



Highlights of 2024

SLU Centre for Biological Control, CBC

A popular science report of CBC's activities
Editor: Cajsa Lithell



The SLU Centre for Biological Control (CBC for short) is run by SLU with a grant from the Swedish government. Five researchers associated with the Centre engage in research, education, policy development, and communication to stimulate the development and implementation of biological control, working in close collaboration with various stakeholders. A specialist communicator is also linked to the Centre.

‘Biological control’ is a collective term for strategies to combat troublesome pests and pathogens using beneficial live organisms: as such it is often an important component of Integrated Pest Management (IPM) strategies for plant production. Biological control has great potential to restrict the damage caused by harmful organisms, including pest insects and plant pathogens.

Highlights of 2024 - SLU Centre for Biological Control

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Does CBC pay off?

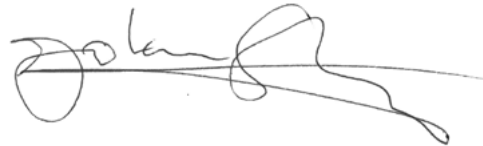
SLU Centre for Biological Control (CBC) received 5.3m SEK in state funding for 2024. Swedish taxpayers may rightly ask themselves, in the words of famous business leader Leif Östling, “What the h*ll do we get for the money?”. Here is a brief explanation of CBC’s accounts:

The lion’s share of CBC’s funding goes towards five half-time (50%) research posts which enable us to conduct research on biological control. This investment is profitable for SLU as the assigned researchers attract significant external funding from multiple sources, enabling CBC to run an average of 30 scientific projects per year. These projects, in turn, tend to result in around 30 peer-reviewed publications as well as numerous expert reports, popular publications, and patents. In addition, our researchers teach a number of undergraduate and postgraduate courses and supervise around 10 MSc and BSc students. The high quality of this work has been recognised through numerous prizes, awards, and media appearances which you can read more about as you flip through this booklet.

CBC’s scientific output does not end up gathering dust in a library but is continuously communicated to relevant players in society including authorities, industry, farmers, policy makers, journalists, and the general public. Dialogue with these stakeholders is facilitated by CBC’s communicator (who has a 20% assignment with us) and our fantastic reference group which includes representatives of each of the aforementioned interests.

Thus, the 5.3m SEK annually invested into the part-time roles at CBC has yielded surprisingly high returns in a way that I believe is rarely seen elsewhere in the public sector. Overall, we have contributed small but very important pieces to the green transformation that will make our agriculture, horticulture, and forestry more sustainable, competitive, and future-proof.

New adventures await CBC in 2025. Two of our more senior researchers, namely Paul Becher and myself, will leave CBC to make room for two junior researchers who will step in with new and vital energy. The new team will be presented shortly and will reveal their operational plan soon thereafter. Keep an eye on CBC’s web page to catch up with the exciting new activities on the horizon. I am very grateful for all the years that I have enjoyed as director of CBC and hereby wish Maria Viketoft, who will henceforth take over this pleasant duty, all the best.



Johan A. Stenberg, Director of the SLU Centre for Biological Control



Groundbreaking contribution to a greener industry

On October 23rd, prizes were awarded to projects that stood out for being particularly innovative, groundbreaking, or contributing to greener industry. Through a collaboration between Sparbanken Skåne and SLU, a total of 400,000 SEK was given to five projects addressing sustainability challenges in the agricultural sector.

Ramesh Vetukuri won SLU Alnarp och Sparbanken Skåne's Innovation prize for 2024 with his innovation VirEnzym. VirEnzym increases enzyme efficiency, thereby reducing the dosage required to achieve a given effect. This boost in enzyme performance leads to significant cost savings and greater efficiency, scalability, and sustainability in enzyme production and application. After many years of research, VirEnzym's platform has achieved a level of stability and robustness that no one has previously managed, making this technology a breakthrough in the field.

– The applications of this discovery are numerous. In the food industry, it can improve production processes and enhance the quality of food products. In the pharmaceutical industry, it enables the development of new drug systems and improves the efficiency of existing medications. The technology can also be used in the environmental sector for bioremediation and pollution control, says Ramesh.

Ramesh also received the Growth Award – Researcher and Staff Category, jointly with Naga Charan Konakalla, for the project “Reducing Pesticide Use with Biodegradable Protein Cages”.

