

**ĐÁNH GIÁ TÍNH ĐA DẠNG DI TRUYỀN CỦA VI KHUẨN CANDIDATUS
LIBERIBACTER ASIATICUS, TÁC NHÂN GÂY BỆNH HUANGLONGBING TRÊN
CÂY CÓ MÚI BẰNG MARKER SSR Ở VÙNG ĐỒNG BẰNG SÔNG CỬU LONG**
*Genetic diversity of Candidatus liberibacter asiaticus, the causal agent of Huanglongbin
disease on citrus by SSR marker in the Mekong Delta region*

*Bùi Thị Ngọc Lan, Nguyễn Hải Bằng, Hồ Mỹ Tú,
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SUMMARY

Huanglongbing (HLB), previously known as citrus greening is a destructive disease of citrus. The causing pathogens are believed to be phloem-restricted. Using the recently sequenced whole genome of 'Can. L. asiaticus' (Las), we conducted genome wide search to identify simple sequence repeat (SSR) sequencing loci and developed multi-locus SSR marker system for Las genotyping and genetic analyses. Twenty three loci were identified which contain various types of repeat motif potentially suitable for SSR primer design. Among them, 9 SSR primers were developed for genetic diversity analysis of HLB and four highly polymorphic SSR loci were detected. Nei's measure of genetic diversity value of 107 isolates of Las collected in the Mekong Delta ranged from 0.167 to 0.245. Cluster analyse of genetic distance was not correlated with geographical origins and with plant hosts of the isolate.

**ĐIỀU TRA, ĐÁNH GIÁ SỰ PHÂN BỐ VÀ TUYỂN CHỌN CÁC GIỐNG
SÀU RIÊNGỞ NAM BỘ**

Review, evaluation of the distribution and selection durian in the Southern

Hoàng Văn Hiệu, Phạm Thị Mươi và Mai Văn Trị

SUMMARY

In nature many durian has one or more of the best characteristics of productivity, quality and disease resistance. So the "Investigation, assessment and distribution of selected varieties of durian in the South" was conducted. Surveys were conducted in the region and some southern Central Highlands, the period of investigation be conducted from June - 12/2011. The results obtained total 40 individual high-yield, good quality and the individual is mainly propagated by seed (72.5%) and grown mainly in the provinces of Tien Giang, Ben Tre, Dong Nai and Lam Dong. In the beginning there were four individual record is excellent: SRDN01, SRDN05, SRLD09, SRTG10. All 40 individuals were collected and grafted on the grid at the research center fruit Southeastern. After 2 months of transplantation, suggesting that the seedlings are growing, well-developed (average height from 17 to 26 cm) and not infected with diseases.

KHẢO NGHIỆM CÁC DÒNG THANH LONG CÓ TRIỀN VỌNG TẠI TỈNH BÀ RIA - VŨNG TÀU

The trials on prospects clones of dragon at Ba Ria - Vung Tau province

Nguyễn Thị Liên, Phạm Thị Mười và Trần Thị Oanh Yến

SUMMARY

The trials on prospects varieties/clones of dragon at Ba Ria - Vung Tau province were carried out from July 2009 to October 2011 for comparison between 11 promising hybrid clones and two local varieties, white flesh BT and Red flesh LD1, at Ba Ria - Vung Tau province. The results during 27 months for VCU indicated that 11 clones and 2 varieties having good growth, less to much pests and diseases infected and bearing. Among them, T9 (coded name: H14 xCG-005) showed best advantageous characters such as good in fruit skin colour and bracts; firmness, medium juiciness and pinkish purple colour in fruit flesh as comparison to 'Red flesh LD1' variety. Beside of these, this clone also produced high in fruit yield and had been effected at low to medium pests and diseases, especially in anthracnose disease.

ĐÁNH GIÁ CÁC DÒNG XOÀI CÁT HÒA LỘC XỬ LÝ ĐỘT BIẾN VÀ DÒNG XOÀI LAI

Hồ Thị Ngọc Hải, Đào Thị Bé Bảy và Trần Thị Oanh Yến

SUMMARY

Cat Hoa Loc mango is one of the famous mango cultivars in fruit quality of Vietnam. However, it has thin fruit peel and low productivity,... To improve these characteristics, two breeding methods were applied: traditional hybridization and inducing mutants by gamma rays. In traditional hybridization, 235 hybrid individuals were produced from four crosses between 'Vandyke', 'Tommy Atkin', 'Irwin' (as mother materials) with 'Cat Hoa Loc' mango (as father materials). Hybrids were grown at SOFRI' farm from 2005. Up to 2011, only 18 hybrid individuals were evaluated in fruit quality, one of them with coding XL-049, showed thick fruit skin 1.5mm and good quality during 2 years of evaluation.. In inducing mutations by gama rays with dosages as 3.0, 3.5, 4.0, 4.5 and 5.0 Krad on 'Cat Hoa Loc' mango scions, Results showed 18 evaluated individuals had not any changes in fruit quality and peeling thickness.

KẾT QUẢ NGHIÊN CỨU BIỆN PHÁP NHÂN GIỐNG MÍT MĐ06

Research result on breeding techniques of MĐ06 Artocarpus cultivar

Nguyễn An Đệ, Phan Văn Dũng và Bùi Xuân Khôi

SUMMARY

Three experiments about breeding techniques of MĐ06 Artocarpus cultivar was implemented from September 2009 to September 2011 in Ba Ria Vung Tau province.

Experiment 1 “Study on some type grafting of MĐ06 Artocarpus cultivar”: A Randomized complete experiment was designed with 5 treatments (as 5 types grafting), 4 replications, 10 trees per plot. The results showed that grafter type letterpress pix window H for best result than remaining treatments.

Experiment 2 “Study on some sympodial age of MĐ06 Artocarpus cultivar” A Randomized Complete experiment was designed with 5 treatments (as 5 sympodial age), 4 replications, 10 trees per plot. The results showed that grafter type letterpress pix window H with sympode for 14-20 months age for best result than remaining treatments.

Experiment 3 “Study on some afforestation compound for sympodial” A Randomized Complete experiment was designed with 4 treatments (as 4 afforestation compounds for sympodial), 5 replications, 10 trees per plot. The results showed that afforestation compound for sympodial inclusion red soil, compost and fibrous of fruit of coco-nut tree according to proportion 2:1:1 for best result than remaining treatments.

