The newsletter on soil pest management

OUTPUTS AND MESSAGES FROM THE LAST SOIL DISINFESTATION SYMPOSIUM (SD 2018)

POTATO CYST NEMATODES INCREASED VIRULENCE: A HUGE ISSUE

CYPERUS CONTROL: ACCOLADE® 99 AL (DMDS) CONFIRMED ITS PERFORMANCE IN FRANCE

BASAMID STEWARDSHIP FOR SUSTAINABILITY

EVENTS AND CELEBRATIONS
Interview with the convener Prof. Eris Tjamos

The International Society of Horticultural Science (ISHS) is a truly global network including over 60,000 universities, governments, institutions, individuals, libraries and commercial companies. It is a major source of up-to-date information on global horticultural research. ISHS aims to promote research in all branches of horticulture and the development of international co-operation, bringing together scientific and technical professionals.

The aim of the ISHS is also to facilitate cooperation and knowledge transfer on a global scale through its symposia and congresses, publications and scientific structure. Invited speakers present papers, research findings are debated, discussions held and the publications are collected in a volume of Acta Horticulturae. The entire library is available online and services the needs of thousands of researchers worldwide who use the www.actahort.org site.

SYMPOSIUM ON SOIL DISINFESTATION

The IX international soil disinfestation symposium was held recently in Crete. Certis Europe interviewed Eleftherios Tjamos(*), President of the Hellenic Society of Phytiatry.

- Professor Tjamos, can you share some more details and information on its organization and participants?

“The IX International Symposium on Soil and Substrate Disinfestation, organized by the Hellenic Society of Phytiatry, the International Society of Horticultural Sciences and the Agricultural University of Athens, Greece, was held in Heraklion, Crete, Greece, from 9 -13 September 2018. The primary aim of this International Symposium was to promote and highlight current world research developments and applicational activities related to soil and substrate disinfestation by providing the podium to several invited lectures along with oral presentations, a poster session and a really important round table discussion. Over 140 scientists and accompanying persons from 22 countries around the globe participated in the congress. Indeed, as organizers we succeeded in attracting participation of a quite diversified group of scientists, coming from USA, Canada, Martinique, Australia, China, Japan, Singapore, Indonesia, Turkey, Israel, South Africa, Morocco, Belgium, Germany, Greece, Italy, France, Poland, Romania, Spain, Switzerland, and Netherlands. Participants from China, USA and Greece were the most highly represented groups”.

- Which were the key topics covered and debated during this event?

“The Symposium was opened by Prof. J. Katan from Rehovot, Israel, who gave the opening lecture on the Milestones and future expectations of soil disinfestation after forty-five years of soil disinfestation symposia (1973-2018), followed by Giovanna Gilardi, Torino, Italy, on Emerging soil borne pathogens and trends in their management. The scientific sessions included current hot topics based on research and application around the Globe. So the three days of scientific program were devoted to Anaerobic soil disinfestation(1); Soil disinfestation and beneficial microorganisms(2); disinfestation against nematodes(3); soil solarization, biosolarization, biofumigation and non-fumigant soil disinfestation technologies(4); Soil disinfection technologies(5); dimethyl disulphide (DMDS)(6); The phase-out of methyl bromide under the Montreal Protocol(7); Cultural practices and combined control measures(8) and Resistant cultivars and grafting for soil borne disease management(9)

- Which are the key trends in soil disinfestation research emerging from this symposium?

“The key trends referred to anaerobic soil disinfestation and also soil disinfestation and beneficial microorganisms. The old but still significant methods of soil solarization along with biosolarization, biofumigation and non-fumigant soil disinfection technologies were also presented. Several papers were focused on dimethyl disulphide (DMDS), while the contribution of resistant cultivars and grafting for soil borne disease management was also emphasised”.

- The Crete symposium also hosted a round table on regulatory issues in the EU for the registration of soil pesticides, particularly fumigants. What is your opinion on the value of such scientific discussion linked also with the availability of registered products in our countries?

