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Editorial	i
Participants	iii-v
Contents.....	vii-viii

Designing a new peach orchard growing system aiming to reduce pesticides and improve profitability

Lichou J., Hilaire C, Mandrin J.F., Mathieu V., Soing P. 1-5

Abstract: This concept takes current environmental limitations into account by reducing fertilizer and in particular, pesticide use. With sustainable agriculture the main objective is to combine quality with profitability to maintain the future of farms. This orchard system aims to attain these objectives by using a growing system based on regular regeneration and plot rotation.

Adapted tree management ensures reasoned crop protection by reducing the number of treatments and training the trees in a low volume hedgerow allows quantities to be greatly reduced. The trees are not regarded as permanent entities but more as regenerating fruiting supports on which work can be carried out that is easier and that can be mechanised resulting in greater labour efficiency without lowering yields.

Observation on leaf mineral composition of sweet cherry trees grown under organic management

Roversi A., Monteforte A., Castellino L. 7-12

Abstract: the sweet cherry leaf mineral composition of 7 varieties (Colafemmina, Denissens, Drogans, Ferrovia, Pagliarsa, Stark G.G. and Stella) was investigated for the same orchard both during the conventional and the successive organic management. The data obtained for N, P, K, Ca and Mg show clearly a strong influence of management system on leaf mineral contents.

Because the organic management protocol strictly forbidden the use of mineral fertilizers, mainly for which that provide N, a decrease of leaf mineral status was expected over the years.

Really this was observed whit the only exception of K which instead increases. The levels of macronutrients found in the leaf of trees under organic management are very unsatisfactory and then a revision of protocol about fertilizers supply could be very desirable.

Genetic and functional characterization of the peach-*Myzus persicae* interaction: towards breeding for durable resistance within integrated orchard management pest in plum fruits?

Sauge M.H., Pascal T., Kervella J., Lacroze J.P., Corre M.N., Pfeiffer F., Grechi I., Lescourret F., Moing A., Renaud C., Gaudillère M., Poëssel J.L. 13-18

Abstract: Integrated production of fruit and vegetable species is one major field of research at Avignon INRA centre. Breeding for durable resistance to the green peach aphid, *Myzus persicae* (Sulzer) and other enemies of peach crop (*Prunus persica* L. Batsch) has been initiated fifteen years ago. Several sources of resistance are available among wild and domesticated peaches. Because all resistance genitors used in these programmes are of poor agronomic value, improvement of fruit quality is a long-lasting process. In order to avoid the erosion of the level of plant resistance during this process, the detailed analysis of the underlying mechanisms was undertaken. Here, we present some aspects of the work carried out on the genetic and physiological mechanisms of peach resistance to *M. persicae*. In addition to the analysis of the plant-aphid interaction under the influence of plant genetic factors, the effects of technical operations, such as winter pruning or nitrogen fertilization, on the aphid population dynamics are being investigated. Varietal resistance combined to cultural practices can be considered as

an ultimate strategy to increase the efficacy of aphid control in orchards.

Evaluation of some insecticides against the peach trunk aphid, *Pterochloroides persicae* (Cholodkovsky) (Homoptera: Lachnidae), on peach in Jordan

Ateyyat M.A. 19-27

Abstract: Experiments were carried out in Ash-Shoubak on 10-year old peach trees, *Prunus persica* (L.) that were infested with the peach trunk aphid. The efficacy of five insecticides was tested against this insect by spraying the trunk and main lateral branches of the infested trees. The tested insecticides were; Confidate® (a.i., Imidacloprid), Chlorcyrin®(a.i., Chlorpyrifos & Cypermethrin), Patron®(a.i., diflubenzuron), Trivap®(a.i., Cyromazine) and Vapcomor®(a.i., Acetamprid). All of these insecticides were applied in June and August 2006. Data on nymph and adult mortality have been observed after 2, 7 and 14 days of insecticides application. Only Vapcomor® did not reduce aphid population significantly compared with the untreated control. Both Confidate® and Chlorcyrin® resulted in the highest significant mortality of both nymphs and adults. The present study suggests that both insect growth regulators, Patron® and Trivap®, are potentially important biorational insecticides in the integrated management of the peach trunk aphid.

