the yield.

**Key words :** Organic, carrot, yield, quality, FYM, biofertilizers.

# Nutrient supplementation through organic manures for growth and yield of ginger (*Zingiber officinale* Rose.)

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## ABSTRACT

The field experiment conducted to study the effect of nutrients supplementation through organic manures on growth, yield and economics of ginger (*Zingiber officinale* Rose.) during kharif season in 2010-11 to 2012-13 revealed that soil application of organic manures i.e., farm yard manures & vermicompost, recommended dose of chemical fertilizers and integrated nutrient management i.e., organic and inorganic fertilizers showed significant effect on the growth and yield parameters of ginger. However, soil application of FYM-30t ha<sup>-1</sup> N:P:K::80:50:80kg ha<sup>-1</sup> produced the maximum plant height (56.54cm), number of tiller plant<sup>-1</sup>, (35.24), number of leaves tiller<sup>-1</sup> (23.10) and yield (16.10t ha<sup>-1</sup>), giving the maximum net profit of Rs. 4,28,941 or Rs.3.00 per unit cost as compared to other treatments.

**Key words:** Ginger (*Zingiber officinale* Rose.), farm yard manures, vermicompost, inorganic fertilizer i.e., chemical fertilizers.

# Effect of ZnSO<sub>4</sub>, FeSO<sub>4</sub>, CuSO<sub>4</sub> and MnSO<sub>4</sub> on growth, yield and economics of coriander (*Coriandrum sativum* L.) cv.-Pant Haritima

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## ABSTRACT

The field experiment conducted during rabi 2009-10 to 2011-12 to assess the influence of micro-nutrients (zinc, iron, copper and manganese) on growth, yield and economics of coriander at the experimental field of Department of Horticulture, T.C.A., Dholi, Muzaffarpur (Bihar) revealed that none of the micro-nutrients tested showed significant effect on yield and yield attributing characters. However, these applied through soil @25kg ha<sup>-1</sup> as well as through two foliar applications @0.5% at

45 and 60 days after sowing effected significantly as against no application (control). Two foliar application of ferrous sulphate @0.5% at 45 and 60 days after sowing gave the maximum plant height (143.34cm), number of umbel per plant (83.79), number of umbellets per umbel (6.84), number of grains per umbel (48.02), yield (2.71t ha<sup>-1</sup>) and maximum net return of Rs. 66,150 with the maximum benefit: cost ratio of Rs.2.57:1.

**Key words :** Coriander, zinc sulphate, ferrous sulphate, copper sulphate and manganese sulphate.

## **Effect of fertility levels and fertilizer : vermicompost proportions on yield content and uptake of nutrients and economics of baby corn (*Zea mays*)**

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### **ABSTRACT**

The field experiment conducted on baby corn in clayey soil during summer 2010 indicated that the application of 150-75 kg N-P<sub>2</sub>O<sub>5</sub> ha<sup>-1</sup> resulted into production of maximum baby cob yield (2209 kg ha<sup>-1</sup>), green fodder yield (18033 kg ha<sup>-1</sup>), N and P in cob and fodder as well as uptake of N, P and K by cob and fodder at harvest and available N and P in soil after the harvest. The highest net returns (‘ 26502 ha<sup>-1</sup>) and B : C ratio (2.22) were however, obtained with application of 120-60 kg N-P<sub>2</sub>O<sub>5</sub> ha<sup>-1</sup>. Among various proportions of fertilizer and vermicompost, application of 75.0 per cent N through fertilizer and 25.0 per cent N through vermicompost recorded highest green cob yield (2414 kg ha<sup>-1</sup>) and green fodder yield (19389 kg ha<sup>-1</sup>) along with higher content of N and P and uptake of N, P and K by cob and fodder, net return (Rs 31983 ha<sup>-1</sup>). While the highest B : C ratio (2.35) was achieved with application of 100.0 per cent N through fertilizer. Application of fertilizer and vermicompost in 50 : 50.0 per cent proportion registered higher availability of N, P and K in soil after harvest.