“Yes, a round table discussion devoted to the future of soil
Interview with the convener Prof. Eris Tjamos

disinfection in the European regulatory climate was also organized.
The Moderators were Prof. Jacob Katan from Israel and Mrs. Francesca Ydraiou from the Greek Plant Protection, while Peter Smits, Independent advisor (Netherlands); María Del Mar Guerrero Díaz, Imida Murcia (Spain); Massimo Pugliese, University of Torino (Italy); and Sotirios Tjamos, Agricultural University of Athens (Greece) participated in the discussion.
The clear message from the scientific community meetings that chemical soil disinfection is still a very important tool, needed to maintain a financially sustainable production of intensive crops in Europe and in the rest of the world was especially emphasised during the round table discussion.
It was also underlined that the EU registration system, according to the Regulation EC 1107/2009, is over-complex and conservative.
The current system should become more pragmatic and risk-based and regulators should have contact with the real agricultural world”.

- After the symposium you also organized a national technical day with Greek technicians, specifically to convey the messages coming from the symposium itself. We believe this is a very good initiative bringing the research outputs to the grower level. Can you share with us what were the key messages transmitted to the field technicians?

“This post congress scientific meeting was organized on September 14 by the Hellenic Society of Phytiatry and the Plastika Kritis. It was addressed to agronomists and producers of the country to provide updated information on global and Greek developments in soil disinfection research and application.
Speakers and topics were focused on CleanStart in Greece (Smyrnakis from K&N Efthyimiadis); Integrated soil disinfection management with chloropicrin and its re-approval procedure in the EU (A. Kalamaraki from Alfa and Jan Pecina, Tris international); Varieties, hybrids and rootstocks of vegetables (C. Lavdas: from Rijk Zwaan); New plastic for greenhouses and soil disinfections (D. Doukas from Plastika Kritis); Global data on anaerobic soil disinfection (E. Markakis); Control of bacterial cancer of tomatoes in the greenhouse (D. Goumas); Soil disinfection in the Peloponnese periphery (A. Paraskevopoulos); Recent achievements on Soil solarization application in Greece (E.C. Tjamos) and presentation of Agris, a modern seedling production company (C. Metaxas)”.

- What advice do you have for the convener of the next soil international symposium?

“The convener of the 10th International Symposium on Soil and Substrate Disinfestation should make an early start on organizing, publicizing and promoting the congress among research institutions, Universities and private sectors working on the topic. Obviously, individual leading scientists in the topic of soil disinfection should be invited to be responsible for forming the international scientific and organizing committee and providing consultancy to the convener and local organizing committee. They should also definitely involve leading chemical pharmaceutical companies both in this organization and in the program itself. Finally, they should organize a technical visit to typical agricultural production areas, where soil disinfection is extensively investigated and practised”.

(*) Eleftherios (Eris) Tjamos, Emeritus Professor, Agricultural University of Athens Department of Plant Pathology 75 Iera odos str. 11855 Athens Greece. Convener of IX SD2018 and President of the Hellenic Society of Phytiatry.
Summary conclusions of the Round table
“The future of soil disinfestation in the European regulatory climate”

The 9th International Symposium on soil and substrate disinfestation was held in Crete, Greece, in September. Scientific experts of the International Society of Horticultural Science (ISHS), discussed the important challenges faced by European growers due to the lack of plant protection solutions for an effective control of several soil pests, most of all nematodes, and some critical weeds.

The round table discussion focused on a huge number of concerns:

- The needs for various tools for soil disinfestation (SD) in the light of the limited arsenal of SD tools and especially after the methyl bromide phase out, were thoroughly discussed.

- The lengthy European registration process of new plant protection products and the cautious approach of EU regulation, as well as restrictions imposed, has led to a reduction of active ingredients available in the past 10 years.

- Following the implementation of Regulation EC 1107/2009, the only tool available to fill the gaps in local production systems, is Art. 53 of the above-mentioned Regulation, which provides “derogations” for exceptional authorizations of plant protection products. Such authorizations increased exponentially in past years.

- The above-mentioned EU Regulation has a high socio-economic impact on various production systems in Europe and the Spanish case shows clearly the importance of maintaining a sustainable agricultural activity in local communities that, in the case of protected crops area, includes 13% of the active population employed in agriculture.

