Index

ANDERMATT BIOCONTROL

4 The oriental fruit moth causes significant damage in Switzerland

5 Comparison of the start of flight and the eclosion dynamics of codling moths in Valais (Switzerland) subject to various influences

6 Use of beneficial insects for strawberries and raspberries in greenhouse cultivations

7 Infestation monitoring and mass catching of drosophila suzukii

7 Drosophila suzukii – Are there alternative control measures?

8 MADEX in the tank mix – less sensitive than previously thought

9 Strategies and prospects of Andermatt Biocontrol, focusing on development in international markets

10 EXILON: product of a successful international cooperation

11 Andermatt Biocontrol invests globally in new approvals

11 A successful virus workshop

12 Use of BOLLDEX (=HELCOVEX) and LITTOVIR in new markets

13 Yield assurance with RHIZOVITAL 42

14 Andermatt Biocontrol is active in combating mice

ANDERMATT HOLLAND

15 Andermatt Holland

SYLVAR TECHNOLOGIES INC.

16 LOOPEX: a new biological control product for the cabbage looper, Trichoplusia ni

ANDERMATT BIOGARTEN

17 Fighting mould in an environmentally friendly and healthy manner

18 The end for fruit flies

18 Organic urban gardening?

ANDERMATT BIOVET

19 MAQS: Gel Pads of Formic Acid against the Varroa Mite

20 Natural strategies for fly control in the stable

ENTOMOS

21 The development of maggot debridement therapy in Switzerland

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Dear Readers,

The Andermatt Group is continuing to grow. Andermatt Holland BV is already active and is presented on page 15. The establishment of further subsidiaries is planned (see page 9). The diagram below shows the successful network of producing and distributing companies, which we intend to develop further.

All companies that are already part of the Andermatt Group also present new findings and developments in this issue of the AG-Journal. Every part of the group has included its presentation with details of the respective contact persons.

On behalf of the Andermatt Group, I wish you interesting reading.

Dr. Martin Andermatt
Chairman of the Board
Andermatt Holding AG

The Andermatt Group

Andermatt Holding is a family-owned company with consistently growing employee participation.

The Andermatt Group aims to find practical biological alternatives to conventional chemical-synthetic pesticides, insecticides, fertilisers and veterinary drugs and make them available – for healthy food and a healthy environment.

Andermatt Biocontrol aims to achieve this objective by establishing a network of similarly aligned producing and distributing companies.
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Allocation of the individual countries:
The oriental fruit moth causes significant damage in Switzerland

The inexplicable damage patterns presumably assigned to the codling moth in recent years turned out to be infestation with the oriental fruit moth (*Grapholita molesta*). This pest caused significant damage in several peach and pear cultures in Switzerland for the first time in 2012.

BERTRAND GENTIZON, ANDERMATT BIOCONTROL

The oriental fruit moth (OFM) can potentially form four generations under the climatic conditions prevalent in Switzerland. Peaches and nectarines are the main host plants, but the pest also infests other fruit trees such as apple, pear and apricot. It is known from France and Italy that the oriental fruit moth develops either only on stone fruit or only relocates to neighbouring apple or pear orchards after their harvest. Only for a couple of years has it been observed that the oriental fruit moth can also go through its entire development cycle entirely on pomaceous fruit. The occurrence of the oriental fruit moth in Switzerland is nothing new. Moths have occasionally been caught in monitoring traps, but without ever having caused major damage to professional orchards. This changed abruptly in 2012, when commercially significant losses on peach and pear were noted in the canton of Vaud.

**Damage pattern**

The caterpillars of the oriental fruit moth infest the young shoots and the ripening fruits. The young caterpillars eat their way into the soft shoot ends and then bore a route down the branch. As soon as they reach harder, wooden sections, they look for new young shoots or infest ripening fruits. While the damage to the shoots can be clearly assigned (see picture 1), the damage pattern on the fruits can be confused with that of the codling moth. The differentiation is made more difficult in that the caterpillars of the two pests are apparently identical. The larvae of the oriental fruit moths often penetrate the chalice in apple and pear and eat their way making routes into the pulp. Contrary to the codling moth, the routes do not, however, necessarily lead to the core.

**Control measures**

Mating disruption is very effective to control the oriental fruit moth and has been successfully used abroad for many years. The pheromone components effectively used against the oriental fruit moth are the same as those used and approved against the plum fruit moth and the small fruit tortrix. ISOMATE® OFM ROSSO, ISOMATE C/OFM and ISOMATE CLR/OFM are the corresponding products. While OFM Rosso covers all 4 generations of the oriental fruit moth as regards the pheromone duration, the C/OFM and CLR/OFM dispenser types contain only just sufficient fragrance to cover the first two and part of the 3rd generation. The latter can be sufficient with a weak to moderate infestation pressure. For stronger population occurrences, as this was the case in some fruit orchards in the La Côte region, it is necessary to support the confusion technique with insecticide treatments (see chart 1). As is well known, Andermatt Biocontrol developed the baculovirus product MADEX® TWIN with effect against codling moth and oriental fruit moths. MADEX TWIN is the only insecticide that is currently registered in Switzerland against the oriental fruit moth. As such, this development and the license came just at the right time for Switzerland.

**CONCLUSION**

This year, the strategy presented above was recommended by Andermatt Biocontrol and successfully implemented by the fruit growers in the areas affected. In the coming years, it will be necessary to continue tackling the oriental fruit moth in these orchards. At the same time, the further development of the pest in all other regions will need to be monitored closely.
Comparison of the start of flight and the eclosion dynamics of codling moths in Valais (Switzerland) subject to various influences

The objective of this study was to compare the start of flight and eclosion progress of the overwintering generation of codling moth populations from various orchards in Valais. It was verified whether similarities can be found between the plots and whether there is any match with the calculation of the SOPRA model. The aim was to improve the time positioning of the plant protection measures with the findings gained. The hypothesis was that the actual start of flight is later compared to the SOPRA model, in particular in orchards with mating disruption.

RICHARD PELLISSIER, ANDERMATT BIOCONTROL

To verify this hypothesis, codling moth larvae from eight different orchards were caught and kept in a climate chamber under controlled conditions. For every plot, a moth eclosion graph was generated. These graphs of the populations of individual plots were grouped and compared. The analysis of the results did not yield any evidence regarding a delayed emergence of codling moths from orchards with mating disruption compared to those of plots without mating disruption. The comparison of the generated graphs with the SOPRA model was not possible, as all variants made of the flight curves – for reasons that are yet to be examined – showed far later eclosion times than the model.

