Organic-PLUS WP3 and WP5 Webinar 21st October 2020

Questions to, and Answers from, Presenters

This document provides a summary of the questions (**Q**) for presenters at the Organic-PLUS WP3 and WP5 Webinar on 21st October 2020, and the answers (**A**) which presenters have partly formulated after the event.

Miguel de Cara, IFAPA
How to replace copper in organically managed tomato greenhouses?
Q from Erica Montemayor, IRTA: Does gluconic copper have lower mammalian toxicity and ecotoxicity than other copper plant protection products like copper oxychloride, copper sulphate, etc, when exposed to the residues?
A: This was not something Miguel has investigated

Qs from Sabine Zikeli, UHoH: 1) Do you also have experiences with other diseases e.g. early and late blight with these products? 2) Is it a problem with potassium bicarbonate and lime sulfur on pH and inputs of nutrients in the greenhouse? This might be a problem because there is a lot of inputs of ions that might make a problem with salinisation?
A to 1) I have experience *in vitro* with another tomato pathogen ***Fulvia fulva***, and **Cinnamon Extract** (https://www.researchgate.net/publication/235888989_Efecto_fungicida_del_sulfato_de_cobre_y_del_extracto_de_canela_frente_a_Fulvia_fulva_agente_causal_de_la_Cladosporiosis_del_tomate).
A to 2) In the greenhouse we have tested potassium bicarbonate (PB), but not lime sulfur. Regarding PB, some advisors have observed a sort of unbalance with potassium (K), when analysing sap. I have not measured it personally, but the effect of K has to be taken into account, in fact we applied the low application rate, thinking on this effect. With the low rate we have not observed any difference to control plants. In our area salinisation problems are due to sodium (Na), that's why no one uses sodium bicarbonate

Erica Montemayor, IRTA
Life-cycle analysis of organic tomato production with less (or with no?) inputs of peat and plastic

Q from Sabine Zikeli, UHoH: If biodiversity would be included in the assessment of the compost and peat, the compost would be a clear winner, I assume. So will this be included in the assment? It doesn't work with a "normal" LCA but maybe there are other ways?
A: A (European-centric) guidebook has been released recently which Erica will be using, to explore other methods to include biodiversity.

Q from Anna Bogush, CU: Did you consider end of life management (e.g. utilisation) of plastic films after their use in your calculation?
A: We only considered the machinery processes needed to remove the plastic (tractor) and the transport to the waste treatment facility. We did not include the waste treatment processes as we were unsure what treatment was done with used plastic mulch. However, we will include different End of Life scenarios in the final results.

Georges Nanos, UTH
How to phase out the use of copper in organic growing of olives?
No questions

Gabriella Cirvilleri, UNICT
Biological control of disease in organic citrus growing
Q from Sabine Zikeli, UHoH: There were fixed application intervals in the trials. Are there any attempts to create prediction models for the disease spread to optimize the timing of the applications of Cu and the other products? Or does this make no sense in your climatic conditions?
A: Yes, prediction models for diseases spread of *Colletotrichum* spp. and *Alternaria* spp. are available in Spain and USA, in areas characterized by different environmental conditions. These prediction models could be validated and optimized in our environmental conditions, and trials will be planned in the future.

Jens Hansen and Isaac Abuley, AU
Can we control blight disease in potatoes by adapting decision support systems?
Q from Tony Little, Innovative Farmers: One the key barriers to introducing resistant varieties is in the supply chain and marketing. Have you been able to get retailers/ packers in Denmark to accept and sell resistant varieties and if so how?
A: Some brands grow special potatoes in certain regions. They do not use the variety name. There is a project in Netherlands that has invited stakeholders to take up this key issue.

