

An ausgewählten Böden von Reblagen mit unterschiedlich hohen Kupfergehalten werden erste Ergebnisse aus den Labortests vorgestellt. Die Herkunft und Heterogenität der Böden macht es schwierig, nur die Effekte von Kupfer auf die Aktivität der Bodenmikroorganismen zu bestimmen. Es ist nicht immer gelungen, eine geeignete Kontrolle (Referenzfläche) mit vergleichbaren Bodeneigenschaften und Bodenleben zu finden. Der Anteil der Bioverfügbarkeit von Kupfer in langjährig genutzten Böden muss mit in die Betrachtung einbezogen werden. Eine zum Teil über Jahrzehnte adaptierte Mikroflora kann ebenfalls eine allgemeine Aussage verfälschen.

Die Prüfung weiterer Böden von Reblagen mit unterschiedlichen Kupfergehalten und eine kombinierte Betrachtung mit anderen untersuchten Parametern (wie z. B. Effekte auf Bodenmakroorganismen und Nützlinge, physiko-chemische Eigenschaften der Böden) sollen helfen, die Bestimmung und Bewertung echter „Kupfereffekte“ zu ermöglichen.

19-8 - Baier, B.
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Anwendung von Verfahren der biologischen Bodencharakterisierung zur Beschreibung der Auswirkungen von Kupfereinträgen auf das Bodenleben bei langjährigem Anbau von Weinreben; Teil C: Auswirkungen auf die Larven des Laufkäfers *Poecilus cupreus*

Biological test methods used to characterize soil quality are applied to study the impact of copper contamination on soil dwelling organisms due to long-term viticulture; Part C: Effects on larvae of carabid beetle *Poecilus cupreus*

Die Larven des Laufkäfers *Poecilus cupreus* haben sich seit Jahren in Laboruntersuchungen als geeignetes Testtier zur Ermittlung der Auswirkungen von Pflanzenschutzmitteln auf im Boden lebende Nutzorganismen bewährt. Daher werden sie auch als Testorganismus in dieses größere Projekt zur repräsentativen Erfassung von Kupfergehalten in landwirtschaftlich genutzten Böden und deren Auswirkungen auf Indikatoren der Bodenfruchtbarkeit einbezogen.

In den Laboruntersuchungen werden 24 h bis 48 h alte Larven in Böden aus Weinbergen, die unterschiedlich hohe Kupfergehalte aufweisen, gesetzt. Entsprechend vorhandener Labortestmethode erfolgen die Tests in Glasröhrchen (2,5 cm Durchmesser und 7 cm hoch) mit je 25 g Trockenboden, der vorher auf 35 % seiner maximalen Wasserhaltekapazität angefeuchtet wird.

Im Ergebnis der Untersuchungen werden letale Effekte (Mortalität) und subletale Effekte (Entwicklungszeit bis zum Käfer und das Käfergewicht) dargestellt.

Sektion 20 – Pflanzenschutz in den Tropen und Subtropen

20-1 - Salah, F.¹⁾; Elamin, E.²⁾; Eltoun, E.¹⁾; Abdelgader, H.²⁾; Bordat, D.³⁾

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Susceptibility of some varieties and breeding lines of tomato to *Liriomyza* spp. infestation in Central Sudan

Tomato crop in the central Sudan is liable to heavy infestation by the leaf miners (LM). Field experiments indicated significant differences between susceptibilities of varieties and breeding lines of tomato to the damage in terms of leaf infestation percentages caused by *Liriomyza* spp. The variety 'Flora Dade' and the breeding lines Omdurman, UG Fireset A3 36L and UG Fireset A6 30R were the most infested (susceptible). The breeding line Trop G 9-18 and the varieties, 'Alfa', 'Peto 86' and 'Strain B' were the least infested (resistant). Moderate susceptibility was exhibited by the breeding lines, Hillo, UG 46 and UG Fireset A4 20R and the variety 'Red Star'.

The laboratory test revealed that 'Flora Dade' was more susceptible to *L. sativae* than Trop-G, whereas the latter was absolutely resistant to *L. trifolii*. The mean number of larvae/leaf and the larval period were taken as parameters to evaluate the susceptibilities of two breeding lines and two varieties. Omdurman harbored the highest number and Trop-G was not attacked. The two varieties showed moderate resistance. No differences were found in larval duration of the varieties and Omdurman breeding line. Resistance is attributed to antifeedants and associated with the glandular trichomes on the leaves.