However, the following tendencies were revealed from the data collected in the different production systems: integrated production (IP), organic and untreated plots (Chart 1):

– In orchards with chemical codling moth control (IP), the flight started well ahead compared to the other production systems. With 150 day degrees, the advance was considerable and remained until the end of the eclosion period.
– The emergence and flight of codling moth in orchards treated with organic insecticides was delayed.
– In untreated plots, the emergence was very similar to the ones observed in the organic treatment.

The early emergence of codling moth registered in the IP plots is a surprising result. Although these differences are statistically proven, additional trials with more plots are required in order to confirm these results. Further key parameters were not included in this study. The following three parameters should be included in a next study: apple variety, insecticide type, including number of treatments and infestation level of the pest in the previous years.

For producers, these results indicate that monitoring at the start of flight with pheromone traps is indispensable. In plots where mating disruption is used, pheromone traps do not work properly or not at all. One option to improve this would be to place the traps above the tree crowns and not only two metres above the ground. A reliable forecast for the start of flight and population development remains difficult. Evaluation of fruit damage continues to be an essential tool for the correct assessment of the codling moth population.

Source:
Pellissier, R., Comparaison du début du vol et de la dynamique de sortie de diapause des populations de carpocapses en Valais soumis à différentes influences, Travail de bachelor, Haute école des sciences agronomiques, forestières et alimentaires HAFL, 2013

Chart 1: Eclosion progress of the codling moth in three different systems: IP, organic and untreated.
Use of beneficial insects for strawberries and raspberries in greenhouse cultivations

Although berry cultivation has strongly shifted to greenhouse or tunnel cultivation, the implementation of beneficial insects has been slow so far. One of the reasons may be the producers’ attitude of using traditional plant protection products when solving pest problems in normal outdoor cultivations. This experience is automatically transferred to indoor growing, but it works only partly.

Advantages of indoor growing include prevention against fungal diseases as well as better quality of the fruit. On the other hand, there is an increased occurrence of thrips and mites. In hot and dry summers like 2013, these pests can cause extensive damage. Experiences in other crops (ornamental plants, vegetables) have shown that acaricidal action may be insufficient and because of long waiting periods, the use of acaricides is limited. For this kind of plant cultivation, the use of beneficial insects is a recommendable option.

Strawberries
The control of spider mites with Amblyseius californicus and Phytoseiulus persimilis works well and is easy to apply. The use of beneficial insects should be commenced if more than five winter females per 50 pinnate leaves are found. Two releases of three to five predatory mites per square meter are usually sufficient, but early identification of the spider mite is essential.

The impact of thrips control is less reliable. Usually, Amblyseius swirskii and Orius majusculus are established easily in strawberry cultures and are effective enough when thrips infection is moderate. However, in some areas extensive fruit damage is caused by the thrips species Frankliniella intonsa. This kind of thrips, flying in within a short period of time and in large quantities, cannot be controlled sufficiently with beneficial insects. In most cases, insecticide treatment is necessary although this is difficult with everbearing varieties. If regular bug infestation is expected, only predatory mites should be considered in the beneficial insect strategy. As a consequence of the necessary insecticide treatment, other kinds of beneficial insects (e.g. Orius or parasitic wasps) can suffer severe damage.

Raspberries
Raspberries differ in perennial and annual varieties. With perennials, an established population of Amblyseius andersoni is commonly found. When controlling secondary parasites such as raspberry beetles and raspberry cane midge, it is important to observe the adverse reactions of the insecticides used. Pyrethroids, or common acaricides, should be avoided. Predatory mites for controlling spider mites are used only when no natural opponents are present.

Annual raspberry varieties should be handled like strawberries. High infestation pressure can be met with potash soap (NATURAL) which can be used in combination with predatory mites.

Table 1: Evaluation of pest occurrence in greenhouse cultivations of berry crops and the efficiency of beneficial insects.

<table>
<thead>
<tr>
<th></th>
<th>Aphids</th>
<th>Spider mites</th>
<th>Thrips Frankliniella occidentalis</th>
<th>Thrips Frankliniella intonsa</th>
<th>Bugs</th>
<th>Tarsonemid mites</th>
</tr>
</thead>
<tbody>
<tr>
<td>Strawberry</td>
<td>● ● ● ●</td>
<td>● ● ● ● ● ● ●</td>
<td>● ● ● ● ● ● ● ● ● ● ● ● ● ● ●</td>
<td>● ● ● ● ● ● ● ● ● ● ● ● ●</td>
<td>● ● ●</td>
<td>● ● ● ● ● ● ● ● ●</td>
</tr>
<tr>
<td>Everbearing strawberries</td>
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<td>● ● ●</td>
<td>● ● ● ● ● ● ● ● ●</td>
</tr>
<tr>
<td>Summer raspberries</td>
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<td>● ● ●</td>
<td>● ● ● ● ● ● ● ● ●</td>
</tr>
<tr>
<td>Autumn raspberries</td>
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<td>● ● ● ● ● ● ●</td>
<td>● ● ● ● ● ● ● ● ● ● ● ● ●</td>
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<td>● ● ●</td>
<td>● ● ● ● ● ● ● ● ●</td>
</tr>
</tbody>
</table>

Efficiency of the beneficial insects

Pest occurrence: ● rare ● ● occasional ● ● ● frequent
Infestation monitoring and mass catching of *drosophila suzukii*

Traps can be used for infestation monitoring and mass catching of the cherry vinegar fly *drosophila suzukii*. The design of the trap is crucial for the relevant purpose.

**SAMUEL STÜSSI, ANDERMATT BIOCONTROL**

The use of drosophila traps has two objectives. At the start of the season, infestation monitoring is the main focus. A trap that catches as selectively as possible and where the differentiation of the drosophila caught is associated with as little work as possible is suitable for this purpose. For traps with a liquid bait, the accruing “insect soup” needs to be separated in cumbersome work before determining the species. To this end, tests are currently ongoing with a promising dry bait. The aim is to identify the first catches with as little work as possible and in a pleasant way.