Read more (in Swedish) here: [Sveriges största innovationspris inom den gröna näringen har delats ut.](#)



From the left: Helen Göransson, bank manager, Sparbanken Skåne, Christina Lunner Kolstrup, Dean SLU Alnarp, Birhanu Wörabo Halabo, Naga Charan Konakalla and Ramesh Vetukuri. PHOTO: ANETTE NELDESTAM LARSSON.

Awards for pest control

Bharathi wins award for research on a mute button for potato blight

Bharathi Boddu, a master's student at SLU Alnarp, won the Global Sustainability Award on SLU Thesis Day 2024 for her work on strategies to combat potato late blight with virus-like particles. Bharathi's presentation was titled Spud Squad - Sustainable Solution to Potato Blight and was based on her thesis "Using dsRNA-loaded virus-like particles as an effective SIGS strategy to combat potato late blight". Bharathi Boddu is supervised by Naga Charan and Ramesh Vetukuri.

The long-term aim of this research project is to secure vital food production around the globe and thereby help achieve SDG 2 – Zero Hunger. The project will also benefit SDG 15, Life on Land, by helping surrounding ecosystems as current fungicides become obsolete, according to Ramesh Vetukuri.

Read more here: [Bharathi wins award for research on a mute button for potato blight](#)



Bharathi Boddu. PHOTO: RAMESH VETUKURI.



Naga Charan Konakalla receives the prize from the hands of King Carl XVI Gustaf. PHOTO: JONAS BORG.

Naga Charan Konakalla receives royal award for research targeted pesticide delivery

Naga Charan Konakalla has been awarded a prize from King Carl XVI Gustaf's 50-year fund for science, technology, and the environment, for his work on virus-like proteins as nano carriers for targeted pesticide delivery. The prize includes a scholarship of 100,000 SEK and was presented to Naga by King Carl XVI Gustaf himself on June 10th, at a ceremony in the Royal Castle in Stockholm.

Ramesh Vetukuri, leader of the research group that Naga Charan is part of, explains that an important aspect of this work is using bio-nanoparticles engineered from harmless plant virus proteins to precisely target and deliver fungicides and biological substances against plant pathogens.

Read more here: [Naga Charan Konakalla receives royal award for research targeted pesticide delivery](#)

Plant protection through biological control

— Examples of research at CBC during 2024

Are pests adapting to the push-pull system?

The idea of ecological intensification is to utilise biodiversity to maintain agricultural yields while reducing negative environmental impacts. Anthropogenic inputs such as pesticides and synthetic fertilisers can be replaced by using carefully managed biodiversity to maintain or improve ecosystem services, including productivity. One example is push-pull systems that reduces pest pressure by providing repellent stimuli (push), combined with attractive stimuli (pull) while also counteracting parasitic weeds. But how do these systems develop over longer time scales? Mattias Jonsson and colleagues have investigated this.

While pest management is often a goal in ecological intensification, Mattias explains that few studies have examined ecologically intensified pest management systems over longer time scales.

Drawing on data from 476 farmers over 24 cropping seasons, the researchers showed that pest numbers declined, and yield improved over time in both push-pull and nearby control fields. The study concludes that ecologically intensified agriculture is resilient against pest adaptation, maintaining consistently high yields over time.

Read more here: [Are pests adapting to the push-pull system?](#)

A new bacterial consortium can combat wheat disease

Fusarium head blight is an economically important fungal disease in winter wheat. It is caused by several *Fusarium* species and can lead



PhD student Grace Mercy Amboka investigating a push-pull system in Kenya. PHOTO: PRIVATE

to major yield reductions worldwide. Most serious, however, is that several *Fusarium* species can form mycotoxins that are dangerous to both humans and animals. Now, researchers from SLU have identified a promising bacterial consortium capable of effectively managing Fusarium head blight.

Vishnukiran Thuraga explains that this bacterial consortium can inhibit *Fusarium* growth, significantly reduce disease progression, and decrease levels of the dangerous mycotoxin deoxynivalenol.

—The bacterial strains in the consortium are naturally occurring enemies of *Fusarium* and therefore work as biological controls. Bacteria from the *Bacillus* and *Pseudomonas* genera, known

for their biocontrol capabilities, are included in the mix.