20-2 - Kehail, S.; Abdelgader, H.
Agricultural Research Corporation, Wad Medani, Sudan

Testing of the egg parasitoid *Trichogramma bourarachae* Pintureau and *Trichogramma nerudai* pintureau against some Lepidopterous insect pests in Sudan

Introduction: *Trichogramma* (Hymenoptera, Trichogrammatidae) are extremely tiny wasps playing an important role in controlling many lepidopterous pests. More than one egg may be inserted into each host egg and this is based, at least in part, on the egg size.

Objective: The current study was carried to test the acceptance of two *Trichogramma* species (*Trichogramma bourarachae* Pintureau and *Trichogramma nerudai* Pintureau) against host eggs of different Lepidopterous insect pests.

Materials and Methods: Laboratory work was conducted at Agricultural Research Corporation (ARC) 2008 – 2009, eight species of lepidopterous insect pests (Storage pest, *Sitotroga cerealella*; Cabbage looper, *Trichoplusia ni*; African bollworm, *Helicoverpa armigera*; Rice moth, *Corcyra cephalonica*; Stem borer, *Sesamia cretica*; Spiny bollworm, *Earias insulana*; leaf worm, *Spodoptera exigua* and Date moth, *Ephestia calidella*) were collected at different stages (eggs, larvae and pupae) from the ARC field to the laboratory. The eggs from these pests were exposure to *Trichogramma bouraracha* and *T. nerudai* reared on *Sitotroga cereallela* and *Corcyra cephalonica*.

Result and discussion: The results showed that all eggs of the tested insect pests were accepted as host by females of *Trichogramma bourarachae* and *T. nerudai*. The average emergence rates/ egg of both *Trichogramma* species were clearly highest from *Sesamia cretica* (2.68 and 2.02) for *T. nerudai* and *T. bourarachae*, respectively, whereas the lowest emergence rates were recorded from *Ephestia calidella* (1.07 and 1.00) for *T. nerudai* and *T. bourarachae*, respectively.

However, the storage pests (date moth, *Ephestia calidella*, grain moth, *Sitotroga cerealella* and rice moth, *Corcyra cephalonica*) recorded lower emergence rates (less than 1.5) for both tested *Trichogramma* species compared with other hosts tested. In contrast the highest average female portions was recorded from *Corcyra cephalonica* (84 % and 72 %) and the lowest one obtained from *Ephestia calidella* (38 % and 27 %) for *T. nerudai* and *T. bourarachae*, respectively.

The emergence rate of *Earias insulana* and *Spodoptera exigua* were almost the same (1.57 and 1.58), respectively when parasitized by *T. bourarachae*, whereas emergence rate of *Trichoplosia ni* and *Spodoptera exigua* was approximately the same (1.77 and 1.79), respectively when parasitized by *T. nerudai*.

More than 2 adults per egg (2.68, 2.04) were emerged from *Sesamia cretica* and *Earias insulana* respectively in case of *Trichogramma nerudai*. The same female ratio (64 %) was observed when *Helicoverpa armigera* and *Earias insulana* were parasitized by *T. nerudai* and *T. bourarachae*. Although the *Trichoplosia ni* and *Sesamia cretica* have different egg size, they have the same female ratio (73 %) when parasitized by *T. nerudai*. The host eggs (stem borer, *Sesamia cretica*, leaf worm, *Spodoptera exigua* and grain moth, *Sitotroga cerealella*) have almost the same female ratio (67 %, 68 % and 69 %), respectively when parasitized by *T. bourarachae*. The *Trichogramma nerudai* was found to be more fecund relative to *T. bourarachae*.

20-3 - Salah, F.¹); Elamin, E.²); Eltoun, E.¹); Abdelgader, H.²); Bordat, D.³)

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The effects of the leaf miner, *Liriomyza* spp., host plant on the development and efficiency of their two parasitoids, *Hemiptarsenus varicornis* (Girault) and *Opius dissitus* (Muesebeck)

The Hymenopterous parasitoids, *Hemiptarsenus varicornis* (Girault) and *Opius dissitus* (Muesebeck) are associated with the leaf miner, *Liriomyza* spp., populations in Central Sudan. The effects of *Liriomyza trifolii* (Burgess) and *Liriomyza sativae* (Blanchard) reared on common bean, *Phaseolus vulgaris*, on the development and efficiency of their two parasitoids were studied at constant conditions of temperature, relative humidity and photoperiod. No significant differences were found between parasitism percentage of *H. varicornis* or *O. dissitus* on *L. trifolii* or *L. sativae*. However, significant differences were found with respect to adult (male and female) life span as well as the number of adult parasitoids emerged of *H. varicornis* and *O. dissitus*. The life span of *H. varicornis* was shorter than that of *O. dissitus*, but more adults of the later emerged from the pupae than those of *H. varicornis* which might have accounted for their almost equal parasitism percentages. Also, no significant differences were recorded with regard to the development of *H. varicornis* on *L. sativae* reared on four of its host

plants. However, parasitism percentage was significantly higher on gourd (*Cucurbita moschata*) followed by zucchini (*cucurbita pepo*), haricot bean (*Phaseolus vulgaris*) and tomato (*Lycopersicon esulentium*), respectively.