After catching the first cherry vinegar flies, the objective is their mass catching. The traps used should be very attractive, but also as selective as possible. An assessment of the catch, however, is not the focus here. Our experience shows that the attractiveness of the trap mainly depends on the “evaporated” quantity of the bait with the same bait liquid. Compared to small-volume beaker traps, this year’s tests of Agroscope (chart 1) with the larger Drosotrap caught 2–3× more vinegar flies. To retain the attractiveness, the bait needs to be replaced every 7–10 days. In addition to the catch rate, however, the trap must also be a simple application. Here, a work process needs to be found which fits into the operational concept. To what extent the quantity, the form and the trap’s bait liquid significantly influence the catch figures is being established in further tests.

What method (mass catching, insecticides, attract and kill) will ultimately become the standard in fighting the vermin is yet to be seen.

**Source:** Richoz P., Baroffio C.; Agroscope, Centre de recherche Conthey

![Chart 1: Trap catches accumulated over a period of 6 weeks (2013); with the use of the same bait liquid.](chart1.png)

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*Drosophila suzukii – Are there alternative control measures?*

A new solution based on the principle of “attract and kill” could be effective to control the Spotted Wing Drosophila (*D. suzukii*).

**BERTRAND GENTIZON, ANDERMATT BIOCONTROL**

The Spotted Wing Drosophila (SWD) has certainly established itself in Western Europe and is causing damage to a large number of fruit cultures. Attempts are being made from various ends to find solutions in order to control this new pest. In light of the very short development cycle, standard insecticide applications are not satisfactory in the longer term. This is due to the high number of applications necessary with very short intervals and the residues on the fruit thereby caused.

Uwe Dederichs has developed an alternative control method based on the principle of “attract and kill” and tested it with initial success on the walnut fruit fly and cherry fruit fly. Tests were also conducted this year against the SWD. In doing so, a protein bait (Combi-Protec) is dissolved in water and mixed with a biological or conventional insecticide. This spray brew is then sprayed in large drops on the culture to be protected. The protein bait represents an attractive source of food for fruit flies. At the same time as the food, the pests take in a lethal dose of the insecticide. This method allows applying the insecticide on parts of plants where there are no fruits thereby leaving correspondingly less residue on the crops. The insecticide quantity per hectare can be reduced significantly, as it is contained in the drops in a concentrated form. Furthermore, a very small brew quantity (20 litres/ha) can be used.

If the initial results can be confirmed, the method could mark a great step towards an ecological and residue-free tackling of the SWD.
MADEX in the tank mix – less sensitive than previously thought

The miscibility of nine pesticides with MADEX® was tested in a semi-outdoor test. In doing so, the result of a previous laboratory study was further proven. The cydia pomonella granulovirus (CpGV) is less sensitive in terms of the reduction in its effectiveness by tank mixtures than previously thought.

MARTIN GÜNTER, ANDERMATT BIOCONTROL

To minimise the number of spraying rounds, it is beneficial for fruit farmers if they can deploy the pesticides in tank mixtures. For MADEX, the recommendation up until now has been that tank mixing should not be used for acidic (< pH 5) or basic spray mixtures (> pH 8.5). These “critical” values are either not reached or exceeded when combining with certain biological pesticides.

**Initial indications from the laboratory**

In laboratory tests at the Julius Kühn Institute (JKI) in Darmstadt (Fritsch et al. 2011), various preparations were examined in combination with cydia pomonella granuloviruses (CpGV). It was shown that even tank mixtures with pH outside the above critical thresholds have no negative impact on the effect of the granulovirus. But the question remained whether this also applies in outdoor conditions. Because it can be imagined that the extreme pH could cause a faster UV inactivation of the viruses.

**Semi-outdoor test**

Alongside Patrik Kehrli from the Agroscope research institute in Changins, Andermatt Biocontrol developed a semi-outdoor test and commissioned it, where nine tank mixtures were tested with MADEX PLUS (Massias et al. 2013). The impact on the effectiveness of the mixtures of MADEX PLUS was tested with the biofungicides MYCO-SIN (clay preparation) + wettable sulphur STULLN, VITISAN (potassium bicarbonate), BIOFA COCANA (coconut soap), copper, sulphur lime, with the chemical fungicides CAPTAN and DELAN and the bioinsecticide NATURAL (potassium soap).

The concentrations of the mixing partners in the spray liquid were quadrupled, which corresponds to a standard application in professional systems. The pH value of the mixtures was measured after stirring and then also 4 hours later directly before application. Apples were taken as samples at three different times after treatment (0, 5 and 11 days). A freshly hatched larva was placed on each apple. After 2 weeks at 23 °C, the infestation (damage and number of surviving larvae) was evaluated.

**Laboratory results confirmed in practice**

Only when mixing with sulphur lime a loss in effectiveness of MADEX PLUS was observed. In the spray liquid with sulphur lime, a pH value of 10.45 was measured before application. In contrast, the other mixtures with extreme pH values (NATURAL, BIOFA COCANA, MYCO-SIN + wettable sulphur STULLN) suffered no loss of effectiveness. Copper, of which a certain negative impact was expected in the past, also did not result in a reduced mortality of the larvae. These results correlate with those from the laboratory test of the JKI. It is known that extreme pH values can damage the granuloviruses. We therefore do not wish to issue a general approval for mixing with MYCO-SIN, BIOFA COCANA, NATURAL and copper. But in cases where only individual virus applications of a spray strategy in the mix with one of the above compounds are used, we can indeed recommend it.

**Source:**


<table>
<thead>
<tr>
<th>Mixing partner</th>
<th>pH in tank mix with MADEX</th>
<th>Miscibility</th>
</tr>
</thead>
<tbody>
<tr>
<td>Wettable sulphur STULLN</td>
<td>6.48</td>
<td>+</td>
</tr>
<tr>
<td>MYCO-SIN + wettable sulphur STULLN</td>
<td>3.42</td>
<td>(+)</td>
</tr>
<tr>
<td>VITISAN + wettable sulphur STULLN</td>
<td>8.00</td>
<td>+</td>
</tr>
<tr>
<td>BIOFA COCANA</td>
<td>10.29</td>
<td>(H)</td>
</tr>
<tr>
<td>Cooper</td>
<td>7.73</td>
<td>(H)</td>
</tr>
<tr>
<td>Sulphur lime</td>
<td>10.45</td>
<td>–</td>
</tr>
<tr>
<td>NATURAL</td>
<td>9.98</td>
<td>(H)</td>
</tr>
<tr>
<td>DELAN</td>
<td>7.40</td>
<td>+</td>
</tr>
<tr>
<td>CAPTAN</td>
<td>7.33</td>
<td>+</td>
</tr>
</tbody>
</table>

Table 1: Miscibility of MADEX in the tested tank mixes and the measured pH values (4 hours after stirring)
Strategies and prospects of Andermatt Biocontrol, focusing on development in international markets

Andermatt Biocontrol has enjoyed enormous growth over the last 25 years on the back of a consistently implemented strategy. The key factors behind the success of this strategy are continuity in the workforce and good, long-term collaboration with partners from production through to marketing. In recent years, equity investments and business start-ups have also been realised successfully.