ẢNH HƯỞNG CÁC DẠNG PHÂN ĐẠM VÀ THỜI ĐIỂM BÓN PHÂN ĐẠM ĐẾN NĂNG SUẤT VÀ HÀM LƯỢNG NITRATE TRONG QUẢ DỨA QUEEN

Effect of fertilizer types and application stages of nitroge on the content of nitrate in Queen pineapple

Nguyễn Trịnh Nhất Hằng và Nguyễn Minh Châu

SUMMARY

The present study on the effect of fertilizers types and application stage of nitrogen on the content of nitrate in Queen pineapple has been carried out at Tan Phuoc district, Tien Giang province. The results indicated that application of inorganic fertilizer Urea+DAP at stage 7 and 15 days before fruit harvesting were increased nitrate (18,25mg/l - 26,02 mg/l) content in fruit over limiting standard. There were not significant differences in the fruit yield among stages of application such as 7, 15, 30, 40, 60 days before harvesting. High nitrogen rates were applied at stage 7 days before fruit harvesting due to increased nitrate residue on pineapple fruit.

ẢNH HƯỞNG CỦA NỒNG ĐỘ NAA ĐẾN KHẢ NĂNG ĐẬU QUẢ VÀ NĂNG SUẤT CỦA CHÔM CHÔM JAVA

Effect of NAA concentration on fruit set and yield of Java rambutan

Nguyễn Ngọc Long và Nguyễn Hữu Hoàng

SUMMARY

The present study effect of NAA concentration on fruit set and yield of Java rambutan was implemented at Ben Tre province. A randomized complete block designed with 5 treatments (as 5 concentration NAA), 4 replications, 1 tree per plot. The results showed that application of

30ppm NAA increased significantly difference on fruit set, yield and economic efficiency compared to control.

NGHIÊN CỨU XÂY DỰNG CÔNG THỨC PHÂN BÓN TRÊN CÂY CHÔM CHÔM JAVA CHO NĂNG SUẤT VÀ PHẨM CHẤT TỐT

Nguyễn Ngọc Long và Nguyễn Hữu Hoàng

SUMMARY

Rambutan (*Nephelium lappaceum* L.) has itself specific demand on nitrogen and potassium which is different to other fruit crops. The present study was carried out at Ben Tre province. The result shown that the treatment of application of 5kg microorganism composted manure/plant in combination with 700gN-800gN + 1120-1280gP₂O₅ + 1120-1280gK₂O had higher fruit yield of 104.1-114,4 kg/plant and Brix % of 19,32 -19,69%. However the treatment with 5kg microorganism composted manure/plant in combination with 700gN + 1120g P₂O₅ + 1120g K₂O + 800g CaO) had higher economic efficiency.

KẾT QUẢ NGHIÊN CỨU CÁC LOẠI BAO TRÁI CHO MÍT MĐ06 TẠI MIỀN ĐÔNG NAM BỘ

Research result on some kinds of satchel for defence fruit on MĐ06 Artocarpus cultivar in the Southeast region

Nguyễn An Đệ, Lê Đại Hiền và Bùi Xuân Khôi

SUMMARY

Experiment “Research result some kind satchel for defence fruit on MĐ06 Artocarpus cultivar” was implemented from February 2010 to September 2011 in Dong Nai province. A Randomized Complete Block experiment was designed with 4 treatments (as 4 kinds satchel), 5 replications, 2 tree per plot. The results showed that P.E and oil-paper for defence fruit make reduce significantly difference pests compared to control.

NGHIÊN CỨU MỨC TỈA THƯA QUẢ THÍCH HỢP NHẪM NÂNG CAO HIỆU QUẢ SẢN XUẤT CHO CÂY NA (MĂNG CÀU TA) TRÊN VÙNG SẢN XUẤT NHỜ NƯỚC TRỜI Ở ĐÔNG NAM BỘ

*Study on appropriate level of fruit thinning for sweetsop (*Annona squamosa* L.) grown under rainfed condition in the Southeast region of Vietnam*

Vũ Thị Hà, Nguyễn Văn Thu, Nguyễn An Đệ, Mai Văn Trị và Bùi Xuân Khôi

SUMMARY

The experiment was conducted to define the appropriate level of fruit thinning for sweetsop (*Annona squamosa* L.) grown on grey soil (acrisols) under rainfed condition in the southeast

region of Vietnam during two crops of 2009 and 2010. The 5-year sweetsop trees with spacings of 3 x 4 m were fruit-thinned and leaved amount of 60; 50; 40; 30; and 20 fruits per tree and compared with the control non-fruit thinning. Small, damaged or malformed fruits on clusters were thinned to leave one fruit per each. The result revealed that fruit thinning increased significantly size, weight and flesh proportion of fruit. Thinning and leaving amount of 50 fruits per tree was the best in term of the economical profit.

NGHIÊN CỨU XỬ LÝ RA HOA SỚM NHẪM NÂNG CAO HIỆU QUẢ SẢN XUẤT XOÀI TRÊN VÙNG SẢN XUẤT THIẾU NƯỚC TƯỚI Ở MIỀN ĐÔNG NAM BỘ

Early fruit production for mango 'Buoi' to improve growers' income in the areas of water scarcity in the Southeastern region of Vietnam

Lê Thị Chung, Nguyễn An Đệ, Mai Văn Trị, Bùi Xuân Khôi

SUMMARY

The experiment was aimed to develop practices package for early production to promote the income of mango growers in the areas of water scarcity of the southeastern Vietnam. Forty healthy ten-year-old mango trees c.v. 'Buoi' were selected and laid out in a RCB design with five treatments, four replications and eight trees per each treatment. PBZ was soil drenched as the young leaf reached the 15-day; 30-day; 45-day and 60-day stages and compared to untreated trees as the control. The results revealed that application of PBZ promoted earlier flowering 80 days than as compared to the untreated trees. Additionally, number of flower cluster per tree; number of fruit per tree, fruit weight and yield increased significantly as compared to the control. PBZ application at 45-day-old young leaf was the best in term of economical profit.