Read more here: [A new bacterial consortium can combat economically important wheat disease](#)

Intensive agriculture results in less reliable weed control from seed eaters

While, with the help of pesticides and fertilisers, agriculture has intensified around the world, crop species diversity has declined and landscapes become simpler. These disturbances lead to biodiversity loss and less pollination and biological pest control in the fields. It is thought that highly biodiverse systems can compensate for a lost species by relying on another similar species to deliver the same ecosystem function. This is called functional redundancy.



Agricultural intensity in the form of increased field management intensity and reduced crop rotation diversity reduced the functional redundancy of weed seed predation. PHOTO: EIRINI LAMPRINI DAOUTI

– We investigated the abundance of carabid beetles and combined it with molecular gut content data to estimate the functional redundancy of seed predation. ‘Analysing carabid beetles’ diet is a powerful way of finding out about their role in agroecosystems’, says Eirini Daouti, one of the researchers behind this study.

We found that more intense field management, measured as the number of visits a farmer makes to carry out an intervention such as applying herbicide or tilling, and lower crop diversity reduced the level of functional redundancy among predators on weed seeds. However, we did not find that landscape simplification had a distinct effect, says Mattias Jonsson.

Read more here: [Intensive agriculture results in less reliable weed control from seed eaters](#)

Small RNAs – the future of plant protection?

Small RNAs are common in fungi, including those that can be used as biocontrol agents in agriculture, horticulture, and forestry. In a new review article, researchers from SLU summarise recent findings on the role of RNA silencing in parasitic fungus–fungus and fungus–insect interactions in relation to their use for the biological control of fungal plant diseases and insect damage.

Ramesh Vetukuri explains that disrupting the RNA silencing machinery in biocontrol fungi has a significant impact on their effectiveness. Many small RNAs are produced constantly but regulated differently when they interact with hosts.

Cross species RNA silencing is a remarkably interesting research area that may be significant for our food security. However, Edoardo Piombo notes that we still need to tackle challenges such as difficulties separating bioinformatic data about mycoparasites from that relating to their hosts.

Read more here: [Small RNAs – the future of plant protection?](#)



Millions of tons of discarded mushroom compost can be used for sustainable cultivation

Edible mushrooms such as white mushrooms (*Agaricus bisporus*) and oyster mushrooms (*Pleurotus ostreatus*) are grown in a compost material that is thrown away once they have been harvested. In Europe, more than three million tons of compost are produced from white mushroom farms alone. SLU researchers have published a new study in which they found that this by-product is very nutritious and can be a green alternative to chemical pesticides and synthetic fertilisers.

– By using spent mushroom compost instead of peat, Samar Khalil suggests that the horticulture sector's carbon footprint can be reduced as the compost lowers the need for both synthetic fertilisers and pesticides.

– To secure the food supply for a growing population in a changing world, we need to develop resilient cultivation systems. Using discarded mushroom compost has many benefits for horticulture: reduced environmental impact, healthier plants, and less pesticide use, says Ramesh Vetukuri.

Read more here (in Swedish): [Miljontals ton kasserad svampkompost kan användas till hållbar odling](#)

Fly away or stay to control pests?

If you release hoverflies into cultivation tunnels to combat aphids, do they stay and protect the crops or fly away? Paul Becher and his research team investigated this in tunnels used for commercial raspberry and blackberry production.

Using water resistant colour pencils Guillermo Rehermann and Sheelan Barazanji marked almost 300 hoverflies of the species *Eupeodes corollae* prior to their release into the tunnels.

– The marked and released hoverflies could be recorded for several days in company with wild hoverflies on plants with aphid infestation. As a next step we would like to quantify the impact of



Giovana Prado, who was a master student in the project, and Ramesh Vetukuri investigate strawberry plants grown in mushroom compost. PHOTO: LAURA VETUKURI.

released hoverflies on the aphids in more detail, says Paul.

Read more here: [Fly away or stay and control pests?](#)

Wheat can control a fungus to improve its protection

For the first time, SLU researchers have shown that a crop, in this case wheat, can control what a beneficial fungus does by sending small RNA molecules into the fungal cells. This is a big step forward for research into environmentally friendly control methods in agriculture. The research builds on the groundbreaking work that was awarded the Nobel Prize in Physiology or Medicine in 2024.