Right from the start, Andermatt Biocontrol has always been more about innovation and development rather than marketing. That has enabled Andermatt Biocontrol to keep developing and bringing out innovations in the field of baculoviruses and beneficial organisms. The hurdles for registering baculoviruses have increased greatly in the last few years, particularly in Europe. Potential markets outside Europe are therefore becoming ever more important for us. The diversification into mouse-traps that are exempt from approval, achieved through the acquisition of Topcat GmbH, was thus an important step towards continuing to support the growth strategy followed to date.

It has long been policy to establish networks with other companies in bio-pesticides industry, on both the supply and the marketing side, through equity investments (cf. chart on the right). These are intended to ensure that we can service the various markets in the long term.

As for the future, Andermatt Biocontrol continues to see enormous growth potential across the world. It therefore intends to strengthen its position in key markets through its own subsidiaries or by means of equity investments. A step in this direction was taken in June 2013 with the formation of Andermatt Holland (cf. article page 15). There are plans to establish further subsidiaries in France and the USA in 2014.

The opportunity for staff to acquire shares in Andermatt Holding underlines the importance that Andermatt Biocontrol attaches to its independence and gives us employees the confidence of knowing that we can help to shape our own future.

Chart 1: Shareholdings of Andermatt Biocontrol shown on a timeline.
EXILON: product of a successful international cooperation

In order to develop a new baculovirus product, it is most important to possess adequate knowledge of the pest and virus. However, from the researcher's point of view, these issues are often connected too strongly to the applied research, and at the same time it is still very basic-oriented for SMEs. A joint research project between a research institute and a SME can help to remedy this problem. Within the framework of the EU-project BIOCUTBAC, it is now possible to acquire the missing knowledge and to develop a baculovirus product for the control of the widespread pest of cutworms.

HEIRI WANDELER, ANDERMATT BIOCONTROL

The development of new baculovirus products is always a major risk, and for financial reasons it is not possible for SMEs to conduct all the basic research. Instead, they have to rely on high quality research. However, there is often a knowledge gap between research and the industry, because from a SMEs perspective, applied research is still too far away from practice. This phenomenon prevents the development of useful products, even though some opportunities exist to successfully control certain pests with baculoviruses.

Cutworms of the species Agrotis, e.g., *A. ipsilon* and *A. segetum* are one example. Both are globally serious pests, and several baculoviruses have been described in literature as having an effect against cutworms. Professor Johannes Jehle, baculovirus specialist at the Julius Kühn Institute (JKI) in Germany, had already been involved with cutworms and baculoviruses. In summer 2012, a jointly submitted project application under the EUROSTARS programme was rated as worthy of subsidies and thus approved. EUROSTARS is the first European support programme for researching SMEs. Support is provided to market-oriented developments of new products, taking into account that in addition to the EU, national bodies are responsible for the largest part of the support. In this case, it is the State Secretariat for Education, Research and Innovation SERI for Switzerland and the Federal Ministry for Education and Research (Bundesministerium für Bildung und Forschung BMBF) for Germany.

In the meantime, the first of three project years has been completed successfully and the developments have advanced significantly. While the JKI provides specific molecular biology knowledge, Andermatt Biocontrol contributes its know-how in the field of production and registration. As such, stable rearings of *A. ipsilon* and *A. segetum* exist, the most active virus is determined and characterised and several small batches of the product were produced and passed the quality requirements.

First promising field tests were done in collaboration with Professor Daniel Potter of the University of Kentucky, USA. Equally important for the success of the project is the support of the entire research community working in the area of baculoviruses. Particularly noteworthy is the uncomplicated willingness of Professor Bryony Bonning of the Iowa State University (USA) to provide the desired baculovirus isolate for commercialisation.

Andermatt Biocontrol would like to take this opportunity to thank Johannes Jehle, Daniel Potter and Bryony Bonning very much for the good collaboration. Many thanks also go to the EU, the BMBF and the SERI for their financial support.
Andermatt Biocontrol invests globally in new approvals

The wider range of products for the international business led Andermatt Biocontrol to make greater efforts for product registrations.

PHILIP KESSLER, ANDERMATT BIOCONTROL

In recent years, Andermatt Biocontrol has been increasingly expanding its product portfolio for the international market. New markets can however only be developed, once the products are approved. Currently, Andermatt Biocontrol is planning and following up applications for more than 100 new registrations in over 35 countries. In 2013, thirteen new approvals for baculovirus products were obtained (see box). The increasing efforts for product registrations have led Andermatt Biocontrol to hire new staff for the registration department to cope better with the new challenges. Registering plant protection products is expensive and requires a lot of time. A quick market entry is particularly important for biological pesticides with their narrow market niches, to mitigate the high up-front investments. This problem is hardly recognised on a legislative level. In addition, the registration authorities often do not have the resources to process applications in a timely manner. Together with and within associations (IBMA), Andermatt Biocontrol is actively working on several levels to improve this situation.

NEW APPROVALS IN 2013

- MADEX® TWIN in Switzerland
- MADEX® TWIN in USA
- MADEX® TWIN in Ukraine
- MADEX® TWIN in Lebanon
- MADEX® MAX in Poland
- MADEX® MAX in Belgium
- MADEX® MAX in Slovenia
- MADEX® MAX in Austria
- CAPEX® in Italy
- CAPEX® in Belgium
- HELICOVEX® in Tunisia
- BOLLDEX® (≡ HELICOVEX®) in Namibia
- DIPLOMATA® (≡ HELICOVEX®) in Brasil

A successful virus workshop

Partners from five continents visited Andermatt Biocontrol to attend a workshop on MADEX® TWIN and HELICOVEX® last June, where they learned more about application strategies.