ẢNH HƯỞNG CỦA BIỆN PHÁP QUẢN LÝ VƯỜN KHÁC NHAU ĐỐI VỚI KHẢ NĂNG TÁI NHIỄM BỆNH VÀNG LÁ GREENING

Effect of different methods of orchard managements on reinfection of Greening disease

(Huanglongbin)

Đỗ Hồng Tuấn

SUMMARY

*The study was conducted during the time of January to December 2011, at Hòa Hiệp - Tam Bình district - Vĩnh Long province, and Mỹ Lương - Cái Bè district - Tiền Giang province and SOFRI farm in order to reduce the reinfection of Greening disease in King mandarin orchards by (1) selecting the planting date of the free-disease seedlings, (2) applicable prevention of *Diaphorina citri* Kuwayama (RCC) and thinning for management of uniform flushes. Applying of agronomy and plant protection practice on citrus. Results showed that the orchards planted in October of the year was not infection of Greening disease yet and sustained the lowest RCC*

infestation because its density fluctuation was usually at low levels from October to December of the following year. For this reason, in October was a suitable time to planting citrus free-disease seedlings to prevent damage of psyllids pressure and transmission of pathogen for trees after planting. Yellow sticky traps should be set-up in citrus orchard for forecast, when psyllids were found on trap, the managements should be carried out to prevent the pathogen transmission. To combine King mandarin intercropping with seedless guava or King mandarin intercropping with Xá Ly guava and applying systemic insecticide by watering Confidor 100SL solution in the area of 10cm around the tree base by turns of two months and thinning for management of uniform flushes. Two demonstrations were done in early of November 2010 and trees in both treatments after planting 14 months weren't infected Greening disease yet. This application was high effect when applying to citrus orchard was planted by free-disease seedlings in severely infested areas to prevent infectious disease after planting. As a result, applying was practiced on both treatments could recommend and apply on citrus farm to reduce infestation Greening disease after planting.

**NGHIÊN CỨU QUI LUẬT PHÁT SINH PHÁT TRIỂN VÀ TỶ LỆ RẦY CHÔNG CÁNH
DIAPHORINA CITRI KUWAYAMA MANG MÀM BỆNH TRONG NĂM**

***Study on the population and ratio of psyllids Diaphorina citri Kuwayama carrying the
Huanglongbin pathogen through the year***

Đỗ Hồng Tuấn

SUMMARY

The study was conducted from January to December 2011, at Mỹ Lương, Mỹ Lợi A and Mỹ Đức Tây villages - Cái Bè district - Tiền Giang province; Hòa Hiệp and Mỹ Thạnh Trung villages - Tam Bình district - Vĩnh Long province, Quới Sơn village - Châu Thành district and Tân Phú Tây village - Mỹ Xuyên district - Bến Tre province in order to check the population and ratio of psyllids Diaphorina citri Kuwayama carrying Huanglongbin (HLB) pathogen in the year with the aim to prevent the new transmission of citrus HLB pathogen to new nearby planted citrus free-disease seedlings. Results showed that the highness or lowness of psyllids population was dependent on different citrus areas but its density was usually at low levels from October to December. So from October to December may be suitable time for planting of citrus free-disease seedlings instead of planting during April to July as earlier. Psyllids density was very high in April and July, yellow sticky traps should be set-up in citrus orchard for forecast. Therefore, seedlings shouldn't be planted in this time because of psyllids damage. Psyllids population was usually increased before the number of shoots increase a large number of uniform length from 3cm to 5cm. As a result, selection of period for application insecticide was very important on citrus orchard. Psyllids density from April to September at Mỹ Thạnh Trung and Hòa Hiệp village - Tam Bình district - Vĩnh Long province, Mỹ Đức Tây and Mỹ Lợi A - Cái Bè district -

Tiền Giang province were the highest. The period of high psyllids was happening at Hòa Hiệp village. The time from April to May and July to September were two periods happening the highest density of psyllids in the year. Psyllids population was lowest at Tân Phú Tây village - Mỏ Cày district and Quới Sơn village - Châu Thành district - Bến Tre province.

KẾT QUẢ BƯỚC ĐẦU NGHIÊN CỨU PHỤC HỒI VƯỜN BƯỞI DA XANH NHIỄM BỆNH VÀNG LÁ GREENING BẰNG CHẤT KHÁNG SINH

Primary results of rehabilitation of “Da xanh” pomelo greening infected orchard by chemo-trunk injection

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SUMMARY

In Vietnam, greening disease has devastating effect on commercial citrus production in many regions of Mekong Delta since it has been spread in the last few decades. In recent years, efforts to contain the impact of the disease and its spread have involved by apply many technologies to citrus growers. Many reports proved that the use of antibiotic injection as a means of rehabilitating HLB-infected trees was one of the options being explored.

An on-going trial is being carried out to study the impacts of antibiotic - trunk injection on da xanh pomelo greening infected orchards. The results showed that either treatment of thrice time apply of Tetracycline solution at 2 weeks interval after fruit harvest or twice applications of Tetracycline followed by one more time of Penicillin application at 2 weeks interval which could reduce disease intensity of more than 80% on young shoots.

Keywords: HLB, bưởi da xanh, Tetracycline, Penicillin, kháng sinh, etc.

NGHIÊN CỨU TUYẾN TRÙNG *Pratylenchus* spp. GÂY THỐI RỄ TRÊN CÂY CAM SÀNH

Study on *Pratylenchus* spp. caused by root rot disease of king mandarin

Đặng Thùy Linh, Lê Thị Tường, Võ Minh Mẫn, Nguyễn Huy Cường,
Huỳnh Thanh Lộc và Nguyễn Văn Hòa

SUMMARY

Root rot disease of king mandarin had been becoming a major threat and was caused unsustainable citrus orchards in Mekong Delta. Survey results showed root rot disease was common on King mandarin in Cai Be (Tien Giang), Tra On and Tam Bình (Vinh Long); and cortical cracking of main root was first record from 38,1% to 50% orchards in three districts.