Some fungi live as parasites on other fungi, and some of such species have started to be used to control harmful fungi that cause crop diseases. Researchers at SLU are trying to gain a deeper understanding of the mechanisms involved in

order to improve the effectiveness and efficiency of this type of biological control.

In this work, we have now discovered a completely new mechanism for how plants and fungi communicate. The discovery was made in studies of wheat and *Clonostachys rosea* – a parasitic fungus that can attack wheat pests and therefore can be used as a biological pesticide. This beneficial fungus also has properties that promote the growth of wheat.

The communication takes place with the help of small RNA molecules, sRNA, which move from the wheat roots into the fungal cells where they then regulate important genes in the fungus. The wheat can thus switch off, or silence, a gene that affects a certain characteristic of the fungus. This is the very first study in which sRNA molecules have been shown to be transported from a plant to a biological control organism.

– It is exciting to see how plants and beneficial fungi can communicate in this way. This discovery brings us one step closer to a future in which we can develop crops that have stronger defence systems of their own. It would be a perfect way of making biological control organisms more effective and agriculture less dependent on chemical pesticides, says Ramesh Vetukuri.

Read more here: [Wheat can control a fungus to get better plant protection](#)

Rooftop greenhouses – A way forward for urban food production in Sweden?

Rooftop greenhouses can provide fresh and locally produced food while optimising land use and energy efficiency. There are currently no large-scale rooftop greenhouse operations in Sweden, but would they be feasible? This question was investigated through an interdisciplinary collaboration at SLU.

The project was called “Food production and food security through agritecture: Interdisciplinary group on rooftop greenhouse technology” and started in 2023 as a part of the Interdisciplinary Academy (IDA) at SLU.

– Working in an interdisciplinary way has worked very well and been a really enjoyable experience full of learning and exchange. I especially enjoyed the study trips to rooftop greenhouses in Germany and Belgium. Biological control plays a crucial role in managing pests and pathogens in rooftop greenhouses, says Paul Becher.

The researchers are currently producing a book on rooftop greenhouses, and have formed a network. They have contact with many organisations, and one PhD project on rooftop greenhouses has begun.

Read more here: [Rooftop greenhouses – A way forward for urban food production in Sweden?](#)

New bacterial strains show promise for biocontrol of tomato diseases

Ten bacterial strains from the tomato core microbiome that show potential for promoting plant growth and controlling diseases has been identified.

– The selected bacterial strains in our study were not only effective in promoting tomato plant growth but also significantly reduced the severity of Fusarium crown and root rot, as well as bacterial spot infections in tomato plants. We think that by focusing on microbial communities that occur naturally in plants, we can enhance





Nataliia Khomutkovska collects wild strawberry plants around Campus Alnarp. PHOTO: CAJSA LITHELL.

agricultural productivity while reducing the environmental footprint of farming, says Ramesh Vetukuri.

Read more here: [New bacterial strains show promise for biocontrol of tomato diseases](#)

Wild strawberry plants from across Europe may contain the keys to sustainable soft fruit production

Wild strawberry plants have a constant companion in the form of a black yeast-like fungus, *Aureobasidium pullulans*. This fungus functions as a bodyguard, protecting the strawberry plants against various plant diseases. Could this yeast fungus also help to protect commercial strawberry crops? Researchers from SLU wanted to find this out, so they asked colleagues and the public to help by sending wild strawberry plants from all over Europe. Nataliia Khomutovska is a postdoc in the research project.

– The characteristics of different strains of *Aureobasidium pullulans* typically differ. We wanted to investigate how the characteristics of this fungus vary in wild strawberry plants across Europe. At the same time, we wanted to look at variation in the strawberry plants' resistance to

various diseases. How do the characteristics of the fungus and the wild strawberry plants' resistance vary across the continent, and are there signs of coevolved covariation between the two?

How do you then motivate scientists from all over Europe to help with a complicated sampling process and then send strawberry plants to Swedish researchers?

– We made a film in which I asked for help and explained how to sample the wild plants according to a fixed protocol. We posted the film on various social media. To participate, you had to be affiliated with a university or research institute, explains Nataliia.

– It was great to involve so many people in this, and the samples will help us understand how plant/microbe associations develop at a continental scale, and provide insight into how we can optimise plant protection for cultivated strawberries, says Johan Stenberg.