**Key words:** Baby corn, Fertilizer, Vermicompost, *Zea mays*

## **Response of oat (*Avena sativa* L.) to nitrogen and phosphorus levels under North Gujarat Agro-climatic conditions**

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### **ABSTRACT**

The field experiment, conducted to evaluate the effect of nitrogen and phosphorus on growth parameters and yield of fodder oat on loamy sand soil at sardarkrushinagar during *rabi* 2011-12 revealed that application of 125 kg ha<sup>-1</sup> nitrogen + 75 kg ha<sup>-1</sup> phosphorus appreciably recorded the highest plant height, leaf length, leaf width, leaf: stem ratio (green and dry), leaf area per plant and leaf area index at first cut, second cut (at harvest) and in the mean values. It also resulted in highest leaf and stem weight (green and dry), green and dry fodder yield per plant and green and dry fodder yield q ha<sup>-1</sup> recorded at first and second cut (at harvest) as well as in the total values.

**Key words:** Oat, Fodder, Nitrogen and Phosphorus

## **Impact of floods on rice based farming in Assam: A Gender Study**

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#### ABSTRACT

The study conducted in Assam under IFAD funded project revealed that the rice growers experienced adverse effects of flood. The production, yield and area under rice decreased leading to reduced food availability. Women played vital role not only in agriculture but also in other allied activities. Any change in rainfall pattern affected farmers of the area. To reduce the vulnerability due to flood adoption of stress tolerant crop varieties, planting of early varieties to avoid crop loss and pest and disease management techniques as an effective technological interventions were suggested. Further, study suggests developing site specific varieties and training programmes on crop production management.

**Key words:** Impacts, floods, rice, farming and gender

## **Biology of *Calepitrimerus azadirachtae* Channa Basavanna (Acari: Eriophyidae) infesting neem, *Azadirachta indica* in Karnataka**

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#### ABSTRACT

The eriophyid mite, *Calepitrimerus azadirachtae* feeding on neem completed its life cycle from egg to adult within  $8.03 \pm 0.81$  days and  $7.65 \pm 0.65$  days for female and male, respectively. Each of the stages viz., egg, protonymph, and deutonymph lasted for  $2.97 \pm 0.33$ ,  $1.27 \pm 0.27$ ,  $1.51 \pm 0.17$  and  $2.68 \pm 0.33$ ,  $1.51 \pm 0.34$ ,  $1.56 \pm 0.25$  days for female and male, respectively. The quiescent-I and quiescent-II stages lasted from  $0.96 \pm 0.16$ ,  $1.32 \pm 0.18$  and  $0.90 \pm 0.14$ ,  $1.07 \pm 0.24$  days for female and male, respectively. The preoviposition periods for females lasted for  $1.65 \pm 0.60$  days, while the oviposition period was of  $7.85 \pm 2.99$  days. The female produced mean of  $25.60 \pm 8.01$  eggs in their life time and post oviposition period lasted for  $1.43 \pm 0.37$  days. The adult longevity for female and male was  $13.45 \pm 2.68$  and  $9.85 \pm 1.89$  days, respectively. Females lived longer than males.

**Key Words:** Eriophyid mite, *Calepitrimerus azadirachtae*, neem, biology

## **Biointensive management of *Helicoverpa armigera* (Hubner) in chickpea**

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#### ABSTRACT

The field experiment conducted at Bihar Agricultural College, Sabour Farm of Bihar Agricultural University, Sabour during the year 2010-11 to 2012-13 revealed that pod borer, *Helicoverpa armigera* on chickpea could effectively be managed through use of pheromone trap + Bt+ HaNPV. Effectiveness of the treatment was also reflected on grain yield which was significantly higher in comparison to other treatments.

**Key words:** *Helicoverpa armigera*, chickpea, Bt, HaNPV

## **Efficacy of entomopathogenic fungi and acaricidal molecules on mite, *Calepitrimerus azadirachtae* Channa Basavanna (Acari: Eriophyidae) on neem**