- Several European agricultural sectors are affected as the EU authority is allowing increased importation from extra-EU countries, considered unfair competition due to the more flexible registration system for plant protection products than that of the EU.

- To compensate for this disruption, more effective and faster evaluation systems are needed, especially for naturally occurring and low risk products (biological, plant extracts, etc.). That is, all products which are essential for Integrated Pest Management (IPM) programmes.

- There is also a miscommunication on plant protection products. Indeed, consumers, in most cases, are not aware that producing without chemistry would lead to substantially reduced productivity and would increase end produce price, as demonstrated by several studies.

- The various approaches for coping with regulations and for providing a much needed additional SD tools, were addressed. These include, among others, combining methods of control and improved SD application. The need for intensive and thorough research on SD tools was emphasized.

- The scientific community is making very important progress in balancing the use of chemistry with different techniques, as well as in understanding all those factors influencing the efficacy of such techniques themselves. Knowledge transfer from research and dialogue with the political and regulatory communities is still a key area for improvement, particularly in Europe.

The clear messages from scientific experts meeting at the Symposium is that these issues must be correctly addressed to all levels of stakeholders, in a way that all available tools, including sustainable use of soil disinfestation, may be used in a combined IPM system to allow sustainable production.

Nicola de Tommaso, Portfolio Lead
Arben Myrta, Product Development Manager
CleanStart portfolio, Certis Europe
Introduction

Potato yields can be severely reduced by infestation of Potato Cyst Nematodes (PCN), which is the common name for the nematodes Globodera rostochiensis and Globodera pallida, also called respectively Golden nematode and White nematode. Due to the high impact of these parasites on the crop, they must be monitored carefully to prevent and counteract their growth.

For instance, in the Netherlands a huge number of fields are frequently sampled to check the presence of PCN. If fields are infested, the best strategy to control these nematodes is the adoption of PCN-resistant potato varieties.

Varieties: the right choice

The choice of the right variety must be made according to the local nematode pathotype, as both these parasites may develop a specific ability to multiply on some specific clones and potato hybrids. Depending on their specialization, the variety resistance must be tested on the specific pathotypes found in the growing area. Therefore, growers may eliminate PCN infestations by choosing the potato variety that shows the highest specific resistance. Nonetheless, some exceptions may occur.

Increased virulence

Unfortunately, in recent years several potato fields showed the presence of some particularly virulent PCN populations, which have been able to adapt to the existing resistant potato varieties: worrying evidence that involves both Globodera rostochiensis and Globodera pallida. This means that even when choosing resistant potato varieties, growers run the risk of an increase in PCN, if nematodes have broken their specific resistance genes.

HLB is a Dutch company focused on research and consultancy in agriculture. Based on voluntary sampling, HLB noticed an increase in fields infested with PCN populations, which show higher virulence to previously resistant potato varieties. This trend has also been recorded in neighbouring countries of the Netherlands, so a virulent PCN population must be addressed on a wider scale than expected. As a matter of fact, for starch potatoes multiple resistant varieties have enormously reduced the problem over the past 20 years, until the recent appearance of new virulent pathotypes. New resistant varieties are fortunately expected in the near future, both for starch and ware potato varieties.
Potato varieties resistant to Potato Cyst Nematodes has been the best way to control parasite infestation - until now...

Control Strategy

Actually, blind confidence in resistant varieties is not sufficient anymore. For profitable potato production, it is very important that growers keep monitoring their fields to look for PCN, even when they think they have grown a resistant variety.

When an increase of PCN is observed on assumed resistant potatoes, then further tests are needed. These tests are more specific than standard ones and must be conducted to take the right decision about which variety to grow. HLB recommends doing a so-called “variety choice test”. It means collecting 2-3 litres of soil from a severely infected PCN spot: the so called “hotspot”. Then, in the laboratory cysts are separated from the soil and crushed. Eggs and living larvae are then inoculated in small containers (60cc) with PCN free soil.