Survey on the presence of “mace” and “kdr” mutations in populations of the green peach aphid (*Myzus persicae*): preliminary results

Pavesi F., Criniti A., Cassanelli S., Bizzaro D., Manicardi G., Cravedi P., Mazzoni E. 29-33

ABSTRACT: The green peach aphid (*Myzus persicae*), is lastly one of well studied insect model to dissect insecticide resistance mechanisms. As a result, a few *in-vitro* diagnostic tools were added to the traditional *in-vivo* bioassays to monitor the presence of resistance in populations of this pest. Since different control strategies and different resistance mechanisms are often involved, both biochemical and molecular approaches must be followed. Biochemical assays can be used to assess esterase detoxifying/sequestering activity as well as the acetylcholinesterase insensitivity to some insecticides. Molecular screening by RFLP-PCR, may be also effectively performed to detect previously identified target site mutations. Herewith we analyzed aphid populations collected in peach orchards from Emilia-Romagna (the most important peach growing area in Italy) for the presence of elevated esterase expression and acetylcholinesterase insensitivity to pirimicarb. Gene mutation occurrence in acetylcholinesterase (S431F) and in voltage-dependent sodium channel (*kdr*), conferring resistance to dimethylcarbamates and pyrethroids respectively, have been also checked. Information regarding the co-selection of different insecticide resistance mechanisms are thought supporting technical assistance services, to select the most suitable pest management strategies against *M. persicae*.

Des notes sur la préférence de ponte par *Anarsia lineatella* (Lepidoptera: Gelechiidae) sur le pêcher et des autres hôtes en laboratoire

Damos P., Savopoulou – Sultani M. 35-42

Résumé: La préférence de ponte d'*Anarsia lineatella* (Zeller) est effectuée par des individus femelles sous la présence des parties différentes du pêcher (*Prunus persica*) mais des autres hôtes aussi, situés dans des cages au laboratoire et sous des conditions stables. Des expériences de double choix sont réalisées en utilisant des parties différents du pêcher pour la ponte (bourgeons – fleurs, feuilles – bourgeons, fruits – bourgeons). Dans tous les cas un pourcentage plus important des oeufs s'est déposé sur les fruits et les fleurs en comparaison avec celui des bourgeons et des feuilles. Ayant comme intention d'examiner si il y a une préférence particulière de ponte parmi quelques autres variétés du pêcher deux expériences sont réalisées: de deux choix (*Loadel* - *Nectarina*), et de quatre choix (*Loadel*, *Nectarina*, *Everts* and *J. gold*). Dans tous les cas les fruits de *Nectarina* ne sont pas préférés pour la ponte. En plus, deux communs hôtes potentiels qui se cultivent dans la même région de la Grèce du nord (*Malus pumila* et *Prunus domestica*) sont testés avec deux variétés communes (*Loadel* et *Nectarina*).

Pendant ces expériences de quatre choix on remarque qu' un grand pourcentage d'oeufs sont déposés sur les fruits du pêcher en comparaison avec les autres fruits où s'est dispersé le reste des oeufs. Nos recherches nous montrent qu' il existe une préférence particulière de ponte par *Anarsia lineatella* en indiquant les fruits et les fleurs du pêcher comme les plus préférables pour elle. Ce phénomène est très fort et plus spécialement, parmi les variétés des fruits qui ont du trichoma. En plus, ce microlepidoptère est capable de déposer un pourcentage des oeufs dispersés sur des autres hôtes qui prennent des caractéristiques morphologiques, de préférence, par la femelle, comme la pomme. Ces résultats ont un intérêt spécial et il contribue à des changements possibles à la population dynamique du rural. Alors, il faut tenir compte de cette information à la recherche des facteurs de la phénologie d' *Anarsia lineatella* aux régions où un spectre ample des variétés et des hôtes est présent.

Disruption of matings of *Anarsia lineatella* in peach orchards

Molinari F., Iodice A., Bassanetti C., Natale D., Sambado P., Savino F. 43-46

Abstract: Peach Twig Borer (*Anarsia lineatella*) has been widespreading its distribution in stone fruit cultivation areas. In peach orchards the damages of PTB overlap to the ones of Oriental Fruit Moth (*Cydia molesta*). Mating disruption is effective in the control of OFM, while some more inconsistent results are reported against PTB. In fact, even in MD plots it is not uncommon to record male catches in the standard monitoring traps. Studies have been undertaken to define the effect of different ratios of the components of PTB pheromone blend.

