Weed Biological Control
Progress Report 2026

CABI Switzerland
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KNOWLEDGE FOR LIFE


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Philip Weyl

Notes from the section leader

I am pleased to share our mid-season progress report, which highlights some of the key achievements and challenges during the first half of the year. I hope you enjoy reading about the progress made in the project sections below.

In spring we received exciting news that Agriculture and Agri-Food Canada (AAFC), in collaboration with the British Columbia Ministry of Forests, released more than 1,200 stem-mining weevils, *Microplontus millefolii*, against common tansy at sites in Alberta and British Columbia, Canada. We hope they will thrive in their new environment. At the other end of the spectrum, we completed the final shipment of *Lenisa geminipuncta* pupae for the biological control of phragmites in Canada, ending a project that began in 1998. Over nearly three decades, it has made a significant contribution to capacity building in weed biological control. At CABI alone, the project supported Patrick Häfliger's PhD in 2007 and provided training opportunities for 70 summer students, many of whom remain valued colleagues and collaborators today.

As projects come to an end, there are encouraging signs, with promising new projects emerging on water soldier, *Stratiotes aloides*, and *Rubus* species. However, in Europe it has become increasingly clear that greater investment in outreach and education is needed to build interest in innovative management approaches, like biological control. In the Canton of Jura, Lauréline Humair has taken a keen interest in raising awareness and promoting sustainable options for invasive weed management. I encourage you to read the summary of the *Les plantes en mouvement* ("Plants on the move") project.

Capacity building remains central to our work and continues to be a rewarding aspect. I am particularly proud of MSc student Elena Ianeva, who submitted her thesis on parrot's feather in July. Her thesis provides valuable insights into how plants chemically defend themselves against herbivory and the implications of these responses for weed biological control research. In addition, we have welcomed five summer students to our lab this year, representing Ireland, Portugal, France, and Switzerland. We also continue to host local school and university students for short-term internships, providing opportunities to learn about invasive species and biological control. Beyond our activities at home, several team members were fortunate to attend the International Symposium on Biological Control of Weeds (ISBCW) in New Zealand in March. The meeting provided an opportunity to share our research, learn from colleagues, and strengthen both existing and new collaborations.

2026 has also presented significant challenges. Uncertainty surrounding funding, combined with political instability, as well as, the extreme heatwave and drought brought certain field activities to a standstill. This particularly affected several rearings of the agents we work with as well as limiting surveys aimed at identifying new biological control agents for Russian knapweed. Despite these challenges, we remain optimistic and look forward to cooler temperatures, much-needed rainfall, and the opportunity to revisit our study systems next spring.

Finally, I would like to extend my sincere gratitude to our international and local collaborators, partners, and funders. Their continued support makes our work possible. I would also like to recognize the dedication, enthusiasm, and hard work of the Weeds Team, including both staff and students, for making 2026 a productive, successful, and enjoyable year so far. And finally thank you for your continued interest in our work, and please do not hesitate to contact us if you have questions about the projects.

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1 Blueweed (*Echium vulgare*)

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1.1 Test plant list

A draft test plant list was prepared by Rachel Winston (MIA Consulting) and is currently being revised by CABI and our North American collaborators. The current list includes approximately 60 species from the family Boraginaceae from which approximately 40 are native to North America. Based on the draft test plant list, we started to source and grow non-target species to be included in host-specificity testing of the potential agents.

Larvae of the root-feeding weevil *Mogulones geographicus* on blueweed.

1.2 *Mogulones geographicus* (Col., Curculionidae)

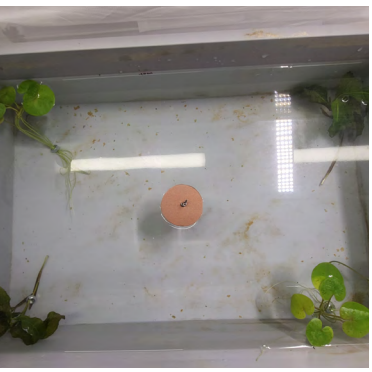
Between late 2025 and early 2026, a total of 20 non-target species were exposed to the root-feeding weevil *Mogulones geographicus* under no-choice conditions. These plants were dissected between February and April 2026. Approximately half of the species (including two species native to North America) supported larval development to the third instar. These results were surprising since *M. geographicus* is only reported from *Echium* species in its native and introduced range. Because it contributes to the successful control of *E. plantagineum* in Australia, we plan to conduct an open-field test in autumn 2026 to further investigate its host-range under more natural conditions.