Read more here: [Wild strawberry plants from Europe may contain keys to healthy cultivated strawberries](#)

More research from CBC can be viewed here: www.slu.se/cbc-publications



The gout fly - a new pest of spring wheat

The gout fly (*Chlorops pumilionis*) is a new insect pest in Sweden. The first serious attacks by gout flies in fields of spring wheat were observed in Skåne, Blekinge, and Halland in southern Sweden in 2019. Since then, the gout fly has become an established pest and has also occurred in some places in central Sweden. Hanna Kollberg researched the gout fly in Sweden for her bachelor's thesis.

–The purpose of my essay was to summarise the biology of the gout fly, its damaging effects, and possible control measures in Sweden through a literature review, as well as to identify gaps in knowledge and areas for continued research, says Hanna.

Hanna located and compiled relevant information about this pest. Since the gout fly is a relatively new problem pest there was no previous compilation of the species. Hanna also identified some knowledge gaps and needs for future research.

– It is important to have preventative control measures as these are the basis of integrated pest



Hanna Kollberg. PHOTO: PRIVATE.

management, IPM. It was interesting to see where the gaps in knowledge are and where more work is needed to reduce the damage caused by the gout fly, says Hanna.

Read more here: [The gout fly - a new pest of spring wheat](#)



A gout fly. PHOTO: NIKK, FLICKR. [CC BY 2.0](#)

Scientific advice

CBC consistently communicates with Swedish and international authorities, industry bodies, farmer organisations, and individuals about biological control issues.

In May, Mattias Jonsson contributed to a field day for farmer advisors about natural enemies of crop pests. The field day was held at Säby, close to Uppsala and was organised by the Swedish Board of Agriculture. In November, Mattias Jonsson gave a talk about changes in insect fauna (including natural enemies) at Växtskyddsrådet, KemI, Sunbyberg.

In June, Paul Becher contributed to a field demonstration about biological diversity in the

agricultural landscape at the “Borgeby Fältdagar”, organised by The Swedish Board of Agriculture.

Finally, Johan Stenberg participated in several meetings with the European Food Safety Authority and the Norwegian Scientific Committee for Food and Environment to provide scientific advice on regulatory issues related to biological control.



Mattias Jonsson at a field day about natural enemies to crop pests for farmer advisors. PHOTO: PETTER HALDÉN.



Agrobiodiversity, woodland strawberries and RNA

— Examples of CBC in the media

Exploring the future of agrobiodiversity

Increasing the biodiversity of our food systems is important for several reasons. It can help us achieve a more varied and nutritious diet, because the range of locally sourced food will increase and because we can use less of the pesticides and fungicides that can harm both human health and the environment.

– Increased biodiversity can also improve the resilience of our food systems to climate variability and to global environmental change, says Mattias Jonsson.



Every year is a good woodland strawberry year, but the plants do not always bear fruit. PHOTO: CAJSA LITHELL.

Mattias and Ariani Wartenberg aim to explore how greater agrobiodiversity can improve the resilience of pest control services. Mattias is the project coordinator of the IMPRESS project which stands for “Improving agrobiodiversity for resilient pest control services across landscapes”.

Hear them talk about it in the podcast Scientific voices: [Exploring the future of agrobiodiversity](#)

Why are wild strawberries so much better than regular strawberries?

Johan Stenberg appeared on the radio show *Talkshow i P1* to discuss the differences between cultivated garden strawberries and their wild relative, the woodland strawberry. So, is this a good year for woodland strawberries?

– Woodland strawberry is one of Europe’s most common plants, so it is always a good year for them, but they do not always bear fruit, which is why people might not notice them, Johan answered.

Why are wild woodland strawberries better at protecting themselves from pests than regular strawberries?

– Unlike cultivated strawberries, wild strawberries must fend for themselves and have evolved incredible ways of protecting themselves against insects, diseases, heat, and cold. Attempts have been made to breed woodland strawberries to produce larger fruit, but consumers seem to prefer the intense aroma of woodland strawberries in smaller amounts.

[Listen to Johan \(in Swedish\) at Talkshow i P1.](#)



Small RNA Molecules - Essential Biological Tools

Small RNA molecules, or sRNA, are commonly found in fungi, including those that can be used as biological pesticides in agriculture, horticulture, and forestry.