The reduction of catches in traps baited with the synthetic pheromone or with virgin females, compared with one control, were recorded in 2 plots where dispensers for MD containing only *trans*-5-decenyl acetate and both *trans*-5-decenyl acetate and *trans*-5-decenol were applied.

The response of males to the same attractants was tested in a wind-tunnel and by EAG analysis.

Cherry Fruit Fly – Methodological studies to increase the efficacy of bioassays

Mandrin J.F., Lichou J., Lochard G., Lagrevol J. 47-50

Abstract: Trials carried out for the registration of new products is costly and dependant on the natural infestation level. The aim of the studies presented here, is to perfect a method that makes trials more reliable and less costly. It consists in releasing fruit flies in insect proof bags/sleeves that cover fruit-bearing branches, thus ensuring artificial contamination on relatively small plots. A trial carried out in 2006 showed that 66% of fruit were contaminated in the untreated control, compared to 3.5% of the treated fruit; a control plot showed a natural infestation level of 4%. The fruit flies used for artificial infestation came either from traps in orchards, or were reared in cages using pupae. Developing rearing techniques over a complete life cycle are also being studied for mass insect rearing.

Efficacité du GF-120 dans la lutte contre la mouche de la cerise

Filleron E., Pinczon du Sel S., Vinciguerra L. 51-58

Abstract (Efficiency of the GF-120 used in the cherry fruit fly management): Cherry fruit fly management is a major concern for french cherry growers. The active ingredient diméthoate currently being used will soon be withdrawn. So it is more than useful to develop new means of control against this pest. GF-120, a plant protection product developed by Dow AgroSciences is effective on adults only. Pesticides used against adults are not very efficient because of the high cherry fruit fly mobility. But GF-120 associates an insecticide (spinosad) and an attractant which helps to solve this problem.

Some experiments have been carried out at the Domaine Experimental La Tapy (Vaucluse, France) since 2004 to test GF-120. We are currently able to define an optimal control program for GF-120. The first GF-120 application must be done from the beginning of the cherry fruit fly emergence, then it has to be repeated every week for the duration of the flight. In those spraying conditions and under a low cherry fruit fly pressure, GF-120 appears to be as efficient as diméthoate.

Bait sprays to control the European Cherry Fruit Fly *Rhagoletis cerasi*

Köppler K., Vogt H., Storch V. 59-66

Abstract: In 2005 and 2006 experiments to control *Rhagoletis cerasi* with bait sprays were carried out in field cages with single cherry trees. The intention was to examine possible effects of different bait spray formulations on the mortality of *R. cerasi* (short term tests) and fruit infestation (long term tests). Baits containing spinosad (GF-120™ Naturalyte Fruit Fly Bait and a corn by-product as bait), NeemAzal®-T/S with azadirachtin as insecticidal component and, as insecticidal standard, α -cypermethrin were used. NeemAzal®-T/S and α -cypermethrin were mixed in a sugar-brewers yeast solution as bait. 30 ml of bait solution were sprayed on 2 to 3 branches of each caged tree, and a defined number of cherry fruit flies was released after treatment. For short term tests bait sprays were applied and fruit flies released only once. In these experiments fruit flies were recaptured with yellow sticky Rebell® traps. For long term tests, one bait application per week and 3 releases of *R. cerasi* were realized within 4 weeks. In the short term tests the different bait spray formulations with spinosad resulted in mortalities of *R. cerasi* of up to 100 %, which differed significantly from the control. In another short term test with GF-120 a significant decrease of fruit flies was observed after 3 hours with an efficacy of 79 %, which increased up to 100 % after 3 days. In long term tests fruit infestation decreased significantly with GF-120 as well as with the neem product containing bait formulation (efficacy 95 %, 84% respectively). Persistence of GF-120 was satisfying for at least 9 days, when treated cherry leaves were kept under a UV translucent, but rainproof foil.

These results indicate a high potential of bait sprays against *R. cerasi*, but further investigations are required to develop a feasible strategy to control the pest.