Sophie Valleix, ABioDoc
French trials to phase out contentious inputs- available resources in a literature database

Q from Ishita Ahuja, NORSØK: What is the name of literature database and what kind of information can be made available through this database?
A: The name of the database is the Biobase. Biobase is the only French speaking documentary database specialized in organic farming. In this database, you can find information on all subjects relevant for organic farming such as technical information on all productions (crops and animal husbandry), market and consumption, regulation, but also societal aspects, environmental and territorial information. Many documents are technical articles, coming from magazines or newsletters (agricultural, supply chain…) but there are also books, factsheets, reports, research results, studies, etc. Biobase is managed by ABioDoc, the French documentary centre specialized in organic farming, a department of the institution VetAgro Sup. Link to Biobase : https://abiodoc.docressources.fr/

Christian Dittrich, ATB
Extruded wood used for mulching, animal bedding and potting media – various raw materials have various characteristics
Q from Susanne Friis Pedersen, NORSØK: Which species do the forest biomass from Spain comprise? Any conifers?
A: Mostly pine and holly oak but could be anything from forest floor (this is material removed to prevent forest fires

Q/comment from Anna Bogush, CU and Anne-Kristin Løes, NORSØK: Did you do any physicochemical analysis of the investigated materials? E.g. could it be relevant to study effect of self-heating on fibre

characteristics? NB self-heating is dangerous both with respect to fire and production of fungal spores – not healthy!

Glòria Colom and Rafi Cáceres, IRTA
Alternative products to peat for transplants
Q from Margi Lennartsson, RHS: Was there a peat substrate used as a control, and was the peat control certified for organic use?
A: It was a commercial product, for conventional horticulture use.

Qs from Sabine Zikeli, UHoH: 1) Did you have any problems with pests, e.g. fungus gnats (Bradysia spp., a type of "mosquito")? 2) Did you have a look at the root development of the seedlings?
As: 1) There were no problems with pests. 2) We assessed the firmness/cohesion of the root-substrate of the seedling.

Przemyslaw Postawa, CUT
Completely degradable plastic mulch foils and other agricultural accessories
Qs from Anna Bogush, CU: 1) Which biochar (raw material) did you test in use? 2) How did you test the biodegradability of the films? 3) Did you analyse compost for presence of any residues of the films? (or maybe: composting as a method to get rid of film residues)

A to 1) Wood from mixed sources.
A to 2) and 3): Full tests of biodegradability and compostability are in progress and we estimate to finish it until May 2021. The compost and residues of the films will be analyzed in that research. We carry out research in multiple ways. We test the effect of UV irradiation on the film's surface degradation (accelerated UV Test chamber).

Qs from Anne-Kristin Løes, NORSØK: 1) If the new foil tested in 2020 is stronger, can it be used for 2 seasons? 2) Would it be possible to make something like Mypex degradable, e.g. "instruct" it to degrade after 10 years?
A to 2): Mypex is a woven textile made of PP polypropylene for groundcover. It is a completely different material as compared with a mono or multilayer film. In my opinion it is not possible to make a product with 10 years degradation time from biodegradable polymer, because usually the degradation process is not linear, and the many factors have an influence for stability and the dynamics of degradation. 10 years would be a very long time in terms of the stability of the properties of plastics, especially for thin films.

The Stradom factory in Czestochowa offers the PP textile (like Mypex) with different degradation time (for agriculture up to 5-6 years). These materials have a higher level of UV stabilizers additives, but it is UV and oxy degradation, not biodegradation.

We need to separate mulch film degradation in two stages. In the first stage, the film must form a weed-tight coating with degradation factors: UV-A, UV-B irradiation, oxygen, humidity, heat. In the second stage, the mulch film is mixed with soil and the degradation factors are no/less UV, less oxygen, microorganisms, anaerobic processes etc. In our investigations we would like to test those two stages.

Francis Rayns, CU
Mulches for weed control in field vegetables in UK

Comment from Tony Little (Innovative Farmers): When getting growers/farmers together a lot said they were not interested in biodegradable due to high carbon footprint, GM issues and because Francis added that there are many different brands of geotextile (of which 'Mypex' is a long-lived one). Some of these break down after a few years whilst others can be re-used for many years – as many as 20.

Q from Susanne Friis Pedersen, NORSØK: How thick was the layer with low and high rate of the various on-farm mulches?
A: The mulches were applied, by volume, at either 15 or 30 litres per m^2. We were anxious to keep the rates within what could reasonably be practical on a field scale. In theory this is equivalent to 1.5 or 3 cm depth but the granular or fibrous nature of meant that this was somewhat variable.
Qs from Adrian Evans, CU: 1) Why is hay so much more effective than other lose mulches in suppressing weeds? 2) Regarding plastic mulches versus alternatives, there seems to be some support for long lasting woven plastic coverings and even the LCA data show that these are not so bad. Do we need more data to really make a fair comparison between these products?
A1): This is probably because the hay 'sprang up' after it was laid and so covered the ground more effectively than the chips which could roll off one another to leave thin patches where weed could push through.
A2): This is very important. We need to make sure that all the implications of using each form or plastic are considered and to what extent this can be changed. For example, although a biodegradable plastic is currently made from conventional corn starch with inputs of agrochemicals this *could* be replaced with organically grown feedstock.