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#### ABSTRACT

The efficacy of fungi and acaricides was evaluated against the eriophyid mite, *Calepitrimerus azadirachtae* under laboratory and field conditions by using nine treatments. Difenthruron after six days of spraying under laboratory conditions recorded the highest mortality (95.33 %). This was followed by propergite with 93.33 per cent mortality. The next best treatment was fenazaquin (2ml l<sup>-1</sup>) with 90.67 per cent mite mortality. The *Fusarium semitectum* at 2.3 × 10<sup>9</sup> spores ml<sup>-1</sup> and *Hirsutella thompsonii* at 4.6 × 10<sup>8</sup> spores ml<sup>-1</sup> showed 82.0 and 86.0 per cent reduction of mite population. In field condition, 12 days after spraying, the highest mortality was noticed in difenthruron (1.2g l<sup>-1</sup>) followed by propergite (1.5ml l<sup>-1</sup>) and fenazaquin (2ml l<sup>-1</sup>) with 91.96, 87.31 and 84.50 per cent mortality, respectively. The treatment *F. semitectum* at 2.6 × 10<sup>15</sup> spores ml<sup>-1</sup>, *H. thompsonii* at 4.1 × 10<sup>14</sup> spores ml<sup>-1</sup> and *F. semitectum* + dicofol (0.02%) gave 46.09, 55.49 and 54.85 per cent mortality, respectively. Dicofol (2.5ml l<sup>-1</sup>) and wettable sulphur (3g l<sup>-1</sup>) treatments were also effective on mite population registering 78.35 and 68.99 per cent mortality after 12 days of spray.

**Key words:** Entomopathogenic fungi, acaricides, eriophyid mite, *Calepitrimerus azadirachtae*,

## Studies on varietal screening and date of sowing of chickpea [*Cicer arietinum* (L.)] against *Helicoverpa armigera* (Hub.)

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#### ABSTRACT

Investigations on screening of chickpea varieties/genotypes and their dates of sowing on *H. armigera* (Hub.), conducted at Experimental Farm, College of Agriculture, Bikaner, Rajasthan during Rabi season in 2005-06 revealed that the varieties RSG-44 and RSG-945 were rated as highly susceptible followed by CSJ-104, RSG-959, RSG-895, RSG-888, RSG-897 and RSG-973 as moderately susceptible while, CSJD-884 and RSG-931 registered least susceptible reactions. The variety CSJD-884 recorded maximum yield (14.54 q ha<sup>-1</sup>) at par with RSG-931 (14.36 q ha<sup>-1</sup>), while lowest yield was from RSG-44 (11.13 q ha<sup>-1</sup>). The experiment on dates of sowing revealed that early sown crop (5<sup>th</sup> October) harboured the lowest gram pod borer larval population (2.50 larvae five plants<sup>-1</sup>), minimum pod damage (14.50%) and relatively better yield (13.04 q ha<sup>-1</sup>) as compared to late sown (20<sup>th</sup> November) crop having higher larval population (6.13 larvae five plants<sup>-1</sup>), higher pod damage (28.96%) and lower yield (9.77 q ha<sup>-1</sup>).

**Keywords :** Varietal screening, chickpea, *H. armigera*

## Effect of organic manures and biopsticides on the incidence of moth bean pod borer, *Cydia ptychora* (Meyr.)

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#### ABSTRACT

The study on influence of organic manures and biopesticides on the incidence of pod borer of moth bean, *Vigna aconitifolia* revealed that application of neem cake significantly reduces the pod borer damage by changing the insecticidal composition of the host plant. Spray of *Nomuraea rileyi* also recorded reduced incidence of pod borer damage.

Key words: Moth bean, organic manures, biopesticides

## Studies on varietal screening of maize hybrids against stem borer, *Sesamia inferens* (Walker)

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### ABSTRACT

The study conducted on nine hybrids of maize i.e. Allrounder, 900-M-Gold, NAH-2049, Topstar, Topclass, Rajkumar, Bioseed-9544, CP- 818 and CP- 828 for resistance against maize stem borer *Sesamia inferens* (Walker) during *Kharif* 2012 revealed significant differences among hybrids regarding per cent infestation, per cent cob damage, pin holes, dead hearts, weight of stalks and grains. CP- 828 recording lowest of 3.87 per cent infested plants, 3.92 per cent cob damage, 4.04 dead hearts, 13.00 pin holes plant<sup>-1</sup> and maximum of 96.54 q ha<sup>-1</sup> straw and 44.69 q ha<sup>-1</sup> grain yield proved to be the most tolerant variety. Bioseed-9544 with maximum of 13.45 per cent infested plants, 12.99 per cent cob damage, 14.65 per cent dead hearts, 34.64 pin holes plant<sup>-1</sup> and lowest of 59. 51 q ha<sup>-1</sup> straw and 23.87 q ha<sup>-1</sup> grain yield was rated as least tolerant.