In these containers, one small potato tuber – in total 8 varieties are tested: 1 standard susceptible variety, and 7 other test varieties, with a diameter less than 25 millimetres – is planted. In the same way, a series of different varieties are planted in similar pots. As a consequence, these tubers develop roots, which will be attacked by the inoculated PCN population. After some weeks, the number of newly formed cysts on the roots are counted. Based on the number of cysts, the resistance level of the particular variety is assessed.

Using this method, the farmer can understand which variety has best controlled the population in his field, but also which variety must not be grown in the same area. HLB is the only laboratory able to offer this “variety choice test” to farmers. But, if even this test should find no varieties with good resistance levels, then farmers must introduce alternative countermeasures, such as longer crop rotation for potatoes, granular nematicides and soil fumigants or inundation of fields.

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Cyperus Control: Accolade® 99 AL Confirmed Its Performance in France

Heavy infestation of Yellow nutsedge (Cyperus esculentus) with huge damage for the crop

Sometimes Cyperus esculentus, also known as Yellow nutsedge, produces such major infestation that it is difficult to distinguish crop from weeds. When this happens, the loss at harvest may be almost complete. That’s why effective control of this weed must be guaranteed using the most suitable tools available on the market.

This is exactly what happened in France during the 2018 season, where for the first time it was possible to use, on a large scale, Accolade 99 AL, the DMDS based product provided by Certis Europe B.V., the Ministry of Agriculture has granted a derogation for exceptional use for specialty crops to fight against this extremely harmful weed.

By the spring, this temporary authorization allowed the local association of nursery foresters to apply the product on a total surface of 24 hectares with excellent results.

Currently, the damage from Yellow nutsedge is such that tree and shrub growers can spend up to 60,000 euros per hectare to protect their crop. Despite their high value on the French market, these costs look unreasonable.

Indeed, repeated weeding with chemicals, mechanical equipment and daily labour have such an impact that one French owner was led to consider whether to abandon the 100-hectare plot he bought 15 years ago in the sandy Landes (south-west of France near Bordeaux). This was before he could take advantage of the benefits from DMDS applications.

Cyperus density has been estimated at 820 tubers per cubic meter, 92% of which are in the first 20 cm.
Heavy infestation of Yellow nutsedge (*Cyperus esculentus*) with huge damage for the crop

This producer already knew the very encouraging results obtained by Certis France on experimental plots, heavily infested with Yellow nutsedge so, without further testing, he approached the Certis team asking them to prepare a strong derogation file, compliant with EU article 53 eg. 1107/2009, in order to obtain this temporary authorization from the French authorities. This work has been more difficult than expected, due to the huge amount of technical information to be collected and submitted to political decision-makers, but at the end of this process the long-awaited official document finally came. Results followed quickly: after the product was injected below the barrier film, contact between the active ingredient and the weeds was extended for a few more weeks. In the end, the performance of Accolade 99 AL showed excellent and uniform results over the 24 hectares treated. Wherever the barrier film was maintained for two weeks after treatment, an efficiency of between 95 and 100% was observed. Tuber mortality also confirmed this outstanding performance, boosting the farmer’s enthusiasm not only about dmids on Cyperus, but also on other weeds present during the fumigation process, like purslane and crabgrass.

As a consequence, waiting for the final approval of Accolade 99 AL, he has already started working to support a new derogation request for 2019. But he is not alone in this attempt. Indeed, these results have been brought to the attention of all French producers concerned about infestations of Yellow nutsedge and they regularly contact the Certis France team to consider, for their own sector, another derogation on this problematic target.

This is great news, however, which comes at a time when fumigants are being mediatically exposed to several metam sodium poisonings and derogation refusal of 1,3-D. The farmer therefore hopes that derogation requests for Accolade will be evaluated rationally, instead of emotionally, as can often happen.

Philippe Sunder  
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![DMDS application on a plot of 9 hectares.](image)
From the time of the CleanStart program launch, stewardship and sustainable use of fumigants were considered by Certis Europe as two of the most important aspects for an innovative approach to integrated soil pest management, as well as to soil fertility care.