Results of nematode extraction showed *Pratylenchus* spp. presence on nine per ten communes in Cai Be, Tam Binh and Tra On districts. The average density of *Pratylenchus* spp. in one gram of roots was the highest in the orchards belong to Loan My commune (353 nematodes / g root) and then Hoa Hiep commune (252 nematodes / g root) and. In 200 ml soil, the highest density of *Pratylenchus* spp. 1258 nematodes/g root (Ngai Tu commune). In the greenhouse tests, nematodes *Pratylenchus* spp. caused symptoms of tap root rot with density of 10 nematodes / pot after 3 months of inoculation. Growth and development of *Citrus volkameriana* in inoculative treatments were severely reduced overtime of inoculation and gradually increase the density of inoculative nematode.

Keywords: *Pratylenchus* sp. nematode, root rot, greenhouse, *Citrus volkameriana*.

KHẢO SÁT TÁC NHÂN GÂY BỆNH VÀNG LÁ THỐI RỄ TRÊN CÂY CÓ MÚI Ở ĐỒNG BẰNG SÔNG CỬU LONG

Result of studying the causal agent of rot root disease on citrus in Mekong Delta

Nguyễn Ngọc Anh Thư, Đỗ Ái My, Nguyễn Thành Hiếu và Nguyễn Văn Hòa

SUMMARY

Root rot is a serious disease on fruit tree, especially on citrus in the Mekong Delta. Appreciating pathogenic ability of 18 strain fungi were isolated from Mekong Delta on chanh tau lemon, among them 8 strains could cause serious disease. Result on the pathogenic ability study of 8 strains on citrus volkameriana shown that two isolates Phy-Q-TG3 (*Phytophthora palmivora*), and F-CS-TG11 (*Fusarium solani*) were the causal agents of citrus rot root disease. Result of studying identification of the causal agent rot root in the greenhouse shown serious disease symptoms when they were inoculated in combination between *Phytophthora* and *Fusarium* or inoculating of F-CS-TG11 (*Fusarium solani*) strains associated with flooding conditions, but when inoculating of each individual was not caused serious disease symptoms.

Keywords: Root rot disease, *Phytophthora*, *Fusarium*, strain, isolate.

ĐÁNH GIÁ TÍNH CHỐNG CHỊU BỆNH VÀNG LÁ GREENING TRÊN MỘT SỐ GIỐNG CÂY CÓ MÚI THÔNG QUA LÂY NHIỄM NHÂN TẠO BẰNG RẦY CHỖNG CÁNH (*Diaphorina citri* Kuwayama) (HEMIPTERA: PSYLLIDAE) TRONG ĐIỀU KIỆN NHÀ LƯỚI

***Evaluation for tolerance to Greening disease of some citrus varieties by vector psyllids,
Diaphorina citri Kuwayama, (Hemiptera: Psyllidae) in net house condition***

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Nguyễn Thành Hiếu và Nguyễn Văn Hòa*

SUMMARY

Through survey on nine citrus varieties in the field condition, the result showed that six citrus varieties: thin-peel lemon (*Citrus aurantifolia*), Calamondin (*Citrus microcarpa* (Hassk.) Bunge), Da xanh pomelo (*Citrus grandis*), Soan orange (*Citrus sinensis*), Duong mandarin (*Citrus reticulata* Blanco), King mandarin (*Citrus nobilis*) infected Greening disease with different levels. Two citrus varieties showed tolerance to Greening disease were *Feroniella lucida* and cumquat (*Triphasia trifoliata* P. Wilson).

The study in net house condition showed that *Diaphorina citri* was been the most attractive by *Citrus aurantifolia*, next one was *Limonocitrus littoralis* (Miq.) Sw. The study also showed that the *Citrus aurantifolia* only infected Greening disease at 90 days after inoculating by psyllids. The greening symptom appeared at 120 days after release psyllids. *Feroniella lucida*, *Triphasia trifoliata* P. Wilson and *Limonocitrus littoralis* (Miq.) Sw. did not appear greening symptom. They showed tolerance to Greening disease. We can use these citrus varieties for cross-breeding to create new citrus which tolerate to Greening disease.

NGHIÊN CỨU VAI TRÒ, ĐẶC ĐIỂM SINH HỌC CỦA NHỆN LÔNG NHUNG (*Eriophyes* sp.) ĐỐI VỚI BỆNH CHỐI RỒNG TRÊN NHÃN

Study on the role of Long Nhung mite (*Eriophyes* sp.) on longan witches' broom disease and its characteristics

Trần Thị Mỹ Hạnh, Nguyễn Dương Tuyền,

Lương Thị Duyên, Nguyễn An Đệ và Nguyễn Văn Hòa

SUMMARY

To study abundance of Long Nhung mite (*Eriophyes* sp.) on Tieu da bo longan variety was recorded from January to December, 2010. On hosts range study: Rambutan was recorded host of *Eriophyes* sp. in the Mekong Delta. Study on biology and ecology of *Eriophyes* sp. on longan tree in the Southern provinces: The result recorded that eggs was laid on upper surface of young leaves, pure white, and hatch into nymphs which similar to the adult, but smaller and paler, pure white, 39 circle abdomen, 2 pair legs, slow in move. Adult was pure white and dusk white (pure white adult was great number of hairs), there were two hairs in the end of a tail, 2 pair legs, quick in move. Adults infested near the veins of a leaf, on the upper surface of the leaves. The life cycle from egg to adult took 8-15 days.

NGHIÊN CỨU TÁC NHÂN GÂY BỆNH CHỐI RỒNG VÀ BIỆN PHÁP QUẢN LÝ NHỆN LÔNG NHUNG (*Eriophyes* sp.) TRÊN NHÃN

Study on the causal pathogen of witches' broom disease and management of Long nhung mite (*Eriophyes* sp.)

Trần Thị Mỹ Hạnh, Bùi Thị Ngọc Lan,
Nguyễn Thành Hiếu và Nguyễn Văn Hòa

SUMMARY

The causal pathogen of witches' broom disease is not identified yet until now. Nested polymerase chain reaction (nested-PCR) essays with five universal primer pairs were employed to investigate etiologies of disease associated with longan witches' broom (LWB) in the Southern Vietnam. Nucleotide sequences analyze of the PCR-amplified 950bp (PCR product of R16F2n/R16R2 primers followed by P1/P7 primers) fragment, revealed 93% identity of this sequence in the region 16S rDNA to uncultured Gamma-proteobacteria bacterium 16S rRNA gene (on NCBI data). Our first result identified the causal pathogen of LWB is uncultured bacterium.