Alev Kir, MFAL
Composting pruning materials and testing of mulches and potting media under warm and dry conditions in Turkey

Q from Margi Lennartsson, RHS: Compost made with waste materials was compared (as potting substrate) with a substrate made 50% from fibre made from extruded olive prunings - what was the other 50%?
A: The other half was from chopped olive prunings.

Casper Laursen, L&F
Digestates and other recycled fertilisers for spring barley

Q from Anna Bogush, CU: "Did you analyse microplastic below 2 mm?
A: No, unfortunately we did not. We need your help and expertise on that matter, Anna, as we have already talked about.

Q from Sabine Zikeli UHoH: Do you know about the differences in plastic content of the digestate

depending on the source? For compost made from household waste the difference are very big, but I do not have data for biogas digestates.
A: We do know that there are much more plastics from household waste collected in areas of multifamily houses, apartments etc. than in one-family homes and in the countryside. More plastics are also present if the pre-treatment plants add waste from supermarkets etc., which is also very common in Denmark.

Additional Qs from Sabine, since also at Uoh there is a field study using two digestates, one from an organic farm based on pig slurry and clover grass, and one from "pure" household waste: How is the Danish digestate sold, is it directly via the biogas plant? 2) Is it accepted without problems by the Danish control bodies? I'm asking because we have sometimes problems with the control body. 3) How do you assess the plastic, only the macro plastic (e.g. on a per-volume basis) or also the microplastic? The German organic farmers have doubts about the plastic in the household waste digestates but there is no standardized method for the determination for the macro plastic yet and there is no method for assessing the microplastic at all. Maybe the situation is better in Denmark?

A1) The digestate in Denmark is always sold directly from the biogas plants. When the farmer receives digestate he/she has to register the area on which is applied and also the amount of digestate applied. You do that online so the control body knows in advance. Also, you'll get documentation from the biogas plant that states nutrient content, heavy metals, plastics etc. There are certain thresholds that need to be held in order to be approved for agricultural use (only stricter thresholds for heavy metals in organic farming versus conventional farming). The documentation also states if the digestate can be used by organic farmers (it has to contain only biomass listed in "Annex 1"). When the registration of area and the documentation is present the control body is satisfied.

2) Plastics are assessed through a legislation which is adopted from Sweden, implemented in 2019 (?) and the strictest legislation in Europe (as far as I know). However, it only assesses macro plastic (per volume AND per area) and does not take microplastic (< 2mm) into consideration. It is a major topic among Danish farmers as well (both organic and conventional), as we do not want to apply even more plastics than already present or applied from car tires etc. So, the fact that we do have legislation which assesses plastics from biogas plants is good, but the thresholds are not very strict. Example: We did some analyses last year of one digestate used in Danish O+ field studies, made from source-separated household waste. When applying that product up to 80 kg NH_4-N per hectare, the (macro)plastic in the digestate was allowed by the legislation to cover as much as 8.6 m^2 per hectare. That is if all the plastic in the digestate were collected and placed next to each other on top of the soil. 8.6 out of 10.000 square meters might not sound of much but the farmers involved in and informed of the study were not at all impressed. In practice, though, the digestate from the trial only contained plastic enough to cover 2.4 m^2 - well below the threshold. We do not hear much from the control body about problems related to plastic residues. The biogas plants, including "pretreatment facilities" which treat/pulp household waste, are addressing the plastic issues. It is a topic of major political and public interest, so they are "preparing for the future", as they say. They are by law obligated to test their batch (analysed by authorized company) at least 4 times a year.

Carolin Weiler, UHoH
Fertilisers from legumes and recycled waste products for cabbage, spinach and winter wheat
Anne-Kristin Løes, NORSØK commented that the price of N was really high. Carolin responded that the cost was probably high as they only bought a small quantity.

Anne-Kristin Løes, NORSØK

Marine-derived fertilisers for fodder crops

No questions