**Keywords :** Varietal screening, maize hybrid, stem borer

## Effect of different media and pH regimes on growth and sporulation of *Collatoricum capsici* *in vitro*

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### ABSTRACT

The laboratory experiment conducted to test suitability of different semi-synthetic and synthetic media in solid and liquid state and pH on growth and sporulation of *Collatotrichum capsici* revealed that potato dextrose agar among the semisynthetic and Richard's agar media among the synthetic ones showed highest mycelial growth and its dry weight of 80.00, 77.66 mm and 552.33, 495.66 mg, respectively. As regards the influence of pH, the fungus could grow and sporulate at wide range of pH from 4.0 to 8.0 in liquid medium. The dry mycelial weight was significantly higher at pH 5.5 (282.33 mg) followed by 261.66 mg at 6.0 pH.

**Keywords :** Synthetic and semisynthetic media, pH, growth and sporulation, *C. capsici*

## Integrated weed management in *rabi* sweet corn (*Zea mays* var. *Saccharata*)

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### ABSTRACT

The field experiment conducted during *rabi* 2010-11 at Junagadh (Gujarat, India) revealed that treatments viz., hand weeding (HW) and intercultivation (IC) twice at 15 and 30 days after sowing (DAS), pre-emergence application (PRE) of atrazine @ 0.5 kg/ha + HW and IC at 30 DAS and pendimethalin @ 0.9 kg/ha as PRE + HW and IC at 30 DAS significantly enhanced growth and yield attributes viz., cob length, cob girth, number of cobs per plant, number of kernels per cob, fresh and dry weight of cob leading to higher cob and fodder yields over unweeded check. These treatments

also recorded the lower weed population at 30, 60 DAS and at harvest, dry weight of weed at harvest and weed index as well as higher weed control efficiency and herbicidal efficiency index along with higher net returns and B:C ratio compared to unweeded check.

**Key words :** IWM, sweet corn

## **Compatibility of penoxsulam + cyhalofop with insecticide, fungicide and urea 2% in direct seeded rice**

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### **ABSTRACT**

The field experiment on compatibility of penoxsulam + cyhalotopbutyl with insecticides, fungicides and urea undertaken with the aim of effective management of weeds in direct seeded rice at Norman E. Borlaugh Crop Research Centre of G.B.P.U.A. & T., Pantnagar during *Kharif* 2010 revealed synergistic effect in weed control and rice grain yield. The application of penoxsulam+cyhalofop-butyl at 150 g ha<sup>-1</sup> along with chloropyrifos at 125 g ha<sup>-1</sup>, carbendazim 125 g ha<sup>-1</sup> and urea 2% reduced the dry weight of weeds by 85.0, 82.4 and 82.8 %, respectively compared to weed control.

**Key words:** Compatibility, insecticide, fungicide, fertilizer, direct seeded rice, weeds.

## **Physico-chemical and functional properties of buckwheat (*Fagopyrum esculentum* Moench)**

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### **ABSTRACT**

Physico-chemical and functional properties studied with two buckwheat varieties, the PRB-1 and a local procured from local market at G.B.P.U.A.T., Pantnagar revealed that the variety PRB-1 had higher value of hydration capacity (1.05 g seed<sup>-1</sup>), swelling capacity (1.33 g ml<sup>-1</sup>) and swelling index (0.55) than the local variety. As regards the functional properties, both the varieties differed significantly in water absorption capacity (WAC) and fat absorption capacity (FAC) having the value of WAC (1.60 ml g<sup>-1</sup>) and FAC (1.24ml g<sup>-1</sup>) for variety PRB-1 (P<0.05). The foaming properties of buckwheat flour was found to be a function of pH and the foam capacity and its stability was found inversely related. The PRB-1 variety at pH 4.5 exhibited least foam expansion (120.0 %) but highest foam stability (62 %). The study concludes that buckwheat being suitable for cooking and processing purposes can be used as future health foods.