Jordbruksaktuellt highlighted research on the role of RNA silencing in various interactions between fungi and between fungi and insects. These findings can be applied to the biological control of fungal plant diseases and insect damage.

– If you disrupt the machinery where RNA is silenced in biological control organisms, it has a major impact on their effectiveness in crop protection. Many sRNAs are constantly produced, but their production is regulated differently when the organism interacts with its host, says Ramesh Vetukuri.

Read the article in Jordbruksaktuellt: [Små RNA-molekyler – viktiga biologiska verktyg](#)

Mushroom compost can replace peat

The gardening sector can reduce its carbon footprint by using peat-based soil mixed with

mushroom compost. This compost decreases the need for both synthetic fertilisers and pesticides.

– Mushroom cultivation creates a large amount of waste that is currently not used for anything, but it is nutrient-rich and has a diverse microflora that can benefit soil health. In a new study, we have examined various properties of compost material used to grow mushrooms such as button and oyster mushrooms. Using discarded mushroom compost offers many advantages for gardening: reduced environmental impact, healthier plants, and less need for pesticides', says Ramesh Vetukuri.

Read more in Aftonbladet: [Studie: Svampkompost kan ersätta torv](#)

Wheat controls beneficial fungi with microRNA

A completely new mechanism for how plants and fungi communicate has been uncovered. The discovery was made in studies of wheat and the fungus *Clonostachys rosea* – a parasitic fungus that can attack wheat pests and therefore can be used as a biological pesticide.

[See Ramesh Vetukuri talk about this in a film at Lantbruksnytt.](#)



Biocontrol in the Encyclopedia of Ecology

Researchers from CBC are contributing two chapters to the upcoming edition of the *Encyclopedia of Ecology*, a comprehensive reference work on ecological concepts and ideas.

– Our first chapter focuses on *Classical and Augmentative Biological Control*, while the second is about *Conservation Biological Control*. Together, these chapters cover the entire concept of biological control. While *Conservation Biological Control* involves promoting natural enemies already present in a target area, *Classical and Augmentative Biological Control* is about releasing beneficial organisms multiplied through industrial processes to provide pest control in the target area’, says Johan Stenberg.

– In the chapters, we explain the concepts behind these types of biological control, provide historical examples, and discuss how they could be used even more effectively in future. We also address the risks and regulations associated with these methods.

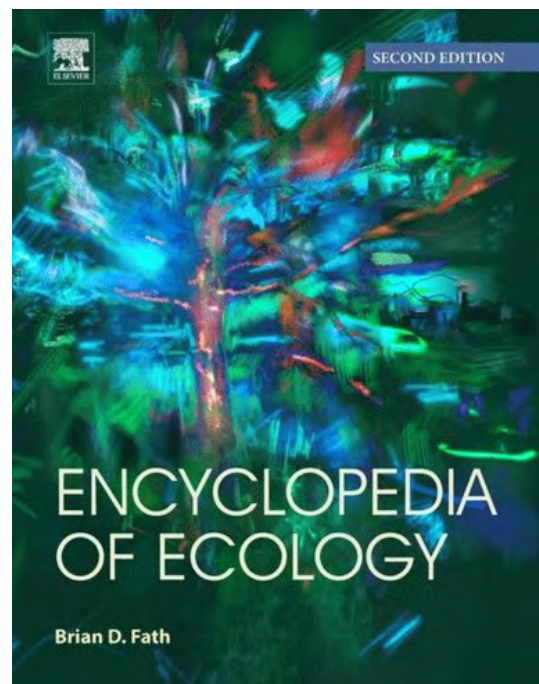
In preparation for this work, the CBC researchers studied the previous edition of the *Encyclopedia of Ecology* to evaluate its strengths and weaknesses with respect to biological control. They then collaboratively sketched out new versions of the relevant chapters.

– Based on these outlines, they then worked individually on different sections of the text, which were discussed and refined within the group before the final versions were completed. Both chapters have been entirely rewritten, as much has changed in biological control, including advancements in science, applications, and legislation.

When the earlier edition of the *Encyclopedia of Ecology* was published, biological control was still

a niche practice in commercial crop production. Thanks to successful research, new legislation, and significantly increased demand, biological control is now widely known among crop producers and is used by many as part of integrated pest management strategies.