Since the beginning, Certis Europe has always been committed to sustainable and responsible use of fumigants, investing also in specific training programs focused on the best application practices and responsible uses. These programs have been targeted both to technicians and growers, to whom new techniques for fumigant application and innovative machines and tools introduced in the fumigation market (e.g. Totally impermeable film) have been transferred.

The main goal of these efforts was to maximize the effectiveness and safety of fumigants, meanwhile also reducing exposure for operators, residents and bystanders both during and after chemical soil fumigation and cutting down the environmental impact of fumigants. Indeed, some poor application of metam sodium, not carried out by professionals in November 2018 in an open field in France, caused intoxication of several residents and this led the French Government to withdraw all products based on metam sodium itself.

What happened in France confirmed the strengthening of our commitment to defend professional and responsible use of soil fumigants. Indeed, the withdrawal decision regarding all products based on this MITC generator is largely the result of a misuse of the product by occasional applicators not mastering the specific characteristics of the active ingredient.

Lack of training and especially use of inappropriate application equipment could lead to repeated cases of intoxication of residents in a context of increased pressure from green parties, pushing to prohibit pesticides. Fumigants, due to their toxicological classification and very high dose rate, have become the third target for ecologists after glyphosate and neonicotinoid insecticides. They are regularly reported in regional and national media.

Thus, considering that a derogation for 1,3-D is not always granted and metam sodium is included in the list of candidate active ingredients for substitution, dazomet remains a certainty for all the European growers. For instance, right now dazomet is the only fumigant authorized in France thanks to Certis Europe stewardship actions to prevent any incident and to promote the sustainable use of this product.

The application equipment is therefore a very important lever always to make fumigations with Basamid safer, whilst also preserving the highest level of efficacy.

Basamid is currently sold in several European Countries where the needs of farmers have to be covered with a “tailor made” approach. Indeed, different countries require different kinds of applications and different types of Basamid equipment. All equipment supported by Certis Europe for Basamid application must allow operators to work safely, minimizing contact with the product and delivering it homogeneously into the soil, always ensuring the right dose to maximize efficacy.

Nevertheless, Certis Europe tried to customize application equipment in response to different growers’ needs, particularly for the high value crops market, where growers are oriented to get top efficiency and quality of distribution with machines powered by a tractor power take-off (PTO) and a distribution system with electronic control. Otherwise, for extensive open field crops, many growers are looking for easy to use, robust and cheap equipment hauled by low horse-power tractors. In fact, several “home made” application machines were developed directly by growers, causing unsatisfactory homogeneity of distribution which led to insufficient efficacy.
Certis Europe was able to propose different application equipment thanks to a very fruitful partnership with Kanesho Soil Treatments, Forigo Roteritalia and other companies.

One of the first and high performance machines introduced in Europe was Mix Tiller Dry (MTD) by Forigo Roteritalia.

MTD is available in different work widths, suitable for different horse-power tractors and it is based on a stone burying technology work system. Product distribution is driven by a pneumatic flow, powered by an electric turbine and it is managed by an on-board computer able to adapt speed and distribution. The product is therefore applied by a front distribution bar and is then mixed into the soil by rotovator. Moreover, a hydraulic roller installed in the rear ensures good soil sealing to reduce the escape of the MITC gas. Last but not least, a plastic layer device can be installed for barrier film mulching, in order to ensure further product efficacy.

**ADAPTING TO ALL NEEDS**

Though MTD is highly effective, many farmers need simple machines for Basamid application in the open field, where several hectares must be fumigated every day. Moreover, the cost of the equipment is a very relevant point, so farmers prefer cheap and easy to use equipment. In response, Certis Europe supported different companies in developing new application concepts of tillers. Indeed, the tiller distribution system is cheaper than PTO equipment, it is user friendly and ensures good quality of distribution with very low operator exposure.

The tiller concept is based on a common vibroflex tiller chassis connected to a hopper where Basamid is uploaded. The product is injected and mixed into the soil by shank (vibroflex blades) connected to the distribution system by deep tubes. The first tiller equipment for Basamid distribution was the “Tiller Spreader” by Sandon Officine Meccaniche.