*The results of study on the efficacy of some insecticides against Long nhung mite (*Eriophyes* sp.) revealed that Propargite, Diafenthiuron+ Petroleum spray oil (PSO) were the best treatments against Long nhung mite.*

NGHIÊN CỨU CÁC GIẢI PHÁP QUẢN LÝ BỆNH CHỐI RÒNG TRÊN NHÃN

Study on management of witches' broom disease on longan

Trần Thị Mỹ Hạnh, Nguyễn Thành Hiếu và Nguyễn Văn Hòa

SUMMARY

*Witches' broom on longan is a very serious problem on tieu da bo longan in the South of Vietnam, in our earlier study identified that the disease is caused by Gamma Proteobacteria and transmitted by mite *Eriophyes dimocarpi*. In this study, Agro - chemicals have been tested for control of longan witches' broom. The results shown that Avalon, Ditacin, Sat-4+Ortus were significantly effective in controlling of the disease. Efficacy of different pruned off levels and buds sprayed against longan witches' broom disease, the result recorded that pruned off 40cm twig long gave better control of the disease. The establishment of the effectively integrated management model of longan witches' broom disease in Cai Lay-Tien Giang province has been conducted, the result showed that the treatment plot including pruning off the disease branches plus miticides spraying was effective control of the disease in comparison with the farmer plot.*

Keywords: longan Witches' broom, pruning, Agro-chemical.

HIỆU QUẢ PHÒNG TRỪ RỆP SÁP *Pseudococcus* sp. HẠI NHÃN CỦA MỘT SỐ LOẠI THẢO MỘC VÀ NÔNG DƯỢC

Effect of some botanical, bio-chemical and chemical insecticides on longan mealybug

***Pseudococcus* sp.**

Huỳnh Thanh Lộc, Trần Thị Mỹ Hạnh, Nguyễn Dương Tuyền và Nguyễn Hữu Hoàng

SUMMARY

Some botanical, bio-chemical and chemical insecticides were studied on longan mealybug *Pseudococcus sp.* in laboratory and field conditions. The results showed that Chlorpyrifos ethyl and Imidacloprid were high effective on mealybug. The insecticidal property of soursop, pyrethrum, garlic and chili was very poor on mealybug.

XÁC ĐỊNH TÁC NHÂN GÂY BỆNH THỐI RỄ SÀU RIÊNG VÀ HIỆU QUẢ MỘT SỐ LOẠI THUỐC HÓA HỌC, SINH HỌC VÀ GIỐNG CHỐNG CHỊU ĐỐI VỚI BỆNH

Study on root rot causal agent on durian and effects of bio-chemical in controlling of this disease and result of tolerant varieties screening

Dặng Thị Kim Uyên, Nguyễn Tăng Thế Hào, Nguyễn Thành Hiếu và Nguyễn Văn Hòa

SUMMARY

On durian, beside patch canker, root rot is also a serious disease, which caused tree decline gradually, especially in the Mekong Delta region, where the water level is always high. In this investigation, we found that the causal agent of root rot disease was *Pythium sp.* The *Pythium sp.* has been molecularly identified as *Pythium vesans*. This *Pythium vesans* could grow well in a range of temperature from 25°C-35°C and optimum temperature for mycelium development was 30°C, and optimum pH for its development was from 5.5 to pH 6. In the lab test, the results shown that Ridomil Gold, Norshield, Aliette could control well *Pythium vesans*. Under field conditions, more chemicals could be used effectively to control *P. vesans*, and among them the Ridomil Gold was the best one. In the root rot tolerant varieties screening, the results revealed that Chanee, Kanyao, la queo vang and la queo 3 thum were tolerant to *Pythium vesans* under greenhouse conditions.

Keywords: Root rot disease, durian, *Phytophthora palmivora*, *Pythium vexans*, tolerant.

KẾT QUẢ NGHIÊN CỨU TÁC NHÂN VÀ BIỆN PHÁP PHÒNG TRỪ BỆNH THỐI TRÁI CHÔM CHÔM

Studied on causal organism of rambutan fruit rot disease and management

Nguyễn Huy Cường, Nguyễn Thành Hiếu và Nguyễn Văn Hòa

SUMMARY

Rambutan (*Nephelium lappaceum* linn) is a popular fruit tree in Viet nam. Fruit rot disease on rambutan appear to be popular at postharvest stage, when relative humidity is high, this study, *Botriodiplodia sp.* was defined to be the cause of rambutan fruit rot. Benomyl, Carbendazim, Propiconazole and Thiophanate- methyl was ability inhibited the expansion of fungi on invitro conditions. Carbendazim and Propiconazole gave good effect to the control rambutan fruit rot, under field conditions.

**NGHIÊN CỨU TÁC NHÂN GÂY BỆNH THỐI RỄ TRÊN CÂY MĂNG
CÀU XIÊM (*Annona muricata*) TẠI HUYỆN TÂN PHÚ ĐÔNG TỈNH TIỀN
GIANG**

*Study to define caused agents of root rot diseases in soursop tree (*Annona muricata*) in Tan
Phu Dong district, Tien Giang province*

*Đặng Thùy Linh, Nguyễn Hoàng Dũng, Nguyễn Huy Cường,
Nguyễn Thành Hiếu và Nguyễn Văn Hòa*

SUMMARY

*The *Calonectria variabilis* fungus and *Pratylenchus* spp. nematode were isolated, extracted, identified as pathogens of soursop root rot in Tan Phu Dong district, Tien Giang province. Soursop faster decline as a complex disease caused by the synergistic effect of these organisms (*Pratylenchus* sp. and *Calonectria variabilis*). Growth of *C. variabilis* was in wide temperature range from 15⁰C - 35⁰C, and the optimal temperature for fungal growth was from 28⁰C - 30⁰C. The fungal colony diameter of *C. variabilis* increased from pH 4.0 to pH = 7.0 and 8.0.*

Keywords: *Soursop tree (*Annona muricata*), root rot, *Calonectria variabilis*, *Pratylenchus* spp.*

**KHẢO SÁT THÀNH PHẦN LOÀI, ĐẶC ĐIỂM SINH HỌC VÀ HIỆU QUẢ CỦA MỘT
SỐ LOẠI NÔNG DƯỢC TRONG PHÒNG TRỪ RỆP DÍNH (Hemiptera: Diaspididae)
HẠI CÂY ĂN QUẢ**