Flea beetle larva found in a root of blueweed in southern Germany.

1.3 *Longitarsus echii* (Col., Chrysomelidae)

In June, we conducted a field survey in southern Germany to identify collection sites of the root-feeding flea beetle *Longitarsus echii*, another successful biological control agent of Paterson's curse in Australia. As it was already too late to collect adults, we collected roots of blueweed and dissected them for larvae. We found flea beetle larvae at two sites and will get them identified by molecular analyses. If the correct species is identified we plan to collect adults and initiate a rearing of this species for further testing.

Summer student Duarte Costa collecting blueweed in southern Germany.



Setup for the *H. albifrons* dual-choice test with control plant, *H. morsus-ranae* and test plant, *P. lucens* in opposite corners.

Bagous puncticollis third instar larva in turion of *Hydrocharis morsus-ranae.*

2 European frogbit (*Hydrocharis morsus-ranae*)

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2.1 *Hydrellia albifrons* (Dipt., Ephydridae)

We continued host-range testing with the *H. albifrons* population established in our CABI garden. No-choice larval development tests were set up with three non-target species; *Hydrocharis laevigata*, *Potamogeton perfoliatus* and *P. amplifolius*. Single pairs of the fly were set up in cylinders for oviposition on *H. morsus-ranae*, and three eggs each were transferred on either controls or non-target species. Dual-choice tests with larvae were setup in tubs of 40 x 30 x 22 cm. Control plants were set up in opposite corners and non-target plants were placed in the other opposite corners. Ten eggs were deposited on a floating platform with moist filter paper positioned at the centre of the tub. The first larval mines were observed one week after the experiment was initiated. After a week exposure period, the location of larval mines were recorded, and each individual plant was transferred to a separate rearing cylinder and maintained until pupation. Tests are ongoing but, emerging adults will be collected and submitted for DNA analysis to confirm their identity.

2.2 *Bagous puncticollis* (Col., Curculionidae)

In 2026 we were able to collect over 120 *Bagous puncticollis* weevils. Their behaviour in the field is interesting where adults prefer to hide during the day in relatively dry locations such as leaf litter or on emergent vegetation, presumably feeding on *H. morsus-ranae* at night. After several attempts in the lab, we were finally able to obtain oviposition on *H. morsus-ranae* in our rearing trials. We have currently harvested over 100 eggs and have had our first adult emerging. As with previous years larval development is tied to the presence of turions and the larvae will only develop on them. We are observing some development on stolons and currently testing various setups to improve the rearing conditions and develop host range testing protocols. Since we were able to obtain several eggs preliminary host range tests have been setup with turions of *Stratiotes aloides* and stems of *Elodea densa* and *Elodea canadensis*. These test plants were chosen because they have been recorded as potential hosts in the literature.

Tarla Murphy looking for turions of *Hydrocharis morsus-ranae* in a caged rearing pool.

3 Water Soldier (*Stratiotes aloides*)

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3.1 *Hydrellia tarsata* (Dipt., Ephydridae)

Adults of the ephydrid fly *H. tarsata* emerged from plants collected in Germany, Hungary and Slovakia. As with the *Hydrellia albifrons* on European frogbit, adults were set up for oviposition in cylinders with leaves of the host plant and a mix of yeast and sugar offered in a yellow lid. Eggs obtained are being used to improve rearing and develop host range testing techniques.

Adult *Bagous binodulus*.

3.2 *Bagous binodulus* (Col., Curculionidae)

Stratiotes aloides is recorded as only host of the leaf and root crown mining weevil *Bagous binodulus*. However, it is considered as very rare or locally extinct across Central and Northern Europe. During a field trip from 14 to 17 July in Hungary and Slovakia, we found *B. binodulus* at seven sites and collected about 50 adults. Thus, the species is more common than expected, at least in this region. Larval feeding causes obvious damage, especially in leaf bases and the root crown, but also in turions, flowering buds and fruits. Several plants were completely wilted containing several dozen larvae. We are currently studying the biology of this weevil to establish a rearing colony. Females oviposit in leaves and turions, and larvae of all three instars were found during dissections of plants with the first larvae from eggs collected in the lab successfully pupating. Thus, we had a very successful start in understanding the biology of this weevil and getting a rearing established.

Water soldier plant damaged by larval feeding of *Bagous binodulus*.