PHILIP KESSLER, ANDERMATT BIOCONTROL

Two new baculovirus products, MADEX TWIN and HELICOVEX, which have a great market potential worldwide, were recently introduced in the market. To support the launch of these products, Andermatt Biocontrol organised a week-long workshop at which distribution partners from Argentina, Australia, Korea, New Zealand, Russia, South Africa, Ukraine and Uruguay participated. Participants were given an insight into the development of baculoviruses. As a team, they analysed the most important characteristics of MADEX TWIN and HELICOVEX. Afterwards, the entire group traveled to major fruit-growing regions of Switzerland (Valais) and Italy (Emilia Romagna). The experiences gained using the virus products in pest control management strategies were discussed directly with the growers in their orchards. The workshop was a great success on all levels. All participants were able to learn more about the development and application strategies with MADEX TWIN and HELICOVEX. They also had the opportunity to share their own experiences in the use of MADEX TWIN and HELICOVEX with the other participants. We at Andermatt Biocontrol would like to thank our partners for their active participation and interest during this intensive week. Particular thanks go to CBC Biogard, which contributed to the organisation of the workshop. The success of this workshop inspires us to organize further similar events in the future.

Picture 1: From left to right: Young-Woo Lee (KR), Scott Brady (AU), Andre Fox (ZA), Massimo Benuzzi (IT), Tatiana Ilinova (RU), Rolf Dieckmann (ZA), Albina Shaiahkmetova (UA), Andrea Lupori (AR), Edith Ladurner (IT), Nora Mamprin (AR), Sebastian Chailie (AR), Fernando Delpiano (UY), Philip Kessler (CH), Deborah Britschgi (CH), Eduardo Vasquez (UY), Jim Walker (NZ), Wynne MacLellan (NZ), Nicolas Chiesa (UY), Stefan Senn (CH), Andre Schreuder (ZA), Alex Meier (CH), Andrea Braggio (IT)
Use of BOLLDEX (=HELICOVEX) and LITTOVIR in new markets

The market launch of HELICOVEX® and LITTOVIR® enables new pesticide solutions in tackling the cotton bollworm Helicoverpa armigera and the Egyptian cotton leafworm Spodoptera littoralis. Both larvicides are based on naturally occurring nucleopolyhedroviruses (NPV), which have a high host-specific virulence. At the same time, the environment and beneficial organisms are not harmed.

IRIS KRAAZ, ANDERMATT BIOCONTROL

LITTOVIR as a new component of the residue-free control of Spodoptera littoralis in southern Italian vegetable growing.

At the end of 2012, the vegetable producers of southern Italy were confronted with an unusually high level of infestation with the Egyptian cotton leafworm Spodoptera littoralis. In favourable autumn climate conditions, the pest causes huge yield losses, in the production of salad, spinach, strawberries, tomatoes, aubergines and peppers. In some cases, traditional insecticides no longer produce the desired results due to resistances. The Europe-wide first approval of a Spodoptera littoralis NPV therefore came at the right time. LITTOVIR is applied every 6 to 8 days after the hatching of the first larvae (dosage: 100 or 200 ml/ha). The virus product can easily be mixed with usual insecticides, fungicides or liquid fertiliser (if the pH value in the tank mix is between 5 and 8.5). In order to control further lepidopteran pest, a rotation or tank mix with Bacillus thuringiensis products is often chosen in Italy. As the active substance of LITTOVIR has no relevance to residues, the use of LITTOVIR provides valuable flexibility for the pesticide strategy for the export-led industry.

BOLLDEX market launch in South Africa

The African cotton bollworm Helicoverpa armigera is regarded as one of the key pests in numerous agricultural areas of South Africa. It is difficult to control it due to widespread resistances against chemical active substances such as organophosphates, carbamates and pyrethroides. Furthermore, Helicoverpa has a complex biological adaptability, which ensures the survival of the pest in unfavourable conditions. Seamless resistance management and the use of integrated pesticide strategies are therefore essential for successful plant protection.

The registration of the BOLLDEX virus preparation is highly important for the South African market. Producers require effective and residue-free insecticides, which they can use until shortly before harvesting in order to meet the high quality requirements in export markets. In the first sales season, BOLLDEX was mainly used in so-called high value crops (such as lettuce, apple and citrus plantations). Dosages of 200 ml/ha were mainly used on a weekly basis. While BOLLDEX replaced traditional insecticides in apple and citrus production, the virus preparation was used in lettuce production in a programme together with other insecticides. In addition, initial experience was made in arable crops such as peas or tobacco, where success with lower dosage was attained.

BOLLDEX (= HELICOVEX) has been registered in South Africa since 2013 in all arable crops. Further approval procedures are running globally. HELICOVEX is currently licensed in Italy, Greece, South Korea, Egypt, Tunisia and in Switzerland (as of October 2013). Final licensing in Russia and emergency licensing in Brazil is expected by the end of 2013.

Picture 1: Helicoverpa armigera on tomato

Picture 2: The FINAGRICOLA cooperative is a market-leading vegetable producer in Italy.
Yield assurance with RHIZOVITAL 42

One principle of integrated and organic plant production is a future-orientated crop management. The preventive use of RHIZOVITAL 42 is an appropriate way to avoid or compensate abiotic and biotic plant stress and to ensure yield.

RETO FLÜCKIGER, ANDERMATT BIOCONTROL

Negative site factors, insufficient seed quality and poorly planned crop rotation can cause yield losses, usually in combination with unfortunate weather conditions.

RHIZOVITAL 42 – a product containing the soil bacteria *Bacillus amyloliquefaciens* FZB 42 – preventively applied at planting or as a seed treatment, can help to compensate such negative influences. Many years of field experience and trial analysis show that RHIZOVITAL 42 increases plant vigour and root growth. Thus yield losses through pathogen pressure, soil salinity, drought and water stress are partly or fully compensated. In potatoes for example, the fungi *Rhizoctonia solani*, causes stem necrosis and black scurf on tubers, leading to significant financial losses due to reduced outer tuber quality. The preventive use of RIROZTVITAL 42 strengthens the plant and compensates these negative effects, resulting in increased tuber quality. This is for example of particular importance during unfortunate weather periods (Chart 1).