*Study on diversity of scale insect species, their bio-characteristics and effects of some bio-
chemical and chemical insecticides on controlling of fruit scale insects (Hemiptera:*

Diaspididae)

*Nguyễn Thị Kim Thoa, Trần Thị Mỹ Hạnh, Nguyễn Dương Tuyên,
Trần Văn Biên và Nguyễn Thành Hiếu*

SUMMARY

*Recently, fruit scale insects become more popular and serious on sapodilla and citrus. In this investigation, we found that the scale infested on sapodilla (90%-99,1%) higher than that of citrus (21,45%-30,5%). The results of the survey also showed that there were three species of scale insect: *Pseudolacaspis* sp., *Leucaspis* sp. on sapodilla and *Unaspis* sp. on citrus. The lifecycle of the scale was studied, result revealed that the life cycle of *Pseudolacaspis* sp., was 29 ± 3,65 days for males and 41 ± 4,11 days for female at 29,7 ± 1,28⁰C and RH% of 77,7 ± 8,97. Some bio-chemical and chemical insecticides were studied for controlling of scale insect in laboratory. Results shown that Imidacloprid + Isoprocarb, Methidathion and Dimethoate + Phenthoate were highly affected on controlling of eggs of scale insect hatched.*

NGHIÊN CỨU TÁC NHÂN GÂY BỆNH THỐI RỄ CÂY ỔI
Study to define caused agents of root rot diseases in guava tree

Đặng Thuỳ Linh, Nguyễn Thị Ngọc Yến, Nguyễn Thành Hiếu và Nguyễn Văn Hoà

SUMMARY

*In the Mekong River Delta, root disease was a serious problem in guava. Based on symptoms, there were two kinds of diseases such as root knot disease caused by *Meloidogyne* sp. and root rot disease caused by fungus. The *Nalanthamala psidii* were isolated and identified as pathogens of root rot on Bom and seedless guava varieties in Vietnam. Guava faster decline as a complex disease caused by the synergistic effect of these organisms (*Meloidogyne* sp. and *N. psidii*). Growth of both *N. psidii* strains was in wide temperature range from 15⁰C - 35⁰C, both the two strains did not grow at 40⁰C and the optimal temperature for fungal growth was from 28⁰C - 30⁰C. The fungal colony diameter of *N. psidii* strains increased from pH 4.0 to pH = 7.0 to 7.5 and tended to decrease in the level of pH 8.0; 8.5 and 9.0.*

NGHIÊN CỨU ĐÁNH GIÁ KHẢ NĂNG ĐỐI KHÁNG CỦA MỘT SỐ DÒNG VI SINH
VẬT CÓ ÍCH ĐỐI VỚI TÁC NHÂN GÂY BỆNH THỐI RỄ VÚ SỮA TRONG ĐIỀU

KIỆN IN VITRO

Evaluation of the efficacy of some benefit micro-organisms against root rot disease star apple
(Chrysophyllum cainito)

Trần Thị Hoàng Linh, Nguyễn Thành Hiếu và Nguyễn Văn Hòa

SUMMARY

Star apple is one of special fruit which occupied more than 2,000 ha in Tien Giang province. Unfortunately, root rot disease attacked severely at different stages from young tree to old one and caused serious problem in reducing yield. Agro-chemicals are the choice of most farmers in controlling of the disease at present. However, using chemicals willn't give strong efficacy under field conditions.

*Thus, the studies of antagonists efficacy were carried out to find their antagonistic activity of *Pseudomonas* strains, *Bacillus* strains and *Trichoderma* strains against *Fusarium solani*, *F. oxysporum* and *Pythium splendens* in vitro. The obtaint results showed that *B. subtis* and *T. harzianum*- 4 effectively suppressed the mycelial growth of *F. solani*. Simillary, *F. oxysporum* was inhibited by *Pseudomonas* strain 1 and *T. putida*.*

*Moreover, *Pseudomonas* strain 5 and *T. harzianum* 4 were most effective and reducing mycelium growth of *P. splendens* as compared to control and other treatments.*

*Keywords: *Fusarium solani*, *F. oxysporium*, *Pythium splendens*, antagonistic, star apple, etc.*

**ẢNH HƯỞNG XỬ LÝ NHIỆT KẾT HỢP DUNG DỊCH MÀNG PHỦ BẢO QUẢN LÊN
CHẤT LƯỢNG NHÂN ‘TIÊU DA BÒ’ TRONG ĐIỀU KIỆN TRỮ LẠNH**

Effect of heat treatment in combination with preservative coating solutions on quality of “tieu da bo” longan under low temperature storage

Nguyễn Văn Phong và Nguyễn Thanh Tùng

SUMMARY

To evaluate the effect of heat treatment in combination with preservative coating solutions on quality of “tieu da bo” longan fruit under low temperature storage. Two experiments were established as follow: (i) the first experiment was done by dipping the longan fruits into 1% (w/v) chitosan coating of citric acid solution having (pH=2.4; 2.5; 2.6 and 2.,8); 0.5% (w/v) commercial citrex coating solution (pH=3.3) and water (as the control) for 0.5; 1; 2 and 4 minutes and finally packed in PE holed bags and stored at 5°C; the second experiment was done by submerging the fruits in hot water at temperatures of 45; 47 and 49°C for 4 minutes and followed by dipping into the best preservative coating solution treatments, which were selected from the 1st experiment and finally packed in PE holed bags and stored at 2, 5 and 10°C. Results from these two experiments are summarized as follows: (i) longan fruits treated with the chitosan coating solution at pH 2.6/2 minutes or citrex at pH3.3/4 minutes could be maintained the good fruit quality for 21 days at storage temperature of 5°C. (ii) Hot water treatment at 47°C and then dipped into a solution of citrex (pH 3.3)/4 minutes and finally stored at 5°C was the best combined treatment to control browning pericarp and maintain quality of longan for 21 - 28 days.

Key words: hot water treatment, longan, coating solution, browning pericarp.