Corentin Lebet and Melvin Chavanne searching for potential biological control agents at a water soldier site in southern Germany.

First instar *Lysathia cilliersae* larvae prepared for temperature-dependent development.

Listronotus marginicollis larvae mining causing stem dieback in the rearing.

4 Parrot's feather (*Myriophyllum aquaticum*)

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4.1 *Lysathia cilliersae* (Col., Chrysomelidae)

Host-range testing with the leaf beetle, *Lysathia cilliersae* is progressing steadily with a multiple generation experiment set up with *Myriophyllum hippuroides*. Initially setup with 20 naive larvae per species, *M. hippuroides* or *Myriophyllum aquaticum*. Development is currently being tracked and adults emerging are placed onto fresh stems of the same species they developed, to record female fecundity. Provided successful development to the next generation the experiment will be repeated for at least three generations. These data will be used to model the potential population buildup of *L. cilliersae* on non-target plants.

The thermal physiology of *L. cilliersae* is also progressing well, with the final temperature-dependent development tests set at 22°C and 24°C. From the data obtained so far, the theorical lower temperature threshold was estimated at 11.5°C for egg to adult and the thermal constant is approximately 257 degree-days. Although still ongoing we plan to run the first attempts at modelling to understand its winter survival in western North America.

4.2 *Listronotus marginicollis* (Col., Curculionidae)

We obtained a culture of the stem mining weevil, *Listronotus marginicollis* from the rearing in CABI UK thanks to Anna Tilling and Dr. Corin Pratt. Since, efforts have been made to stabilize the rearing and build up the population. We were able to set up a pilot study to test no-choice oviposition. Ten stems of *M. aquaticum* were planted in containers with soil and water, then placed in a mesh cage. Using the same methods, in another cage ten stems of *Proserpinaca palustris* were prepared. Before the test, stems were measured in length and the diameter at three points along the stem. After exposure to adults the number of probing holes, feeding marks and larval tunnelling were recorded. Larval mine development was checked every seven days. While we observed tiny mines during the first two weeks on *P. palustris* and controls, we did not observe late instar larval growth. At this point the test was stopped concluding that larval development failed. We plan to setup additional tests as soon as the numbers are stable enough.

Summer student, Emilie Lab, working with *Lysathia cilliersae* in the quarantine facilities.

5 Flowering rush (*Butomus umbellatus*)

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Bagous nodulosus male with blue mark on impact experiment (Photo: C. Lebet).

5.1 *Bagous nodulosus* (Col., Curculionidae)

In spring 2026, we learned that the adult weevils of *Bagous nodulosus* leave the pools and ponds in fall for overwintering. Thus, in April we placed sentinel plants around the pools and over 500 individuals were collected. In May, 110 weevils were sent to Sidney, Montana, and to Toronto for rearing and for setting up nursery pools. For the ongoing impact experiment, given that the weevils left the pools in fall 2025, we decided to release 72 pairs equally split between the four pools in spring 2026. With the large number of weevils available this year we initiated thermophysiology tests. So far, we have been able to measure the critical thermal limits with CTmax = 53.65 ± 0.24°C, CTmin = -2.45 ± 0.28, chill coma = -3.23 ± 0.24, lower lethal temperatures, LLT50 = −13.55 °C, whereas the LLT99 was below −17.0 °C with the supercooling point (SCP) at −12.4 ± 0.36 °C. These preliminary results are an important insight into the thermophysiology of *B. nodulosus*.

Setup of the combined impact experiment with the weevil *Bagous nodulosus* and the fly *Phytoliriomyza ornata*.

5.2 *Phytoliriomyza ornata* (Dipt., Agromyzidae)

We continued to maintain a rearing colony of the agromyzid fly *P. ornata* and obtained about 260 overwintering puparia on the first generation. The number of puparia obtained per plant appears to decrease each year. To exclude possible inbreeding effects, we collected additional puparia of *P. ornata* in Hungary in an attempt to add fresh material to the gene pool of our rearing colony. In April we set up a combined impact experiment with the agromyzid fly *P. ornata* and the weevil *B. nodulosus*. We set up three treatments with controls, only *P. ornata* (total of three pairs) and *P. ornata* (three pairs) and *B. nodulosus* (one pair).

5.3 *Doassansia niesslii* (Fungi, Doassansiaceae)

In 2026, research has continued to focus on the development of an inoculation technique to assess the ability of the Romanian isolate to infect submerged plants. Symptoms developed normally, indicating successful infection of submerged plants. We believe this will be complimentary to the biological control programme.