Soil salinity is a problem which is steadily increasing outside of Europe. Worldwide the problem leads to serious yield losses. A study from Egypt showed that the emergence rate for eggplants irrigated with salted water, increased three times where RHIZOVITAL 42 was applied. The increased root mass obviously enabled the plant to tolerate the salt stress better (Chart 2).

**Chart 1:** Influence of RHIZOVITAL 42 on marketable first class tubers with little or no black scurf (<1% of tubers’ surface). Source: ABiTEP GmbH, 2012

**Chart 2:** Influence of RHIZOVITAL 42 and salted irrigation water on the emergence of two eggplant varieties. Source: Bochow et al. 2001

**Chart 3:** Mode of action
Andermatt Biocontrol is active in rodent control

Andermatt Biocontrol has been active in the area of rodent control for about four years. The product range comprises the following three products: TOPSNAP, TOPCAT and STANDBY. An additional person has been developing the Swiss market since August 2013 thereby expanding the market presence.

ALEX MEIER, ANDERMATT BIOCONTROL

TOPSNAP – the indoor-mousetrap.
The TOPSNAP trap is the latest addition to the range of rodent control products. The trap was developed in collaboration with Jean Malevez and successfully launched in August 2012. It is a mechanical snap trap for indoor use e.g. stock rooms, storage areas, greenhouses, stables, residential houses etc. The trap distinguishes itself through its simple and safe utilisation and the high quality of materials used. All parts of the trapping mechanism are made of stainless steel. This is unique amongst the large number of snap traps. The TOPSNAP trap will furthermore be given a new design in the future. This design will complement the trap and meet the high expectations of our customers. Individual packaging further simplifies presentation at the numerous reselling outlets.

TOPCAT – the vole trap.
TOPCAT is a mechanical snap trap. The trap has been in the market for about 14 years and is well established. All components are made of stainless steel. The TOPCAT trap has set new standards amongst snap traps with regard to quality. The cylindrical trap is suitable for controlling water voles (Arvicola terrestris) and common voles (Microtus arvalis).

In recent years, a soft revision of the TOPCAT trap has been carried out: the new shape of the clamping lever ensures even better signalisation, showing whether the trap has been triggered or not. Furthermore, the setting process was simplified through minor modifications. The TOPCAT trap is individually packaged in a cardboard box. This packaging ensures a better presentation in the shop as well as easier handling.

STANDBY – the vole fence.
STANDBY is a system consisting of mesh wire fence, fastening materials and a live catch trap. The system prevents the migration of voles into a protected plot. Migrations, in particular of water voles, occur regularly. This behaviour results in the colonisation of new areas and prevents inbreeding within vole families.

By using a STANDBY vole fence, vole control within the plot is positively supported. The system works in cooperation with natural vole predators. They check the live catch traps regularly and empty occupied traps independently.

ANDERMATT BIOCONTROL IS EXPANDING ITS PRESENCE IN THE SWISS MARKET

In August 2013, Esther Manser has started her work as a rodent control specialist in the newly created rodent control division of Andermatt Biocontrol Switzerland. This allows Andermatt Biocontrol to further strengthen its presence on the Swiss market and to develop its competence in rodent control.
Andermatt Holland

Demand for environmentally grown, safe and healthy food is rising constantly. As the key growing area of vegetables and fruits, the Netherlands offers an interesting market for biological pesticides, fertilisers and auxiliary substances. Andermatt Biocontrol therefore founded Andermatt Holland BV together with Wijnand van Rossum in July 2013. Its objective is to market biological solutions not only for agriculture and horticulture, but also for the hobby area.

On an international scale, the Netherlands is often considered the world’s vegetable garden. With vegetable exports of more than 4.6 billion kilogram, the Netherlands is the global market leader. In fruit exports, the Netherlands ranks eighth globally with 2.5 million kilogram. Exports of flowers and potted plants are even greater than exports of vegetables and fruits put together. When considering how comparatively small the area of the Netherlands is, it is easy to imagine that apart from football, production maximisation is the most popular national sport. Without contemporary and environmentally friendly pesticides and fertilisers, that cannot be achieved.

The key export markets are led by the US, Germany and Russia. Supermarkets and consumers in these countries have the highest demands for quality and safety. It is therefore clear that environmentally-friendly production is a matter that interests every producer. It is, of course, expected from pesticide companies that corresponding products are developed and licensed. It is great to discover that Andermatt Biocontrol has a highly respected reputation even in the Netherlands in this regard. With Andermatt Holland, these products are to be brought closer to Dutch producers with competent advice.

Andermatt Holland will initially offer a limited range of products. The very well organised sales route of Madex Plus in Holland via Koppert and BASF will continue to exist on the basis of the very good cooperation. We plan to expand the offering in the future, so that further solutions for agriculture and horticulture as well as the biocide and hobby areas can be offered.

Andermatt Holland has its own webshop. The key partners for Andermatt Holland are, however, the major distributors in the Dutch market, who know their customers personally, have specialised knowledge on the products and can supply their customers from the immediate proximity. Andermatt Holland also offers its partners, in addition to high-quality products, professional support in advice and product marketing. Andermatt Holland is in turn supported by specialists from Switzerland.

We are convinced that we can offer our customers interesting solutions via Andermatt Holland.

Picture 1: Biological solutions for greenhouses, agriculture, fruit and vegetable growing
LOOPEX: a new biological control product for the cabbage looper, Trichoplusia ni

Sylvar Technologies Inc. anticipates the release of a new biological control product (LOOPEX) for the cabbage looper, T. ni.

STEFAN RICHARD, SYLVAR TECHNOLOGIES

By working closely with its research partners, including Agriculture and Agri-Foods Canada (AAFC), Sylvar’s R&D team has developed a biological control product (LOOPEX) for use against the cabbage looper. The active ingredient used in LOOPEX is the Autographa california nucleopolyhedrovirus, AcMNPV, and has been isolated during previous work at AAFC. The cabbage looper, is a highly migratory and destructive pest of a variety of crops (including most cruciferous vegetables) throughout North America. It is also widely distributed in the tropics and subtropics. In Canada, the cabbage looper is a major pest of greenhouse vegetables (tomatoes, cucumbers and peppers). This pest can cause losses in crop yields due to plant defoliation and by feeding directly on the crop’s fruit.