**Key words:** Buckwheat, Physico-chemical properties, functional properties, foaming properties.

## **Laboratory evaluation of ZiBOC and CCA as an antisapstain on *Populus deltoides***

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### **ABSTRACT**

The efficacy of commercial wood preservatives (copper chrome arsenic (CCA), borax-boric acid and ZiBOC, a recently developed environmental friendly preservative at 1 per cent concentration) in inhibiting fungal (*Alternaria alternata*) discoloration on sapwood of poplar (*Populus deltoides*), assessed by using an accelerated test on samples at 25±2°C and different relative humidity (75±2% and 95±2%), revealed that ZiBOC at both incubation conditions imparted complete protection to the specimens as compared to CCA treated specimens showing slight growth followed by borax boric acid. High humidity promoted the growth of *Alternaria alternata* in borax boric acid treated specimens. Control specimens showed 100 per cent surface coverage on the wood specimens by the sapstain fungi.

**Key words:** Borax-Boric acid, sapstain, *Alternaria alternata*, *Populus deltoides*, CCA, ZiBOC.

## Role of potato tuber size and varieties on tuber rotting in storage under ambient condition

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### ABSTRACT

The three years study on the role of tuber size and varieties on rotting under storage conditions conducted with three popular potato varieties of the state, i.e. Kufri Chandramukhi, Kufri Jyoti and Kufri Ashoka revealed minimum rotting in Kufri Chandramukhi of 40- 50g weight followed by 50 to 70g of the tuber against maximum in 101 to 150 g tuber of the variety Kufri Ashoka.

**Key words:** tuber size, varieties, potato, rotting, ambient condition.

## Biology of maize stem borer, *Sesamia inferens* (Walker) Noctuidae: Lepidoptera

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### ABSTRACT

The biology of maize stem borer, studied under laboratory conditions during September to January 2012 at College of Agriculture Navile, Shimoga, revealed that the stem borer completed its life cycle in 35 to 57 days. The incubation period ranged from 5 to 6 days. The larval stage passed through six instars. The mean duration of I, II, III, IV, V and VI instar was of 3.85± 0.74, 3.50± 1.05, 4.95± 0.82, 5.50± 1.14, 6.05± 0.75 and 7.10± 1.29 days, respectively. The total larval period ranged from 23 to 39 days. The pre-mating and mating period occupied 8.23± 0.94 and 4.45± 0.86 hours, respectively, oviposition period occupied 5.00± 1.49 days. The stem borer had the fecundity rate of 120- 348 eggs. The adult male and female lived for 3 to 5 and 5 to 7 days with a mean of 4.40± 0.75 and 6.10± 0.78 days, respectively.

**Keywords :** Biology, *Sesamia inferens*

## Seasonal incidence of *Raoiella indica* Hirst on arecanut in shimoga

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### ABSTRACT

Studies on seasonal incidence of mite, *Raoiella indica* Hirst on arecanut carried out at college of Agriculture, Shimoga during 2011-2012 revealed that the activity of



*Raoiella indica* occurred throughout the year, the higher incidence being noticed in April and May and the lower during July to January. The mite incidence was observed more on the lower portion of the frond than on the middle and top frond. The population was positively correlated with temperature and negatively with relative humidity, whereas with rainfall the relation was non-significant.

**Keywords :** *Raoiella indica*, arecanut

## Host preference of *Raoiella indica* Hirst to different areca cultivars

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### ABSTRACT

Host preference of *Roiella indica* to six different areca cultivars studied during 2011-12 revealed insignificant mite preference to varieties. However, the cultivar Thirthahalli recorded highest number of mites (1900.00 plant<sup>-1</sup>) while Sreemangala the lowest (400.00 plant<sup>-1</sup>) after eight weeks of the release.

**Key words :** Host preference, *R. indica*, areca cultivars

## *In vivo* screening of blackgram genotypes/varieties against anthracnose disease

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### ABSTRACT

Field screening of blackgram varieties for resistance against anthracnose disease carried out at Pulse Research Station, NAU, Navasari, Gujarat during 2008 revealed that varieties Tq and TPU-4 registering minimum disease infection showed resistant reactions, while eight germplasm viz.; SKNU (21.11 %), KU-09 (12.22 %), UB-7 (5.56 %), UB-10 (14.44 %), UB-12 (17.78 %), UB-13 (18.89 %), UB-14 (16.67 %) and UB-18 (7.78 %), were found to be moderately resistant.

**Keywords:** Screening, blackgram, anthracnose disease

## Molecular characterization of mycoparasite, *Tuberculina* sp. on *Nyssopsora thwaitesii* (Berk. & Broome) Syd.

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