20-4 - Magedy Abd EL Azeam, A.; Abdel-Salam, S.
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Studies on population fluctuation of the whitefly, *Bemisia tabaci* (Genn.), on some soybean varieties

Six soybean genotypes that subjected to be attacked by piercing-sucking insect pestes causing severe damage especially whitefly, *Bemisia tabaci* (Genn.) were cultivated in Sohag Governorate during the two successive seasons of 2004 and 2005. The fluctuation of the pest in relation to the accumulative thermal heat unite was studied in order to predict the peak as well as the effective population with the objective to implemint the timing as well as the methods of application for the pest control. The acumulative thermal heat units were computerized on the basis of the maximum and the minimum temperature. The obtined data revealed that both general mean average of the pest population and the accumulative thermal heat units during the season of 2005 were higher than that assessed during the season of 2004.

The lowest population density of the pest was noticed during July where the mean averaged accumulative thermal heat units recorded, 2843.7 daily degrees. On the other hand, the highest mean average of the population density of the pest ranged between 25.80 and 32.46 numphs/10 leaflets; where the corresponding mean average accumulative thermal heat units recorded 3239.29 daily degrees. The mean averages of the estimated peaks were ranged between 36.00 and 49.67/10 leaflets where the corresponding accumulative thermal heat units were 3173.87 and 3238.82, respectively.

20-5 - Abou-Tara, R.; Rustom, G.; Samara, F.; Jamal, M.; Shalaby, F.
General Commission of Scientific Agricultural Research, Damaskus, Syria

The optimal release rates of each one of the two parasites *Encarsia formosa* and *Eretmocerus mundus*, aiming to control the whitefly *Bemisia tabaci* in the Syrian environment

The experiences took place in green houses in Latakia, and in open field in Ghab region. Eggplant was used as host plant to the whitefly. Three release rates were used (3, 5, 7) pairs/plant of *Er. mundus*, and (3, 5, 7) of *Er. formosa* female pairs/plant. The results showed that the optimal release rate of *Er. mundus* was 5 pairs/plant, performing 100 % of parasitism rate in green houses. The optimal release rate of *E. formosa* was 5 female pairs/plant, performing 40 % of parasitism rate. As for experiences in open field, the optimal release rate of *Er. mundus* was 5 female pairs/plant performing 81.32 % of parasitism rate. As for *E. formosa* the optimal release rate was 3 female pairs/plant with 5.03 of parasitism rate.

The test showed significant differences among the three release rates for each parasite, alongside with significant differences among parasitism rates performed by the two parasites with the three release rates, equally in green houses and open field. *Er. mundus* surpassed *E. formosa* with a significant difference.

20-6 - Abou-Tara, R.; Rustom, G.; Samara, F.; Jamal, M.; Shalaby, F.
General Commission of Scientific Agricultural Research, Damaskus, Syria

The effect of some pesticides on the adults and pupaes of two parasits *Eretmocerus mundus* and *Encasia formosa*

The experiences took place with two stages in laboratory. The first stage dealt with the effect on insecticides on adult insects. Two insecticide (Pyridaben and Pimetrozine) were selected alongside with two fungicides (Cimoxanil + Fomoxadon and Copperhydroxide), and two acaricides (Fenpyroximate and Diafenthion) according to the maximum and minimum concentrations recommended by the producer. Female parasites of same age were used in each treatment. Laboratory temperature attained 25 °C. 18 treatments were effectuated for each parasite, alongside with 3 treatments with each pesticide, treating 10 female parasites in each test tube obstructed with a piece of cotton. The numbers of dead parasites were put on record after 6, 12, 24 and 36 hours. The results were analyzed according to Dunkan test, in order to identify the less significant difference with 1 % coefficient of concentration.