Summer students Tarla Murphy and Corentin Lebet observing *Bagous nodulosus* on pools of an impact experiment on flowering rush.

Rhizome-galling tephritid fly *Oxyna nebulosa* on a rosette of oxeye daisy.

Root-feeding weevil *Cyphocleonus trisulcatus* on a leaf of oxeye daisy.

6 Oxeye daisy (*Leucanthemum vulgare*)

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6.1 *Dichrorampha aeratana* (Lep., Tortricidae)

In May, we provided 2500 eggs of the rhizome-feeding tortricid moth *Dichrorampha aeratana* to Dr Jeffrey Littlefield (Montana State University in Bozeman) and 2500 eggs to Dr Andrew McConnachie (New South Wales Department of Primary Industries and Regional Development in Orange) to supplement their rearing colonies. We continue to maintain a rearing colony of *D. aeratana* at CABI to facilitate future shipments to North America and Australia. *Dichrorampha aeratana* has been approved for release in Canada in 2022 and releases and post-release monitoring are ongoing. In the US, the USDA-APHIS Technical Advisory Group (TAG) recommended release of *D. aeratana* in 2022, but a release permit has yet to be issued.

6.2 *Dichrorampha consortana* (Lep., Tortricidae)

In May 2026, we conducted a field trip to Norway to re-collect the shoot-feeding moth *Dichrorampha consortana*. Rosettes with larvae were collected and moths started emerging in late June. In July, we conducted no-choice larval development tests with several non-target species. In addition, we also re-established a rearing colony.

6.3 *Oxyna nebulosa* (Dipt., Tephritidae)

Testing with the rhizome-galling tephritid fly *Oxyna nebulosa* was completed in 2024, and a petition for field release is in preparation. We also continue to maintain a rearing colony for potential shipments to North America.

6.4 *Cyphocleonus trisulcatus* (Col., Curculionidae)

Testing with the root-feeding weevil *Cyphocleonus trisulcatus* for Australia at CABI was completed in 2021, but we continue to maintain a rearing colony at CABI for shipments to Australia. In May 2026, we provided approximately 200 weevils from our rearing colony to Dr Andrew McConnachie to supplement his rearing colony in the quarantine facility in Orange, NSW.

Summer student Duarte Costa placing plants infested with larvae of *Dichrorampha consortana* in a field cage.

7 Common tansy (*Tanacetum vulgare*)

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7.1 *Microplontus millefolii* (Col., Curculionidae)

In April, the stem-mining weevil *Microplontus millefolii* was approved for release in Canada and in May our collaborators from AAFC and the British Columbia Ministry of Forests released the first weevils in Alberta and British Columbia. A petition for field release was also submitted to the US authorities in 2025 and the USDA-APHIS Technical Advisory Group (TAG) recommended release in spring 2026, but a release permit has yet to be issued.

Stem-mining weevil *Microplontus millefolii*.

7.2 *Gillmeria ochrodactyla* (syn.: *Platyptilia ochrodactyla*) (Lep., Pterophoridae)

Females of *Gillmeria ochrodactyla* oviposit in open flower heads in summer where early instars begin to feed and develop and then overwinter in the seed heads. In the following spring, the larvae move to the newly growing shoots where they burrow short mines. We therefore conduct host-specificity testing in spring with early instar larvae and again in summer with ovipositing females.

In April and May, we conducted no-choice larval transfer tests using 29 non-target species and *T. vulgare* as a control. Adults emerged from 13 of these species, three of which are native to North America (*Tanacetum camphoratum*, *T. huronense* and *Matricaria occidentalis*). In April, we also conducted an open-field test where we placed *T. vulgare* seed heads with *G. ochrodactyla* larvae next to 12 non-target species. In this test, larvae were found in all of the exposed species, indicating that spillover attack my occur if these non-target species grow close to *T. vulgare*.

Flower-head and stem-mining moth *Gillmeria ochrodactyla* on flower heads of common tansy.

On 14 and 15 May, about 900 shoots attacked by *G. ochrodactyla* were collected in western Germany. The emerging moths were used to set up no-choice oviposition tests with flowering non-target species that had supported partial or complete larval development in previous larval transfer tests as well as an open-field test with species that supported oviposition under no-choice conditions. These tests will be evaluated later this summer.

Summer students Melvin Chavanne and Duarte Costa preparing an open field test with *Gillmeria ochrodactyla*.