It is not PTO powered equipment and it is based on an easy to use mechanical distribution system equipped with microgranulator gears. The distribution system is powered both by the rear roller movement, for good distribution quality, and soil rolling. The more robust Tiller Spreader version is available for application in medium to heavy difficult soil.
Solid and strong stewardship is mandatory for the sustainable use of Basamid®. Effectiveness, safety, respect for health and environment are the keywords of our project.

A new step forward for easy Basamid application is the “4me” tiller by the company Idrogeotech. The “4me” is based on the same tiller concept described above, but is more technologically advanced. The “4me” distribution system (under patent) is very innovative and completely different from the microgranulator ones, ensuring higher performance and distribution quality than the “Tiller Spreader” with easy electric dose rate settings connected to the rear roller, in a way to calibrate the rate proportionally with the tractor speed. Moreover, a high performance plastic film layer device can be installed at the rear of the equipment for soil barrier film mulching.

Other new innovative equipment will be developed in the coming years under Certis Europe’s supervision for different and more specialized Basamid applications. Right now Certis Europe has provided farmers with all the best in terms of application practices, innovative IPM techniques for combined uses of Basamid fumigation with integrated tools (e.g. solarization) and, last but not least, innovative and “tailor made” equipment for any need. That's why Certis Europe is more than ever focused on the respect of Best application practices, with its stewardship program for sustainable and responsible use of fumigation: the only way of working for modern soil chemical fumigation and to defend registration of fumigants at European level.
2nd ISHS Carrot and other Apiacee Symposium

10 days after the IX International symposium on soil and substrate disinfestation in Crete, Certis Europe had the opportunity to share its CleanStart sustainable approach for soil fumigation at the 2nd Carrot and other Apiacee Symposium that took place in Krakow (Poland) on 19-22 September 2018. The Symposium was organized under the aegis of the International Society for Horticultural Science (ISHS). The mission of the symposium was to bring the most recent scientific findings and technical advances to the worldwide community of carrot researchers, breeders, technicians, growers and industry.

Certis presented a technical-economic study on “Sustainability of Southern European carrot production in relation to fumigation practices”; the aim of that scientific study was to underline how important a very effective chemical fumigation is as a part of an integrated pest management program for the control of the most relevant soil pests, mainly nematodes and Cyperus. Chemical soil fumigation carried out with an innovative active ingredient such as Dimethyl Disulphide (DMDS) is still a very important tool needed to maintain financially sustainable production of intensive crops in Europe and the rest of the world. All the alternative solutions to chemical fumigation for soil pest control (crop rotation, agronomic practices, biological and biorational products) currently available are only effective as tools to be included in IPM based on chemical fumigation. Right now, without chemical soil fumigation the cultivation of several crops in Europe may not continue in the future because they would no longer be sustainable. It would lead to dramatically reduced productivity, would increase end produce price and would cause the loss of several thousand jobs.

At the end of the Scientific session the Certis approach to sustainable soil pest management was discussed and really appreciated by the attendees.

Kanesho Soil Treatment 15th anniversary

Kanesho Soil Treatment (KST) is Certis’ sister company, born as a joint venture between Agro-Kanesho Co. and Mitsui & Co. Agro-Kanesho is a leading Japanese agrochemical company involved in research and development.

On the other hand, Mitsui & Co. is the major Certis’ shareholder and represents a large Japanese conglomerate with well-established global operations and network, pursuing business in several sectors through the development of major international infrastructure and investments.

Kanesho Soil Treatment maintains registrations and supplies Basamid® and DD® products in over 90 countries worldwide and its global business expansion is being highly supported by its joint-venture partners, specifically by Certis in Europe.

KST was formed at the end of 2003 and is situated in Brussels, Belgium. In September KST celebrated the 15th anniversary of its foundation and Certis was invited to attend the celebration, joined by Japanese and European management of both companies. Certis contributed by presenting the CleanStart strategy in which KST products are a key element.
CleanStart is an innovative and unique soil pest management program. Best technologies and professional expertise at farmers’ service. The way to achieve the best farming results in a safe and sustainable way.