– These chapters are designed to provide a broad overview of biological control and can be read by students as well as professionals in agriculture, industry, government agencies, media, and academia. Hopefully, they will offer a fundamental understanding of the subject even to people who would never consider reading scientific literature, Johan concludes.



The last version of Encyclopedia of Ecology came out in year 2008.

The researchers at CBC

This is CBC's operational group that has been active during 2024. These researchers are team leaders and work with post docs, PhD students, and Master's students.

Johan Stenberg (Director) – focuses on optimisation and evolution-proofing biocontrol within the framework of Integrated Pest Management, often involving wild genetic resources and studies of natural selection in agroecosystems.

Maria Viketoft (Deputy director) – works on nematode ecology, particularly these worms' interactions with plants (crops and wild species) and other soil organisms.

Paul Becher – studies chemically mediated interactions between organisms, including host-finding and sexual communication in insects. He is specifically interested in the function of semiochemicals in biological control.

Mattias Jonsson – specialises in insects and arachnids for biocontrol. He focuses on natural and conservation biological control of invertebrate pests in agroecosystems.

Ramesh Vetukuri – is interested in plant-microbe and microbiome interactions, focusing on developing new and sustainable ways of improving plant yield and controlling diseases. He focuses on microbes and their effectors, including small RNAs that modulate plant traits.

Cajsa Lithell – is CBC's Communications Manager.



Seminars and an Italian visit

CBC has a seminar series that this year included two seminars, one by Professor Magnus Karlsson and one by Dr Pedro Rosero from Lund University.

Comparative genomics of the biocontrol fungus *Clonostachys rosea*

Magnus Karlsson from the Department of Forest Mycology and Plant Pathology at SLU gave a seminar on biocontrol properties of the fungus *C. rosea*. This fungus was shown to provide control of Fusarium head blight and Septoria tritici blotch in field trials over consecutive years, resulting in a successful patent application. To further study the evolution and biocontrol mechanisms of this species, Magnus' research group are performing large-scale analyses of genetic variation between and within species.

Read more here: [Comparative genomics of the biocontrol fungus *Clonostachys rosea*](#)

Advances in biological control from an evolutionary perspective

Pedro Rosero from the Department of Biology at Lund University talked about conservation biological control in agricultural landscapes. He works on promoting populations of natural enemies to mitigate both short- and long-term pest damage to crops. Pedro talked about how natural enemies and their herbivore prey can adapt their niches in response to land-use changes. A theoretical eco-evolutionary framework can be used to understand long-term biological control. Such an approach should provide important insights into future efforts to promote sustainable and long-term biological control.



A visit from Italy to develop new biocontrol agents

Associate Professor Vittoria Catara from the University of Catania in Italy visited Campus Alnarp in April. The aim of the visit was to investigate interactions between microbes to develop new methods that could decrease reliance on synthetic pesticides, in collaboration with Ramesh Vetukuri's research group.

– My research is primarily focused on plant-associated bacteria. This includes studying plant pathogenic bacteria as well as beneficial bacteria that can serve as biocontrol agents. More recently, I have explored interactions within the microbiome, says Vittoria.

Read more here: [A visit from Italy to develop new biocontrol agents](#)



Teaching biocontrol

CBC researchers are involved in teaching on many courses at undergraduate, graduate, and postgraduate levels. To highlight some examples: undergraduate level biological control was taught as part of courses in ecology, crop production, and plant protection.

At undergraduate level, CBC was involved in teaching about natural enemies on a course entitled “Crop production – weeds, pests and diseases”. At graduate level, CBC was included in teaching about biodiversity and ecosystem services on the course “Horticultural systems and future challenges”. In December 2024, a new PhD course called “Emerging technologies and their contribution to sustainable plant protection” started, under the leadership of Ramesh Vetukuri and Mukesh Dubey.

A new summer course on “Practical plant protection in parks and green environments” was organised by Paul Becher to provide theoretical and practical knowledge for professionals who work with plant protection in parks and other green environments.

Fostering a new generation of plant breeders and biotechnologists

A new Erasmus project called BREEDTECH aims to improve education and research in plant breeding, biotechnology, and biocontrol. Partners from Europe, Africa, and the Middle East are involved in enhancing curricula, modernising research infrastructure, and building capacity for addressing global agricultural challenges.