LOOPEX is expected to enter the Canadian market in time for the 2015 production season. It will offer a highly effective biological control tool for cabbage looper larvae while being compatible with any pest control program, including those focused on resistance management. Sylvar’s parent company, Andermatt Biocontrol and its partners, are anticipating bringing LOOPEX to markets world-wide.

SYLVAR TECHNOLOGIES

Sylvar Technologies Inc. is Andermatt Biocontrol’s Canadian subsidiary. Sylvar offers several product lines including:

Baculovirus based biological control products for:
- Lymantria dispar
- Neodiprion abietis
- Orgyia leucostigma
- Orgyia pseudotsugata

Pheromone based monitoring technologies for:
- Acantholyda erythrocephala
- Agrilus planipennis
- Heterocampa guttivitta
- Itame argillacaearia
- Tetropium fuscum
- And others

Picture 1: A healthy, late-instar cabbage looper (T. ni) larva.

Picture 2: A typical example of a cabbage looper (T. ni) larva succumbing to LOOPEX.
Fighting mould in an environmentally friendly and healthy manner

The LineaCasa mould remover recently expanded the range of environmentally friendly household products of Andermatt Biogarten. The product has various benefits compared to other trading products and “home remedies”.

JUDITH LADNER CALLIPARI, ANDERMATT BIOGARTEN

In many households, an ugly, grey stain can sometimes be seen on the wall, in a corner or in between tiles. As long as it remains relatively small (<1 m²) and limited, there is not much to worry about; the stain can be removed with a suitable anti-mould product. But what substance is suitable? As is often the case, the market offers a large number of products, whose labels all sound convincing. And then there are also the “tried-and-tested” home remedies: Javel water (bleach) or alcohol.

A short time ago, Andermatt Biogarten introduced such a product into its range, the LineaCasa mould remover. This is a ready-to-use spray made up of stabilised hydrogen peroxide and a small quantity of silver nitrate (<0.2%). This composition is also used by professional refurbishment companies in mould fighting. It has a quick and, thanks to silver ions with a catalytic effect, sustainable impact. The product is free from aldehydes, alcohols, chlorine/hypochlorite as well as quaternary ammonium compounds (quats). It therefore does not release any poisonous, inflammable or strongly smelling vapours. It has no gaps in its effectiveness, like quats for example, and in comparison to Javel water can be easily handled without danger. The hydrogen peroxide is also quickly broken down into oxygen and water.

To prevent mould from arising in the first place, the general rules must always also be observed:
- The relative humidity of the rooms should not exceed 55%.
- Pulse ventilation instead of slightly opened windows: open the windows wide at least four times a day for approx. five minutes and create a draft.
- The temperature of residential rooms should not be reduced too drastically; head bridges (badly insulated areas) should be rectified.

WHEN IS IT NECESSARY TO TAKE PROFESSIONAL ACTION AGAINST MOULD?

In the long run the do-it-yourself approach for mould-infested areas of more than 1 m², which are presumably caused by constructional defects, hardly promises to be a success, and is also connected with health risks. In such cases, it is advisable to consult a professional refurbishment company. This is because mould is not only unattractive, but can also have adverse health effects, such as inducing headaches, allergies and respiratory illnesses.
The end for fruit flies

JUDITH LADNER CALLIPARI, ANDERMATT BIOGARTEN

Fruit flies are a nuisance and – in particular as maggots in fruit bowls – rather disgusting. During the warm season they can often be found in large numbers in the house and can quickly turn fresh fruit into unappetising insect breeding beds. From 2014 this will no longer be the case. The new LineaCasa fruit fly trap cannot be compared to any previous product on the market. It catches multiple times the amount of fruit flies that standard market traps catch. Unlike many other traps, it is not highly effective due to a vinegar, an acetic acid or even insecticides, but due to a combination of various nutrients with hardly any perceivable odour and a simple glue trap. The trap is handy and practical, as it does not contain any bait liquid and therefore cannot leak. And, finally, the can's products can be replenished thanks to a refill set made from bait substance and glue trap.

The LineaCasa fruit fly trap shows that there are innovative solutions even for pervasive household problems.

Organic urban gardening?

Is urban gardening a new trend? No, urban gardening has been used for as long as there have been cities. Today, it is a dream to harvest fresh, juicy fruit and vegetables rich in vitamins in one's own garden. In previous years or in poorer cities the benefit was, or is, mainly the additional foods which consequently serve to ensure self-sufficiency.

RUDOLF INGOLD, ANDERMATT BIOGARTEN

During urban gardening, city areas are used for growing plants. Not only individual balconies or terraces are made green, but also unused areas such as traffic islands, flat roofs, vacant commercial halls and industrial premises. The well-known “allotments” are also urban gardening in a sense, only that they are tended to on specially provided land plots.

Urban gardening is also to some extent a form of political protest, a fight for a greener city. Many cities see this as a positive trend. After all, unattractive areas are cultivated and cross-cultural contacts are thereby established which support the neighbourhood and communal life. Some city gardens are also picking up on the trend by planting vegetable trees instead of ornamental trees and shrubbery. Most urban gardeners trend to their plants organically, which is also the most practical. With all organic seeds and plants, during breeding, collecting and growing, the robustness and resistances are already observed, so that healthy plants and fruit can preferably be cultivated without pesticides. The location and range of variety is, however, also a very important requirement for strong development in organic urban gardening. Andermatt Biogarten has various organic seeds and organic plants in its range that are very suitable for urban gardening. The range of organic seeds today is almost even greater than that of conventional ones, as many rarities and specialities are offered.

Fruits do not need to be done without, even when available space is very limited: miniature fruit or column fruit trees can be grown in buckets very easily and are therefore very popular for balconies, terraces or backyards. The Chinese berry WU-WIE-ZI (Schisandra chinensis), mini kiwis or the grass of eternal life (Gynostemma pentaphyllum) are very suitable for greening walls, fences or other partitions. Also nearly all bushes and herbs, which do not multiply from seeds, are available in organic quality. The urban gardens do not only please their owners; many other city dwellers also like them. They make a key contribution to climate protection and to boost biodiversity.

They are certainly making an increasing number of beekeepers happy with their city bees, given the large variety of plants, which is incidentally often bigger than in rural areas, and a very long season. Bees express their gratitude with high-quality honey that tastes good.
MAQS: Gel Pads of Formic Acid against the Varroa Mite

MAQS (Mite Away Quick Strips) are gel-pads based on formic acid. Marketing authorisation for MAQS as a veterinary medicinal product has been requested in various European countries. Thus, the beekeeper will have access to an additional product based on formic acid in the near future. After the honey harvest in 2012, Andermatt BioVet performed a field study on the efficacy of the MAQS strips in Swiss hives with half the dosage that is recommended for other hives. The efficacy of one MAQS was comparable to the efficacy of formic acid dispensers.

