INSECTICIDES (incl. Fungicides, Herbicides, Nematicides, Larvicides, etc.)

NPARR 3(4), 2012-0383 Pre and post emergence herbicides for weed control in castor crop

Weed management is among the main factors limiting cultivation of castor (Ricinus communis) in extensive fields, particularly when labor is scarce or expensive. This experiment evaluated the efficiency of weed management programs using preemergence (clomazone, pendimethalin, and trifluralin) and a postemergence herbicide (chlorimuron-ethyl) applied at 20 days after emergence in castor plants cv. BRS Energia under rainfed conditions in Apodi, Brazil. No phytotoxicity was observed on the castor plants, and the postemergence herbicide significantly increased castor seed yield to 1466 kg ha\(^{-1}\) complementing the weed control of preemergence herbicides treatments in which seed yield was 1207 kg ha\(^{-1}\). Seed yield on weedy and weed-free treatments was 760 and 1971 kg ha\(^{-1}\), respectively. Weeds were kept under a satisfactory control up to 40 days after emergence. This program resulted in reasonable weed control because the preemergence herbicides controlled monocotyledon weeds, while the postemergence [Valdinei Sofiatti Liv S. Severino*, Franklin M.O. Silva, Vivianny N.B. Silva and Giovanni G. Brito (Texas Tech University, Dep. Plant and Soil Science, Lubbock, TX 79409-2122, United States), Industrial Crops and Products, 2012, 37(1), 235-237].

NPARR 3(4), 2012-0384 Laboratory evaluation of the effect of Khaya senegalensis and Cassia occidentalis ethanolic leaves extracts against worker termites (Isoptera: Rhinotermitidae) on treated wood sample

Khaya senegalensis and Cassia occidentalis ethanolic leaves extract were evaluated for their effectiveness to suppress wood damage by termite at the Department of Biological Sciences, Bayero University, Kano, Nigeria. K. senegalensis was collected from Nana hall female hostel, old campus of Bayero University Kano, and C. occidentalis was collected from wild areas of Aminu Kano Teaching Hospital Zaria Road, Kano. Both plants were identified at the herbarium of the Department of Biological Sciences. The leaves were extracted using Soxhlets extraction method. Termite was collected at Bayero University quarters, new site and identified using taxonomic key. Wood sample used for the bioassay were collected from a carpenter shop at Tarauni Local Government Kano and was disinfested by drying in an oven at 60°C overnight. Bioassay was conducted in plastic containers. Extracts from these plants were separately prepared into different concentration (0.5, 1.0 and 1.5 g) and inoculated into separate plastic containers containing 20 g of disinfested wood sample which correspond to 2.5, 5.0 and 7.5% w/w, respectively. Forty (40) workers termite were introduced into these containers separately. Control treatment was set along. Each treatment was replicated three times; mortality of the insect was assessed after 24 h interval. This study indicated that both C. occidentalis and K. senegalensis ethanolic extracts at varying level of application recorded mortality of the workers termite within the shortest duration of application when compared with the untreated wood. 100% mortality of workers termite was observed on wood treated with C. occidentalis extract at all level of application after 120 h of treatment while 100% mortality of the workers termite was recorded on wood treated with K. senegalensis at all level of application after 240 h of treatment. This indicated that extract of C. occidentalis was more effective than the extract of K. senegalensis in killing workers termite on wood treated with the extract [N. Abdullahi*, S. Yahya, M. Yushau and Z. Tukur (Department of Biological Sciences, Bayero University, Kano, Kano State,
INSECTICIDES


NPARR 3(4), 2012-0385 Management of Macrophomina wilt in melons using grafting or fungicide soil application: Pathological, horticultural and economical aspects