**ẢNH HƯỞNG CỦA NHÚNG HÓA CHẤT VÀ BAO TRÁI SAU THU HOẠCH ĐẾN SỰ
ỨC CHẾ HÓA NÂU VÀ CỨNG VỎ TRÁI MĂNG CỤT BẢO QUẢN TƯƠI**

Effects of chemical dip and post harvest fruit bagging/coating on anti-browning and anti-hardening of mangosteen fruit during storage

Phạm Hoàng Lâm, Đặng Linh Mẫn và Nguyễn Văn Phong

SUMMARY

The effects of chemical dip and different postharvest fruit bagging materials on anti-browning and anti-hardening of mangosteen during storage were investigated. The results showed that mangosteen fruits dipped in acid citric 1% for 3 min and followed by wrapping the fruits with Citra Shine coating at (1: 4) and finally packed in PE bags were evaluated as the most suitable to control the fruit peel browning and hardening. In addition, the fruit quality in this treatment was found to be better as compared to the control and the others.

NGHIÊN CỨU CÁC TÁC NHÂN GÂY BỆNH SAU THU HOẠCH TRÊN QUẢ THANH LONG TRONG CHUỖI CUNG ỨNG LẠNH

*Study on causal agents of the postharvest rot diseases on dragon fruits
in cool supply chain*

Dương Thị Cẩm Nhung, Trần Thị Hoài Vi và Nguyễn Văn Phong
(*): Trường Đại học Kỹ thuật công nghệ Tp.HCM*

SUMMARY

*Under low temperature storage, 4 fungi of *Pyrenophora seminiperda* (brown spots rot), *Fusarium dimerum* and *Fusarium subglutinans* (white spot rot), *Phomopsis longicolla* (stem rot) were identified as the main agents causing the postharvest rot diseases on dragon fruit. Evaluation result of the growth ability at different temperatures in vitro indicated that most of them could not be developed at 3 °C and slowly developed at a temperature range of 13-16 °C and quickly at 25-30 °C. Evaluation result on infected dragon fruits and in condition of heat treatment indicated that hot water dip (53°C time 6-9 min) inhibited to the growth of the investigated fungi without causing fruit damage when stored at ambient temperature.*

Key words: *Pyrenophora seminiperda, Fusarium dimerum and Fusarium subglutinans, Phomopsis longicolla, diseases on dragon fruit.*

KHẢO SÁT NHU CẦU VÀ KHẢ NĂNG LIÊN KẾT TIÊU THỤ SẢN PHẨM CỦA CÁC CƠ SỞ/DOANH NGHIỆP KINH DOANH TRÁI CÂY VỚI CÁC TỔ HỢP TÁC/HỢP TÁC XÃ SẢN XUẤT BƯỞI, NHÃN, CHÔM CHÔM

*Surveying for the demand and linkage ability in consumption between the enterprises and
pomelo, longan and rambutan cooperatives*

Đoàn Hữu Tiến và ctv

SUMMARY

The result of surveying for the demand and linkage ability in consumption between the enterprises and pomelo, longan and rambutan cooperatives showed that the demand of buying of enterprises increase 170% amount for Da xanh pomelo, 135% amount for Tieu da bo longan and 126% amount for Java rambutan respectively. There were 44%, 52% and 56% of pomelo, longan and rambutan enterprises having demand to buy products from pomelo, longan and rambutan cooperative respectively. To supply enterprises with big amount, uniform size and price as the market price were the requirements of the most of enterprises buying pomelo, longan and rambutan. During linking, the enterprises are responsible for grading, packing and selling products, they are not interested in giving the capital and providing materials and technic to farmers.

ĐÁNH GIÁ HIỆU QUẢ MÔ HÌNH LIÊN KẾT SẢN XUẤT BƯỞI DA XANH

Evaluation of the linkage model of Da xanh pomelo production

Lương Ngọc Trung Lập

SUMMARY

The model of linkage production of Da xanh pomelo is benefit for farmers who participated in the cooperative. The production cost of Da xanh pomelo in 2011 was slightly increased by 0,51 millions VND per hectare while the yield and profit of Da xanh pomelo were increased by 1,0 tonnes per hectare and 19,12 millions VND per hectare, respectively, compared with non-members of the cooperative. Helping farmers to access new technologies, used of input and labour resources, changing farming practices towards high quality production, food safety, improving the environment, a healthy of labourers... are the goal of the model of linkage production. Food safety and traceability of the product are of great advantage to supply in the market.

ĐÁNH GIÁ HIỆU QUẢ MÔ HÌNH LIÊN KẾT SẢN XUẤT CHÔM CHÔM

Evaluation of the linkage model of Java rambutan production

Đoàn Hữu Tiến, Lê Thị Lan Dung và Lương Ngọc Trung Lập

SUMMARY

The model of linkage production of rambutan is benefit for farmers who participated in the cooperative. The production cost of rambutan was reduced by 5,52 millions VND per hectare while the yield and profit of rambutan were increased by 0,7 tonnes per hectare and 10,26 millions VND per hectare, respectively, compared with non-members of the cooperative. Helping farmers to access new technologies, used of input and labour resources, changing farming practices to towards high quality production, safe food, improving the environment, a healthy of labourers... are the goal of the model of linkage production. Food safety and traceability of the product are of great advantage to supply in the market.

ĐÁNH GIÁ HIỆU QUẢ MÔ HÌNH LIÊN KẾT SẢN XUẤT NHẪN

Evaluation of the linkage model of Tieu da bo longan production

Lê Thị Lan Dung, Đoàn Hữu Tiến và Lương Ngọc Trung Lập

SUMMARY

The model of linkage production of longan is benefit for farmers who participated in the cooperative. The production cost of longan was reduced by 3,18 millions VND per hectare while the yield and profit of longan were increased by 2,5 tonnes per hectare and 39,08 millions VND per hectare, respectively, compared with non-members of the cooperative. Helping farmers to access new technologies, used of input and labour resources, changing farming practices to towards high quality production, safe food,

improving the environment, a healthy of labourers... are the goal of the model of linkage production. Food safety and traceability of the product are of great advantage to supply in the market.