Experimented pesticides were classified going from the most alarmful to the safest on the females of *Er. mundus* with the two maximum and minimum concentrations as follows:

- Pyridaben > Fenpyroximate > Copperhydroxide > Cymoxanyl + Farmoxadon > Diafenthirion > Pymetrozine.
- The classification concerning *E. formosa* females came as follows:
- Pyridaben > Copperhydroxide > Fenpyroximate = Diafenthirion > Famoxadon + Cymoxanil > Pymetrozine.

It appeared that Pyridaben is the most harmful, with his highest and lowest concentration, to the females of the two parasites; whereas Pymetrozine appears to be the safest among the experimented pesticides to the females of the two parasites.

The second stage of the experiences consisted in testing the 6 pesticides, focusing on the pupae of the two parasites existing among the nymphs of the host *Bemisia tabaci*. 18 treatments were carried out on the six pesticides (3 on each of them), once with the maximum concentration, and once with the minimum concentration and the latest with the control). Each treatment was repeated four times with 10 pupae each on a piece of a host plant in test tube obstructed with a piece of cotton. The control was treated with distilled water. The numbers of the emerging units were counted 15 days after the treatment, and until the emergence of the last parasite from the control treatment. Thus it was possible classify the pesticides going from the most harmful to the safest on the *Er. mundus* pupae:

With maximum concentration:

- Diafenthirion > Fenpyroximate > Pyridaben > Famoxadon + Cymoxanil > Cymoxanil > Copperhydroxide > Pymetrozine.

With minimum concentration:

- Fenpyroximate > Diafenthirion > Famoxadon + Cymoxanil > Copperhydroxide > Pymetrozine Classification for *E. formosa* pupae.

With maximum concentration:

- Diafenthirion > Fenpyroximate > Pyridaben > Famoxadon + Cymoxanil > Copperhydroxide > Pymetrozine.

With minimum concentration:

- Diafenthirion > Pyridaben > Fenpyroximate > Famoxadon + Cymoxanil > Copperhydroxide > Pymetrozine.

Er. mundus was more sensitive, and with significant difference, than *E. formosa*, towards the experimented pesticides.

20-7 - Rostom, G.; Abou-Tara, R.; Sydawi, A.; Amer, H.

General Commission of scientific Agricultural Research, Damaskus, Syria

Survey of natural enemies of red palm weevil in Syria

Red palm weevil, *Rhynchophorus ferrugineus*, has been introduced into Syria in 2001. It caused severe damages on palm trees. We determined tow locations for its distribution (Latakia –Tartos). Palm tree is the only host has been recorded up-till now. We collect five species of natural enemies:

- Tow species are exo-parasites on adults of red palm weevil, the first one from Acari and the second from Diptera.
- Three species of entomopathogenic fungi, first one *Trichoderma*, second one is *Fusarium*, third one *Beauvaria* sp. we isolate four different isolates from these fungus attack larvae and pupa and adults of red palm weevil.
- One species of bacteria *Bacillus* attack larvae, we isolate two different isolates belong to *Bacillus* species.

20-8 - Abdelgader, H.

Agricultural Research Corporation, Wad Medani, Sudan

Preventive and curative measures to combat early cotton insect pests in Sudan

Seed treatments promote seedling establishment, help ensure yield and reduce quality losses due to many pests and diseases. Protecting cotton plant from the attack of early-season insect pests and diseases is of prime importance to ensure a healthy and strong establishment of this strategic crop. The present study tried to measure the susceptibility of cotton flea beetles (*Podagrica* spp.), as indicator of early insect pests, to the most commonly used neonicotinoid insecticide imidacloprid as a single seed treatment or in a mixture with two antimicrobial pesticides as a preventive control measure against early season pests of cotton in Sudan.

Three different kinds of experiments: visual counts in the field, no-choice semi-field laboratory tests, and no-choice laboratory tests were used to evaluate the effects of seed dressing treatments. Flea beetle damage was assessed by counting shot-holes resulting from adult feeding.

Results showed that using the antimicrobial bronopol alone did not prevent flea beetle damage. Treatments containing imidacloprid significantly reduced damage in the three experiments, but not 10 weeks after sowing in field experiments.

The study also included two experiments to study the susceptibility of field collected adult flea beetle to foliar application of different doses of endosulfan and dimethoate to serve as a possible curative control strategy when needed. The percentage reduction of damage in treatment relative to the control was calculated. The results showed an increase in the numbers of dead beetles and/or decrease in damage to tested leaves with the increase in dosage rate. The dose response of endosulfan showed LC_{50} and LC_{99} values of 20.41 and 2862 ppm, respectively, which can be taken as indication of a good performance of endosulfan against the adult flea beetle, since the LC_{99} is still lower than the field recommended dosage rate of endosulfan (5000 ppm). The dose response of dimethoate showed LC_{50} and LC_{99} of 29.8 and 2610.7 ppm, respectively. These values indicated that the field recommended rate of dimethoate (2560) is slightly lower than LC_{99} measured during the recent study.