Evaluation of some insecticides for the control of the cherry fruit fly (*Rhagoletis cerasi*) in

Integrated Production

Caruso S., Boselli M. 67-71

Abstract: The cherry is a typical production of the Emilia-Romagna Region and, in particular, of the “typical growing area of Vignola” where it represents an important source of income for local producers. The cherry fruit fly is the main pest for this crop; over the last few years there has been an increase of this parasite that is currently widespread in all areas of production. Presently the control of the cherry fruit fly in the Integrated Production Management of the Emilia-Romagna Region involves the use of Dimethoate which have a toxicological profile that present risk factors for both men and the environment. This product is classified as a harmful (Xn), therefore, a license is necessary. However, over the last few years, Dimethoate-based products, have become available on the market, classified as irritant (Xi) or “Non-classified”, in which “green” solvents (fatty acid ester-based) are used. These products have replaced hydrocarbon-based products (such as xilene, nafta) commonly used in commercial products. In this way there has been an increase of Dimethoate-based products which are less toxic for men and the possibility of buying them without a license. This aspect is much appreciated among producers in Vignola, where there is elevated average age for producers and where there are numerous small part-time family-run farms. Since solvents can also influence the efficacy of products it has been necessary to carry out specific trials to evaluate the behaviour of these new products. For the same reason, the efficacy of Fosmet has also been evaluated. Fosmet is a “Non-classified” product with safety interval, which over the next few years should change from 30 to 14 days and be less than that of Dimethoate (20 days). This work was carried out in a cherry farm situated in the hills with a high cherry fruit fly population. The results of this two-year study showed good performance of this new products in tests, demonstrating an efficacy comparable to than of “harmful” Dimethoate.

Area-wide mass trapping to control *Ceratitis capitata* (Wied.) on stone fruits in Girona, NE of Spain

Batllori L., Escudero A., Vilajeliu M., Garcia Molí F.; Benezam J. 73-82

Abstract: A project involving Mediterranean fruit fly (*Ceratitis capitata* (Wied.) (=MFF)

(Diptera: Tephritidae) control was carried out in 2005 and 2006 in stone fruit area of Girona by using a mass trapping method in accordance with a compulsory regional order to prevent fruit damage by this pest which included economic aids for the traps and the attractants the fruit growers needed. The aim was to control the MFF using a mass trapping method instead of chemicals. The strategy used was to detect the first adult MFF activity using a network of control points and, as soon as the pest occurrence was verified, to install a mass trapping system in the orchards to compete at an advantage with the stone fruits there. The mass trapping system used consisted of placing Maxitrap® model (Probodelt) traps, with Ferag CC D TM® lures (SEDQ) and DDVP insecticide inside, in doses of 50 per ha. The lures consisted of 3 membrane dispensers of trimethylamine, ammonium acetate and diaminoalkane. Once the harvest was completed, the fruit remaining in the fields was mechanically ground. In trial conditions during the two years, the project to control the MFF had very good results. Only slight damage was found at harvest in a few peach orchards (< 0.7 % of the fruits) and chemical insecticide sprayings not needed throughout the ripening process of the fruits.

Potential of ground arthropods as predators of larvae and pupae of fruit flies (Diptera: Tephritidae)

Lochard G., Mouton S., Garcin A. 83-90

Abstract: In fruit production, several pests of great economic importance are difficult to control by conventional pesticide applications. Moreover, the revision in registration of plant protection products has had little success, in particular for fruit flies *Bactrocera oleae* (Gmelin), *Rhagoletis cerasi* (L.) and *Ceratitis capitata* (Wiedemann). These pests have a very long life stage on the ground, during which predation by generalist biocontrol agents is high. Here we present a study on the food preferences of Carabidae and Staphylinidae species largely present in stone fruit orchards in South-West of France, as well as first observations on *in situ* fly pupae consumption. The best biocontrol agents of fruit fly populations seem to be *Harpalus affinis* (Schrank) and *Harpalus distinguendus* (Duftschmid) in spring, and *Calathus fuscipes* (Goeze), *Pseudophonus rufipes* (De Geer) and *Ocyopus olens* (Müller) in autumn.

Orchard susceptibility of stone-fruit cultivars to *Xanthomonas arboricola* pv. *pruni*

Garcin A., Bresson J., Fabresse M., Neyrand S. 91-95

Abstract: Bacterial spot of stone fruit is caused by a pathogen detected in France in 1995: *Xanthomonas arboricola* pv. *pruni* (Xap) causes severe losses at harvest for growers in the south of France. Faced with the impossibility of controlling this pathogen with pesticides when climatic conditions are favorable for its development, it is necessary to turn to varietal susceptibility as a solution. Thus Ctifl has undertaken a study in a contaminated area to determine the level of susceptibility to this disease of a hundred peach, apricot and plum varieties planted in 2002, 2004 and 2006. For the 50 varieties planted in 2002, five years observations on incidence and severity of the attacks on leaves and fruits have resulted in the level of the damage caused by Xap according to the cultivar to be determined. The data for the varieties planted more recently are still insufficient, the levels of damage observed in 2005 and 2006 were low, due to unfavorable climatic conditions for disease development.