KẾT QUẢ CHỌN TẠO GIỐNG ĐẬU BẮP LAI LD8

Results on breeding of hybrid okra variety LD8

Trần Kim Cương, Nguyễn Ngọc Vũ và Lê Trường Sinh

SUMMARY

First hybridization program was made between 5 okra lines which selected from 15 lines. And among 20 hybrids produced, the hybrid LD8 (line ĐB5 x line ĐB2) is considered one which vigorous growth suitable for growing in both two main seasons, resistant to the some important diseases, many fruits/plant (13 - 17 fruit), beautiful fruit with green color, fruit weight 25g, high yield (8,79 tonnes/ha and can crease to 22,96 tonnes/ha). This hybrid is being proposed to used in the farming areas of the Southern provinces.

KHẢO NGHIỆM GIỐNG ĐẬU BẮP LD7 TRÊN ĐẤT XÁM TẠI BÀ RỊA VŨNG TÀU

Testing on cultivar okra LD7 on grey soil in Ba Ria - Vung Tau

Lê Thị Vân và Nguyễn Thị Thúy Bình

SUMMARY

*Okra (*Abelmoschus esculentus*) is vegetable kind popular grown in Southern of Viet Nam. Cultivars okra LD7 were tested at Chau Pha, Tan Thanh, Ba Ria - Vung Tau for evaluating adapted ability, agronomy characters and productivity. The results indicated that cultivar okra LD7 was adapted with climate condition in Ba Ria - Vung Tau. Quick harvesting (45 days), average height (157.53 cm); primary branch (5.07). LD7 have long fruit shape, straight, green, smooth, low prickle rate. Productivity is 879 kg/1000m², similar with cultivar AS 504 (ASENTA). LD 7 is rarely infected than control AS 504.*

KẾT QUẢ CHỌN TẠO GIỐNG DƯA LEO LAI LD7

Results on breeding of hybrid cucumber variety LD7

Trần Kim Cương và Huỳnh Vũ Sơn

SUMMARY

The source materials include 90 samples were selected by using top cross method to test the general combining ability, combine with phenotype observation and evaluation. The 11 best lines were selected and used as the parental lines. The hybridization were made by using diallele methods. The select prospect combination has been done and among 110 hybrid combinations produced, after 4 crop season trials, the hybrid LD7 (line 12 x line 77) is considered one which early harvest, average branching, many flowers on the main stem, elongated fruit type, crispy

sweet flesh and green color peel which preferred in market now. In 2011, the hybrid LD7 has been tested in production in Tien Giang, Tra Vinh and Ba Ria Vung Tau. The results showed that this hybrid has vigorous growth; resistant to the some important diseases, high yield (from 22.4 to 38.2 tonnes/ha). The hybrid cucumber variety LD7 is being proposed to use in the farming areas of the Southern provinces.

KHẢO NGHIỆM GIỐNG DƯA LEO LD8 TRÊN ĐẤT XÁM TẠI BÀ RỊA VŨNG TÀU

Testing on cucumber cultivar LD8 on grey soil in Ba Ria - Vung Tau

Vũ Thị Hà và Nguyễn Thị Thúy Bình

SUMMARY

Evaluation for adapted ability, biology characteristics and productivity for cultivar cucumber LD8 were done at Chau Pha, Tan Thanh, Ba Ria - Vung Tau. The experiment was carried in Summer - Autumn (6/2011 - 9/2011). Cultivars LD8 were planted on two rows (wide 1,5 m, high 25 - 30 cm), space of row 80 cm, space of plant 50 cm, with two replications. The results of experiment indicated that growing time of cultivar LD8 is 67 days. Early harvesting after 35 days, and prolonged for 32 days. Cultivar LD8 have green stem and leaf, moderated branching (3,0 branch/plant); main stem length (2,77 m); density fruit (9,9 fruits/plant); average fruit weight (168,5 g/fruit); productivity (3,09 tons/ha/season); bold green coat; length fruit (15,7 cm); straight shape; diameter (3,62 cm); fragrant taste suitable for fresh or procession, rarely insect and disease.

NGHIÊN CỨU XỬ LÝ ĐỘT BIẾN *IN VITRO* GIỐNG HOA CÚC TÍM NHẬT BẰNG

TIA GAMMA

In vitro mutagenesis study on Chrysanthemum morifolium 'Tim Nhat' variety

Lê Nguyễn Lan Thanh, Nguyễn Thị Hương Lan và Nguyễn Văn Sơn

SUMMARY

Flowers of Chrysanthemum morifolium 'Tim Nhat' variety are purple colour and florets are flat spoon shape. Young flower buds cultured on Murashige and Skoog's medium supplement with 0.5 mg/l benzyladenine for shoot formation. In vitro internodes with buds were irradiated by γ -radiation (at 5, 10, 15, 20 and 30 Gy). Rooting shoots from γ -irradiated treatments were hardening in the greenhouse and transplanted in the shadehouse for selection. Mutants were obtained at all dose treatments. The mutants have colours from light to dark purple and red-purple, some having flat spoon shaped ray florets similar to the original cultivar, but the different were ray floret structures and size of flowers. Promising mutants were 11 lines (1,5kTN5; 3k59; 3kTN14; 1,5k84; 3k32-1; 1k27-07; 3 kTN12; 0,5k74; 1,5k66; 2k5 and 0,5k89) with new colour and shape different from the original cultivar. Mutation in flower colour was

detected from 10 Gy treatment in MIV1 and MIV2 generations. Gamma ray induced flower colour mutant of 1k27-07 line was very attractive colour (light mauve).

**NGHIÊN CỨU NHÂN NHANH *IN VITRO* GIỐNG HOA VẠN THỌ (*Tagetes erecta* L.)
“VT18-2”**

Study on in vitro propagation of marigold (*Tagetes erecta* L.) “VT18-2” variety

Nguyễn Văn Sơn, Nguyễn Thị Hương Lan và Lê Nguyễn Lan Thanh

SUMMARY

*The aside shoots (2-3 cm, 2-3 leaves in length) of marigold (*Tagetes erecta* L.) “VT18-2” variety were surface disinfected in 10% Canxi hypochloride for 10 minutes and then rinsed four times in sterile double distilled water. For shoot multiplication, single shoot was subcultured on MS medium supplemented with 0,4mg/l BA. Individual shoot was cultured on MS medium containing 0,1mg/l IBA for rooting. All plantlets acclimatized well on coco peat: rice husk: sand: organic manure: soil (1: 1: 1: 1/4 ratio).*

Key words: marigold, Canxi hypochloride, NAA, IBA & BA.