Sektion 21 – Rechtliche Rahmenbedingungen I

21-1 - Kaus, V.

Industrieverband Agrar e. V.

Grundlegende Veränderungen durch die neue EU-Pflanzenschutzmittel-Zulassungsverordnung (EG) 1107/2009

The fundamental changes in the new EU-Plant-Protection-Authorization-Regulation (EC) 1107/2009

Ziele der Verordnung (EG) Nr. 1107/2009 über das Inverkehrbringen von Pflanzenschutzmitteln (nachfolgend VO) sind u. a. eine erleichterte Anerkennung von Produktzulassungen zwischen den Mitgliedstaaten durch die Einführung von drei Zulassungszonen, Stärkung des hohen Schutzniveaus für die menschliche Gesundheit und die Umwelt, weitere Verschärfung der Bestimmungen für Stoffe bzw. Ausschluss von Stoffen mit sehr hoher Gefährlichkeit und Verbesserung der Funktion des Binnenmarktes.

Die Harmonisierungsbestrebungen der EU und die Zielsetzung eines effizienten Zulassungsverfahrens mit klaren Fristsetzungen sind bei diesem Ansatz durchaus zu begrüßen. Allerdings werden mit der VO in das Zulassungsverfahren für Pflanzenschutzmittel bisher nicht bekannte Instrumentarien eingeführt, die weltweit einmalig sind: Gefahrenbezogene Ausschlusskriterien im Gesundheits-, Umwelt- und ökotoxikologischen Bereich für Wirkstoffe, Safener und Synergisten ("cut-off-Kriterien") und Kriterien für nicht mehr "erwünschte" und damit zu ersetzende (zu substituierende) Wirkstoffe. Die identifizierten Substitutionskandidaten weist die EU-Kommission in einer Liste aus. Die Substitution soll auf der Ebene der Mitgliedstaaten durch regelmäßige vergleichende Bewertung von Produkten und auf jeden Fall bei Einreichung eines Zulassungsantrags erfolgen. Das "schlechtere" Produkt erhält keine Zulassung oder es wird ihm die Zulassung entzogen. Mit den "cut-off-Kriterien" erfolgt eine Abkehr von dem in der Gesellschaft akzeptierten Prinzip, neben dem theoretischen Gefahrenpotenzial auch die praxisrelevante Exposition in die Risikobewertung einzubeziehen. Die alte Regel des Paracelsus, wonach "die Dosis das Gift macht", gilt somit für eine bestimmte Gruppe von Substanzen nicht mehr. Unabhängig davon, in welcher (unbedenklichen) Dosis der Stoff später in dem fertig formulierten Pflanzenschutzmittel Verwendung finden würde, führt allein dessen Gefährdungspotenzial in konzentrierter Form schon zu dessen Ausschluss von der Zulassung. In diesem Zusammenhang ist auf die Festlegung einer wissenschaftlich umstrittenen Übergangsregelung für das Ausschlusskriterium "endokrinschädliche Eigenschaften, die schädliche Auswirkungen auf den Menschen haben können" hinzuweisen. Der Kommission ist in der VO der Arbeitsauftrag erteilt worden, bis zum 14.12.2013 dem Ständigen Ausschuss für die Lebensmittelkette und Tiergesundheit einen Entwurf der Maßnahmen in Bezug auf konkrete wissenschaftliche Kriterien zur Bestimmung der endokrinschädlichen Eigenschaften vorzulegen. Erst wenn diese auf der Grundlage wissenschaftlicher Kriterien erfolgten Festlegungen verabschiedet worden sind, soll die Übergangsregelung außer Kraft gesetzt werden. Nicht nur mit diesen Übergangskriterien sondern auch mit der Listung von Substitutionskandidaten erfolgt eine "Brandmarkung" der betroffenen Stoffe, die ihre Marktchancen wesentlich beeinträchtigen.

Im Ergebnis stellen die neuen Instrumentarien eine Überinterpretation des Vorsorgeprinzips dar. Dies wiegt umso schwerer, da es bei der Erarbeitung der VO weitgehend versäumt wurde, eine umfassende Abschätzung