Damages by *Capnodis tenebrionis* in stone-fruit orchards in Northern Italy

Cravedi P., Pollini A. 97-99

Abstract: Apricot cultivation is very important for some Italian Regions, particularly for the hilly countries of Romagna (in Northern Italy). In that area, orchards have been set up on clayey soil, often without possibility of irrigation.

Among apricot pests, *Anarsia lineatella* has always been considered as a key species. In the last few years heavy attacks of Flatheaded Woodborer *Capnodis tenebrionis* (Coleoptera: Buprestidae) have been observed in plots without irrigation. Infestations were particularly heavy in young orchards. *C. tenebrionis* is a typical pest of Southern Italy and it never caused great damage in northern regions. Studies concerning adult's behaviour, oviposition and larval behaviour started in 2003 in an Appennine area of Bologna province. Some comments on the

damage levels and on possible pest control activities are reported.

Un ravageur émergent, *Cossus cossus*

Roubal C., Rouillé B., Marty K., Filleron E., Berud M. 101-108

Abstract: Le retrait des oléoparathions a laissé un vide dans la protection contre ce ravageur sur cerisier. Les traitements à la lance en post récolte étaient une technique détestée des producteurs, la seule homologuée, d'ailleurs. Réalisée sur les pontes fraîches et les toutes jeunes larves n'ayant pas eu le temps de s'insérer trop profondément sous l'écorce, la méthode avait une bonne efficacité sur les parcelles modérément atteintes. Même si le cerisier est l'espèce la plus communément attaquée, le cossus très polyphage, a profité de cette situation pour élargir son champ d'action. En effet les partenaires du réseau PFI (la Pugère) nous ont signalé cette année plus de dégâts que de coutume sur pommier. Cela est peut être déjà un effet secondaire lié à l'allégement des traitements insecticides suite à la forte implantation de la confusion sexuelle dans la région. Par ailleurs le SRPV Midi-Pyrénées nous a signalé des attaques sévères sur prunier. Dès l'an 1999, un réseau de pièges coordonné par la Tapy a été mis en place afin d'apporter quelques éléments sur la biologie de ce lépidoptère, qui est par ailleurs relativement mal connu. Les informations les plus consistantes ont été compilées par Balachowsky et Audemard qu'ils s'agissent de données bibliographiques ou des observations en élevages. Ces travaux ont orientés les observations biologiques que nous avons réalisées et suite au retrait annoncé des oléoparathions nous avons immédiatement mis en place en partenariat des études visant un point faible du cycle du cossus. Il s'agit de badigeon, qui constitue une barrière mécanique (ou mécanique et insecticide). La technique peut potentiellement gêner les adultes qui cherchent un lieu de ponte mais surtout les larves néonates qui sont réputées très fragiles (H. Audemard, 1974). Les essais par nature pluriannuel arrivent maintenant presque à leur terme, les résultats encourageant ont déjà abouties à l'homologation de l'ARBOPAST en traitement généraux zeuzère et cossus.

Western Flower Thrips on peach: development of a risk assessment model for optimal chemical control

Mandrin J.F., Lichou J., Neyrand S., Amosse C., Vibert J. 109-115

Abstract: Western Flower Thrips populations are difficult to control with chemical methods, which leads to severe damage on peaches. These insecticides are not effective on eggs, newly emerged larva or nymphs. Timely application of insecticides is important so that an optimal number of adults are treated, preferably before egg-laying. A climate model for decision making is currently being validated. In 2006, over twenty trials were carried out on a large scale with the help of many collaborators. Analysis of several of these trials has shown the importance of timing on the efficacy of treatment. Slightly better results were obtained when treatments were carried out during the period when the model indicated that nymphs and adults were present simultaneously. Reducing insect populations early in the season is more effective than prior to harvest; this is true for both products registered in France.