ROMAN ERNI, ANDERMATT BIOVET

The efficacy of two applications with one MAQS-strip was compared to the efficacy of two applications with formic acid dispensers (same time-point, dosage according to package leaflet of the dispensers) at three sites. The following three dispensers were used: Liebig (LD), FAM and APIdea. The duration of the treatments was seven to eight days. The time between the start of the two applications was 30 to 39 days. The small volume of the Swiss hive along with the warm orientation of the combs parallel to entrance facilitate the evaporation of formic acid. Therefore only one MAQS strip was used per application. The treatment consisted of two applications. Oxalic acid dispensed with VARROX-vaporiser or OXUVAR and the trickling method were applied to eliminate the remaining mites in the broodless colonies. The variation of mite infestation within the same apiary was remarkably high and differed up to factor of 15 between the colonies. The efficacy of the MAQS was comparable to the efficacy of the formic acid dispenser in all apiaries. All colonies treated survived the winter and started well into the spring of 2013.

The efficacy of the treatment was calculated as follows:

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\text{Efficacy [%]} = \frac{\text{Number of mites from summer treatment}}{\text{Total of all mites from all treatments}} \times 100\%
\]

Chart 1: Treatment efficacy
Queen loss was observed in two of the colonies treated with MAQS. As expected for formic acid treatments, the mortality of emerging bees increased slightly in all apiaries. The microclimate at the examination sites caused a higher variation in efficacy than the choice of the formic acid treatment method. In order to evaluate the different dispensers, the performance would need to be measured at the same sites.

The mite load for 2012 in all three apiaries was generally low to medium. A third treatment should be considered in years with high mite infestation, especially when using MAQS. The application of two MAQS in Swiss hives may increase the efficacy marginally. Nevertheless, the loss of two queens and the escape of many bees from one colony argue against a higher dosage. A foil stabilises the form of the MAQS gel and the formic acid is bound in the gel. The MAQS are easy, fast and safe to apply and to remove. They are well suited for use by bee-keepers with little experience in handling liquid acids.

Natural strategies for fly control in the stable

Beneficial insects are suitable for efficient house-fly (Musca domestica) control in various livestock housing systems. The use of dump-flies (Ophyra aenescens) and parasitic wasps (Muscidifurax raptorrelus, Spalangia spp.) facilitates a natural and long-term reduction of the house-fly population.

MURIEL KAUFMANN, ANDERMATT BIOVET

With warmer temperatures in early summer, the population of barn-flies rises noticeably. Flies do not only disturb livestock and humans but also cause decreased milk production and can even transmit diseases. This substantial financial damage can be prevented by the use of the house-fly's natural enemies. The principle is remarkably simple: The fly has many natural enemies. Birds and insects, such as dump flies and parasitic wasps, use them as a source of food. We copy this from nature and use these beneficial insects to specifically control the house-fly population in the stable.

On their hunt for food, the beneficial insects migrate to the hiding-places where the barn-flies reproduce and decimate the newly growing fly population. Depending on the live-stock housing system, different regimes of release are appropriate. The dump-flies live reclusive in the manure channels below the slatted floor. That's where the dump-fly larvae feed on the house-fly larvae, so that this bothersome pest cannot reproduce. The parasitic wasp preferably lives in the solid dung and straw. It stays hidden in the straw, is rather inactive and therefore does not disturb livestock or humans. The parasitic wasp stings the cocoon of the house-fly and lays its eggs in it. Instead of the house-fly, new parasitic wasps hatch from the cocoon.

During recent years, an increasing number of studies raised concerns over resistance development of flies against pesticides. The efficiency of conventional insecticides is decreasing and that in turn leads to increased costs. Furthermore, the effect of insecticides is only temporary and repeated insecticide treatments are necessary. Once the beneficial insects have successfully established a stable population, the limiting effect remains sustainably.

The use of beneficial insects has to be embedded in an integral concept of measures. The most effective reduction of house-flies can be achieved by repeated release of the beneficial insects every 2 – 3 weeks during the whole fly season. Fly traps, sticky bands and baits can help reduce the adult fly population. Every farm is unique in regard to the livestock housing system, the infrastructure, the work routine, the hygiene concept and therefore also the optimal regime of dissemination. In order to achieve the most successful fly control, we offer our clients individual consultation by telephone.
The development of maggot debridement therapy in Switzerland

Maggot debridement therapy (MDT) is a very efficient method for the treatment of chronic wounds. The secretion of medicinal maggots selectively dissolves necrotic tissue, disinfects the wound and stimulates wound healing.

URS FANGER, ENTOMOS

MDT has been well-known for centuries. A renaissance was seen in the 1980s, when antibiotic-resistant germs appeared in medicine. In the 1990s, the method also arrived in Switzerland. Medicinal maggots were then produced and sold by the Swiss Tropical Institute in Basel. Since 2000, there has been a patented method that allows the maggots to be applied to the wound in a sealed dressing. This makes the maggots barely visible from the outside, and handling the maggots has become very easy. Since 2009, Entomos AG has been the sole producer of medicinal maggots in Switzerland. The company sells the maggots via the sales partner company Medical Systems Solution. The maggots are applied in more than one hundred hospitals throughout the country. Additionally numerous general practitioners and wound experts in private wound outpatient centres are also working with MDT. In 2013 more than 1 000 wounds will have been treated with medicinal maggots in Switzerland. This represents a doubling in the number of treatments over the past four years. It is estimated that patients have a total of more than 300 000 chronic wounds in Switzerland.

Every chronic wound needs to be cleaned and disinfected. The treatment of chronic wounds costs our health care system about CHF 500 million every year. The number of wounds and costs for wound treatment will continue to rise quickly in the future. The reasons for this are, on the one hand, the demographic development (ageing of the population), as well the increase in chronic diseases such as diabetes, which often result in chronic wounds. It is therefore expected that this will also further increase the number of treatments with Maggot Debridement Therapy.

Chart 1: Biosurgery: Wound healing through the use of medical maggots.