Melon cultivation in the Yizre’el Valley of northern Israel is threatened by plant wilting that occurs toward harvest. *Macrophomina phaseolina* is the most common fungus isolated from the wilted plants. Disease management using grafted plants or soil application of fungicides to non-grafted melons during the growing season was studied. For the grafting experiments, two Ananas-type melons (*Cucumis melo* L.), cv. 6405 and Eyal, were grafted onto interspesific F$_1$ *Cucurbita* rootstock TZ-148 and transplanted at spacings of 60, 90, 120 and 180 cm within rows in *M. phaseolina* infested soil to test their ability to cope with the disease and to evaluate the profitability of grafted plant cultivation at different spacings. Grafted plants did not wilt, compared to 80 and 70% wilting of non-grafted melon plants in experiments conducted in 2006 and 2008, respectively. Cultivation of grafted melons in infested soil for the local market was shown to be profitable, even with a 50% reduction in transplant number for a given area (120 cm between transplants). In addition, selection of the right melon cultivar as scion was shown to be crucial to the success of the crop. In another set of experiments conducted in summer 2010 with non-grafted melon plants, application of the fungicides azoxystrobin alone or combined with chlorothalonil or medenoxam reduced disease incidence to 5% as compared to 45% in the untreated control. Disease management using both cultural and chemical approaches is discussed [Ron Cohen’Nabil Omari, Asaf Porat and Menahem Edelstein (Department of Plant Pathology, Institute of Crop Protection, A.R.O., The Volcani Center, Newe Ya’ar, P.O. Box 1021, Ramat-Yishay 30095, Israel), Crop Protection, 2012, 35, 58-63].

NPARR 3(4), 2012-0386 Effect of phenolic acids from black currant, sour cherry and walnut on grain aphid (*Sitobion avenae* F.) development

The influence of naturally-occurring phenolic acid mixtures from selected plants was tested against the grain aphid (*Sitobion avenae* F.). Phenolic acids were extracted from the leaves of black currant (*Ribes nigrum* L.), sour cherry (*Prunus cerasus* L.) and walnut (*Juglans regia* L.), as well as from the green husks of walnut. The highest content of total phenolic acids and individual compounds such as *p*-hydroxybenzoic, *p*-coumaric, chlorogenic and vanillic acids were determined in *J. regia*. Ferulic and tannic acids were found only in *J. regia*. In laboratory bioassays, the phenolic acids extracted from plants prolonged the aphid prereproductive period by 1.5-3.0 days and reduced daily fecundity by 1-1.5 offspring. The strongest effects were observed after application of phenolic acids from the leaves and green husks of *J. regia*. The grain aphid used glutathione S-transferase (GST), peroxidase (POD) and polyphenol oxidase (PPO) in response to the application of plant phenolic acids. An increase in aphid GST activity was found in response to treatment with all extracts. Induction of PPO and POD was shown 24 h after the application of phenolic acids mixture from leaves of walnut; inhibition was observed after 48 and 168 h in response to treatment with both extracts of walnut. An inverse relationship between the POD and PPO activity of the aphids was found 24 h after application of the black currant and sour cherry phenolic acids. After 168 h, the activities of these enzymes were higher in treated aphids compared to unsprayed insects. Mixtures of phenolic acids naturally occurring in phenol-rich plants might be used as biopesticides to control the grain aphid as a part of an integrated pest management programme [Grzegorz Chrzanowski, Bogumił Leszczyński*, Paweł Czerniewicz, Hubert Sytykiewicz, Henryk Matok, Robert Krzyżanowski and Cezary
An antagonist yeast strain, WY-1, was identified using 18S and internal transcribed spacer (ITS) 1-5.8S-ITS2 rDNA region sequences. The 18S and ITS1-5.8S-ITS2 rDNA sequences of this yeast strain were amplified and sequenced using the universal primer pairs NS1/NS8 and ITS4/ITS5. The ITS1-5.8S-ITS2 rDNA sequence and 18S neighbor-joining tree showed that WY-1 was a strain of Cryptococcus albidus. The biocontrol activity of C. albidus WY-1 on postharvest decay of radishes caused by Alternaria spp. and Fusarium spp. was investigated. In vitro, at $10^8$ CFU ml$^{-1}$ C. albidus WY-1 inhibited the mycelial weight increases of Alternaria spp. and Fusarium spp. by 45.3% and 59.6%, respectively. In vivo, infection incidence and lesion development of radish decay were suppressed by the application of C. albidus WY-1 at $10^8$ CFU ml$^{-1}$. After 6 days of incubation at 20°C or 24 days at 4°C, disease incidences were 2.8% and 1.4%, respectively; however, the disease incidences of control fruit were 98.6% and 87.5% under these incubation conditions, respectively. Application of C. albidus WY-1 and the chemical fungicide thiabendazole were statistically just as effective. Finally, C. albidus cell counts around inoculation sites remained high at 4°C even 32 days after inoculation ($6.7 \times 10^5$ CFU per cm$^2$). [Xiuiling Chen, Jingfu Li, Lili Zhang, Xiangyang Xu, Aoxue Wang, Yijun Yang (College of Life Science, Northeast Agricultural University, Harbin, Heilongjiang Province, 150030, PR China), Crop Protection, 2012, 41, 88-95].