At SLU, Ramesh Vetukuri leads a work package focusing on curriculum development with a special emphasis on plant breeding, biotechnology, and biocontrol. The project addresses the critical challenges of food security, climate change adaptation, and sustainable agricultural development.

– We want to foster a new generation of plant breeders and biotechnologists equipped to meet the demands of a changing global agricultural landscape. We hope that the BREEDTECH project will make a lasting impact on global agriculture, says Ramesh.



Students collect insects from traps in a barley field. PHOTO: CAJSA LITHELL.

Inspiring science for children

Can worms cough?

Maria Viketoft talked to four- and five-year-olds at the Arken preschool in Lund municipality about earthworms. The initiative came from a teacher who contacted the SLU Service Centre and asked for an earthworm expert.

Do worms have a mouth? Is worm poop soil? Can worms have babies in their bellies? Are worms dangerous? How can worms talk? Do pigs eat worms? Can worms cough? Do larger animals eat worms? These were some of the questions the preschool children wanted the answers to.

– It was fun to hear what the children were curious about, and they really think in a different way to adults! It is fascinating and enjoyable to communicate with young children, and the way they think outside the box is truly inspiring. I believe it is important to communicate with children so that they develop an interest in nature. It is crucial that they learn facts about nature, as they are the generation that will be responsible for managing our natural resources in the future, says Maria.

Read more here in Swedish: [Kan maskar hosta?](#)

Creepy earthworms and a budding interest in nature at Scifest

Uppsala University and the SLU invited schools and members of the public to participate in three exciting days at the science festival SciFest. Activities included programming LEGO robots, brushing a dog's teeth, testing your nerves in a creepy VR world, and meeting live bees. The festival offered a vibrant mix of young visitors, student volunteers, and exhibitors from Uppsala University, SLU, and SciFest's sponsors and partners. Fyrishov buzzed with energy. Maria Viketoft was on site to welcome visitors and discuss research.

– It is great to meet children and the public to spark curiosity and interest in our amazing organisms, which are important to us even if we do not always realise it. To appreciate nature, we need to know what is out there and how it works. I noticed a wide range in children's knowledge levels, and I realised that it is essential to reach those who have not yet developed an interest in nature at home or in school, said Maria.

Maria displayed earthworms, which are important for soil quality, in an activity about how potato chips are made. And of course, healthy soil is essential for potatoes to grow well.

– When I asked the children if they knew what earthworms are good for, I often got the answer 'for fishing.' Earthworms inspire a mix of fascination and fear—some of the little ones were eager to touch the worms but also found them a bit scary, Maria explained.

Read more in Swedish here: [Läskiga daggmaskar och spirande naturintresse på SciFest](#)



Maria Viketoft shows earthworms to children at SciFest. PHOTO: ANNA LUNDMARK

Team and reference group meetings

This year the reference group meeting and the CBC team meeting were held in Malmö, on 7th and 8th November.

Connecting academia and society

The purpose of the SLU Centre for Biological Control includes disseminating the University's collective knowledge for the benefit of society and providing a bridge between academia and various external actors, and between researchers. CBC's reference group provides one such bridge for interacting with other actors in society. Its aim is to develop knowledge and understanding of biocontrol through collaboration between SLU and these actors. On 7th November, the annual meeting with the reference group was held at the Comfort Hotel in Malmö and representatives from the Swedish Board of Agriculture, the Swedish Environmental Protection Agency, the Swedish Chemicals Agency, and RISE (Research Institutes of Sweden) were present. The CBC researchers and the reference group updated each

other on ongoing research and anything that is happening in their organisations which has implications for biological control practices.

Research at the highest level

On 8th November, CBC held its annual team meeting, bringing together researchers from the Ultuna and Alnarp campuses. During the day, the doctoral students and postdocs gave presentations on their ongoing research.

– I am amazed and impressed; the quality of the presentations is so high and the research that is being done at SLU by you is really of the highest level. I hope that you remain at SLU for a long time and continue with your great work, said Johan Stenberg to the early-career presenters at the end of the day.



The CBC group and their associated members at the team meeting in Malmö in November 2024. PHOTO: CAJSA LITHELL



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