Dynamics and control of *Lygus rugulipennis* Poppius in peach orchards of NW Italy

Pansa M., Vittone F., Galliano A., Tavella L. 117-121

Abstract: Since the '90s, damage to fruits due to the European tarnished plant bug, *Lygus rugulipennis* Poppius (Heteroptera: Miridae), has been recorded in peach orchards of Piedmont (North-West Italy). Investigations carried out in 1992-1994 showed that an accurate weed management in the orchards, i.e. mowing of alternate rows, prevented the plant bugs from migrating to peach trees. However, recently severe damage to peach has been reported also in well-managed orchards, so research has been carried out in 2004-2006 to assess seasonal abundance and movement of *L. rugulipennis* inside and outside orchards and to evaluate the efficacy of some insecticides commonly used in IPM to control other peach pests. Field surveys confirmed that the plant bug generally lives and reproduces on herbaceous plants, and migrates onto peach trees when winter cereals are harvested and usual host plants are lacking. Overall, in the investigated orchards, damage to peach fruits never exceeded 10%, and was mainly

localized on trees in external rows near cereal crops. Among the active ingredients (etofenprox, malathion, spinosad, thiacloprid) tested in laboratory and semifield trials, malathion was the most efficient in controlling *L. rugulipennis* adults.

A survey on cherry organic production in Italy

Ughini V., Roversi A., Triantafyllidis A. 123-124

Abstract: The Fruit Growing Institute of Piacenza and AIAB are carrying on a survey on the main characteristics of the Italian organic cherry cultivation. The information requested to 267 organic cherry growers regard : farm location and cherry orchard description; management and protection practices; harvesting and commercial organization; problems and opinion on biological cherry's cultivation. The information up to now available evidenced the heavy incidence of *Ceratitis capitata* and *Monilia* damages as phytosanitary problems, the difficulty to find adequate workers for the harvesting period and a little consumer's interest about biological cherries and so scarce remuneration for this product.

Market quality of cherries from organic management

Ughini V., Roversi A., Malvicini G.L. 125-130

Abstract: With the aim to outline consumer trends and preference the marketable quality of cherries obtained under organic production system was investigated. This paper reports the results of the evaluation of marketable visual parameters of 6 cultivars grown either under organic and conventional system, made by a trained panel. The non parametric statistic elaboration of the data had evidenced for some parameters positive (e.g. for brightness and shape) or negative (e.g. skin colour) or no different evaluation of "organic cherries" when compared with the conventional one.

Common pests in Croatian peach orchards

Barić B., Ražov J., Kovačić Z. 131-133

Abstract: The main problem in peach production and the other stone-fruit production in Croatia are aphids, *Cydia molesta*, *Anarsia lineatella* and *Capnodis tenebrionis*. Recently many problems on peach fruits have resulted from chafers of the Scarabeidae family, as well as *Cetonia aurata* and *Potosia cuprea*. They have damaged fruits after the appearance of mildew. The above-mentioned pests create considerable problems because they appear in orchards in the ripening period. Monitoring these pests is not common in Croatia in comparison to monitoring of key pests by pheromone traps. Monitoring chafers by Csalomon traps in Dalmatia has shown a large population of *Cetonia aurata* and *Potosia cuprea* in 2005 and a smaller population in 2006. The capture of chafers by traps as mass trapping could have prevented damage on peach fruits.

La Bactériose de l'abricotier, *Pseudomonas* spp. Biologie – Stratégies de lutte

Delobel-Pascal C. 135-140

Résumé: En France la bactériose (*Pseudomonas* sp.) est l'une des principales causes de mortalité dans les vergers d'abricotiers. Aujourd'hui, la lutte contre cette maladie est essentiellement prophylactique en raison de l'absence de moyens curatifs efficaces. Les connaissances acquises ces dernières années nous ont orientés vers une étude plus approfondie de deux pistes de travail : l'utilisation du porte-greffe Rubira et le recours au greffage haut. Ces deux techniques ont confirmé largement leur intérêt par la moindre sensibilité à la bactériose qu'elles confèrent, tout en assurant un comportement agronomique satisfaisant. Néanmoins une légère augmentation de la densité de plantation s'avère être nécessaire afin de garantir le rendement à l'hectare.