**NPARR 3(4), 2012-0389** *Antibacterial activity of plant extracts obtained with alternative organics solvents against food-borne pathogen bacteria*

The objectives of this study were: the chemical characterization of extracts from seven plants (Larrea tridentata, Flourensia cernua, Lippia graveolens, Agave lechuguilla, Yucca filifera, Opuntia ficus-indica, and Carya illinoensis) which are acclimated to the Mexican semi-desert. The extracts were obtained using...
Soxhlet method by water, ethanol and an infusion method using alternative organic solvents (lanolin and cocoa butter), in addition it was evaluated the antibacterial activity of semi-desert plant extracts against Enterobacter aerogenes, Escherichia coli, Salmonella typhi and Staphylococcus aureus. Chemical characterization of plant extracts showed that they are rich in secondary metabolites; cocoa butter was the non-conventional solvent which it was possible to obtain the highest content of total tannins. It was not possible to identify saponins in those extracts where non conventional solvents were used. While in extract where non conventional solvents were used, it was only possible to detect the presence of terpenes in creosote bush and prickly pear extracts. S. aureus was the bacterial strain that showed the highest growth inhibition as consequence of the plant extracts. The use of semi-desert plant extracts obtained using organic solvents are a good alternative for food-borne pathogen bacteria control because all the bacterial growth decreased with the tested extracts. [Martha Mendez, Raúl Rodríguez*, Judith RuizDiana Morales-Adame, Francisco Castillo, Francisco D. Hernández-Castillo, and Cristóbal N. Aguilar (Department of Food Research, School of Chemistry, Universidad Autónoma de Coahuila, 25000 Saltillo, Coahuila, Mexico), Industrial Crops and Products, 2012, 37(1), 445-450].

NPARR 3(4), 2012-0390 Control of foliar diseases of tea with Xanthium strumarium leaf extract

Tea industry forms the backbone of economy in the sub-Himalayan agro-climatic region of north east India where it is normally grown extensively in large plantations. The study was aimed to develop a bio-rational alternative to the harmful chemical fungic peace for controlling foliar fungal diseases which limit tea production. An antifungal compound from benzene extract of adult leaves from Xanthium strumarium L. was purified and characterized and the in vitro antifungal activity was evaluated against a broad spectrum of plant pathogens. The sesquiterpene lactone which was purified by bioassay guided fractionation using repeated column chromatography and thin layer chromatography was identified as xanthatin by ultraviolet, infrared and nuclear magnetic resonance spectroscopic analysis. The minimum inhibitory concentration of the isolated compound tested by microdilution method ranged from <0.0097 to 0.325mgml⁻¹ against 8 tea pathogens and 12 other plant pathogens. The most susceptible fungi were Colletotrichum camelliae, Curvularia eragrostidis and Rhizoctonia solani among tea pathogens and Colletotrichum gloeosporioides, Fusarium moniliforme and Rhizopus stolonifer among other tested pathogens. Subsequently the in vivo antifungal activity was tested in detached leaves against four foliar tea pathogens, C. camelliae, C. eragrostidis, Lasidiplodia theobromae and Pestalotiopsis theae. The purified compound completely inhibited lesion development at 0.1 mg ml⁻¹ concentration against C. camelliae and C. eragrostidis. The purified compound and the crude extract were further tested for their ability to control foliar diseases in young tea plants of two clonal varieties, TV-18 and TV-30 in the greenhouse. The water insoluble extracts emulsified in water effectively controlled brown blight (C. camelliae), leaf spot (C. eragrostidis), grey blight (P. theae) and leaf blight (L. theobromae). Highest percentage efficacy of disease control was exhibited against leaf spot followed by brown blight. The disease control efficacy was comparable to the fungicide bavistin. The results show that the adult leaves of X. strumarium may be used as a source of botanical fungicidal preparation for controlling foliar fungal diseases of tea [Dipanwita Saha*, Ramashish Kumar, S. Ghosh, M. Kumari, Aniruddha Saha (Department of Biotechnology, North Bengal University, Dist. – Darjeeling, Siliguri-734013, India), Industrial Crops and Products, 2012, 37, (1), 376-382].