Summer damage on nectarine by thrips: seasonal abundance and control methods

Tavella L., Migliardi M., Bosco L., Demaria D., Vittone F., Galliano A. 141-144

Abstract: To define the origin of colour alterations on early ripening nectarine fruits, field and laboratory investigations have been conducted in the peach growing area of Piedmont (North

West Italy), in the 2002-2005 period. Such alterations (losses of the skin colour in fruit-fruit and leaf-fruit contact zones) were caused by thrips feeding in the period from the veraison to the commercial ripening of fruits. During surveys, the most abundant species was *Thrips fuscipennis* Haliday (Thysanoptera Thripidae), whose populations reached maximum levels on plants between late June and early July. Visual inspection and beating of apical leaves revealed to be a reliable sampling method to monitor thrips population dynamics, but to forecast fruit damage the unique trustworthy method was the direct counting of thrips per fruit. Among the active ingredients tested in laboratory and field trials, spinosad was the most effective to control thrips, also at lower doses than label recommendations and with mineral oil. Thus, defence strategies should include two applications to cover the 20 days from veraison to harvest; the first application could be useful to control also other insect pests while the second one should be considered specific against thrips.

Management of oriental fruit moth with ground ULV spray applications of a microencapsulated sex pheromone

Knight A., Light D., Pickel C., Kovanci O., Molinari F. 145-151

Abstract Sex pheromones have been widely used to manage oriental fruit moth (OFM) in stone fruits for 30 years. Microencapsulated formulations of sex pheromone have been developed and have proven to be an effective tactic. Recently, we developed the use of ultra low volume (ULV) ground applications of these microencapsulated products. The ULV spray is less expensive to apply and provides growers greater flexibility in adjusting their management programs for OFM. Studies in California and Turkey have demonstrated that ULV sprays can be effective. The advantages and problems associated with this new tactic and its potential adoption by growers are discussed.

Effect of winter pruning on the peach-*Myzus persicae* interaction

Grechi I., Sauphanor B., Hilgert N., Senoussi R., Sauge M.H., Chapelet A., Lacroze J.P., Lescourret F. 153-159

Abstract: Application of modeling to horticulture is not new and many models have been developed for fruit production and pest management. However, few models investigate at the same time (i) the responses of fruit tree to pest attacks and their effects on fruit quality, (ii) the regulation of pest population in relation to tree status and (iii) the response of whole system to technical operations. Improvement of Integrated Fruit Production practices require to approach all these issues in an integrated way. A modeling approach integrating peach – green peach aphid (*Myzus persicae*) system with technical operations (nitrogen fertilisation, winter pruning and biological control) is therefore under investigation in Avignon INRA research centre. An experiment was conducted to study how the intensity of winter pruning affects peach tree and aphid population and how the aphid population level affects peach production. The treatments included infested and non-infested trees and a pruning intensity gradient. Results showed that average shoot growth and degree of aphid infestation of peach tree increased with increasing pruning intensity. Aphids induced shoot-tip damage, leaf curling and leaf fall. However, aphids poorly reduce fruit quality.

Predicting the risk of post harvest rot on peaches

Mandrin J.F., Lichou J. 161-165

Abstract: Knowledge of the risk of post-harvest rot in batches of peaches can enable distribution channels to be chosen accordingly. Ctifl is developing a test that will predict the risk of contamination of fruit at harvest and during storage. This technique consists in collecting a sample of fruit about one week before the first picking and placing it in conditions conducive to the development of rot. This provides an indication of the storage potential after one or two weeks of observation. We observed a good correlation between the predictive test and monitoring disease development on samples collected at harvest.

Effect of cropping practices on brown rot in peach orchard

Mercier V., Bussi C. 167-173

Abstract: Irrigation schedules based on crop evapotranspiration or micromorphometric changes (pepista method), combined with conventional or manual pruning were tested on cv. Nectaross peaches. The effects of these treatments on brown rot were observed in 2003, 2004 and 2005. During the three years of trials, the first brown rot attacks appeared approximately three weeks before harvest. Between three weeks and one week before harvest, brown rot attacks were significantly higher with conventional pruning than with manual pruning, and there was no difference due to irrigation treatments. The last week before harvest, there were more brown rot attacks on fruits irrigated with the crop evaporation monitoring system than with pepista. The counting of infected fruits carried out on the whole tree at harvest confirmed results observed during the monitoring of a fruit sample. The post-harvest monitoring showed that fruits treated with manual pruning combined with pepista irrigation developed significantly less rots than fruits treated with the other combinations.