Eggs of *Cheilosia urbana*.

Female *Aulacidea pilosellae.*

8 Hawkweeds (*Pilosella* spp.)

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8.1 *Aulacidea pilosellae* (Hym., Cynipidae)

Two biotypes of this gall wasp are being investigated. We completed testing a northern range population from Poland, biotype 1, *Aulacidea pilosellae* ex *Pilosella* spp. We have initiated a joint petition for the release of this biotype in North America in collaboration with Dr Rosemarie DeClerck-Floate (AAFC, Lethbridge), Dr Chandra Moffat (AAFC, Summerland) for Canada and Dr Jeffrey Littlefield (Montana State University, Bozeman) for the US.

In order to maintain the rearing colony, batches of galls harvested from lab infested plants in 2025 were taken out of cold storage in April 2026. These emerging adults were used to infest fresh plants. Galls from these plants will be collected later in the season and placed in cold storage for emergence in 2027.

8.2 *Cheilosia urbana* (Dipt., Syrphidae)

In late April, 33 females of the root ming fly, *Cheilosia urbana* females were collected in the CABI garden. About 770 eggs were harvested and shipped together with the single remaining live female to AAFC, Summerland on 5 May. Upon arrival, eggs and larvae emerging from these eggs were transferred onto potted plants for field releases in spring the following year.

Summer student Melvin Chavanne harvesting eggs of *Cheilosia urbana* for shipment to AAFC.

9 Swallow-worts (*Vincetoxicum* spp.)

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9.1 *Chrysochus asclepiadeus* (Col., Chrysomelidae)

The root-mining beetle *Chrysochus asclepiadeus* can develop and emerge as an adult over 1-3 years. Adults in Franche Comté, France, are active between the end of June and the end of July. the adult lay eggs in the soil near the plants and the larvae feed externally on the roots for a period of 1-3 years. During no-choice tests, the roots and soil are checked for larvae the following year in April–May. Plants with larvae are kept for up to three years for adult emergence.

In spring 2026, we found larvae in 50% of the control plants (*V. hirundinaria* and *V. nigrum*) from tests set up in 2025. No adults have emerged from plant species outside the *Vincetoxicum* genus exposed in larval transfer tests. So far, this year a total of 6 adults emerged from *V. hirundinaria* and *V. nigrum* set up in 2023, 2024 and 2025. In tests conducted between 2019 and 2023, no adults emerged from larvae found on *Asclepias incarnata*, *A. rubra*, *A. syriaca* and *A. tuberosa*. Larval survival after about eight months on these test plants was 1.5% vs. about 19% on the controls. None of the 19 other exposed test plants (12 native to North America) were attacked. These are encouraging results, similar to previous tests with the Ukrainian population of the beetle.

Chrysochus asclepiadeus on *Vincetoxicum hirundinaria* in the field in France.

Summer student Melvin Chavanne checking emergence of *Chrysochus asclepiadeus* on no-choice larval transfer tests.

Female *Melanagromyza albocilia*.

10 Field bindweed (*Convolvulus arvensis*)

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10.1 *Melanagromyza albocilia* (Dipt., Agromyzidae)

The shoot- and root-mining fly *Melanagromyza albocilia* shows promise as a potential biological control agent for field bindweed. However, our attempts at conducting host range tests under confined conditions yielded low success. Therefore we are focussing on tests under field conditions where the fly occurs naturally. In June 2026, the density of the fly in the field in southern Germany was much lower than in previous years thus, we postponed the experiment. At the beginning of July, eight North American native test plant species, and *Convolvulus arvensis*, were embedded into the ground at the edge of a maize field. The plants will be recollected beginning of August and results of dissections will be presented in the annual report.

Of the ca. 180 pupae collected in the field in 2025 for the no-choice tests in the lab, only six flies emerged in 2026. Due to failure in male and female synchronization no tests could be established. To obtain adults to conduct additional testing in the lab in 2027, infested *C. arvensis* plants will be collected in southern Germany.

10.2 *Microsphecia brosiformis* (Lep., Sesiidae)

This root-mining sesiid moth *Microsphecia brosiformis* is difficult to collect owing to its low densities in the field. This year with temperatures above 40°C during the peak period of activity did make things easier and only two females were collected. These laid 11 eggs, which were insufficient for setting up tests. Test plants and field bindweed growing in the garden in view of open-field tests also suffered from the high temperatures and drought.

Summer student Emilie Lab setting up an open-field test with *Melanagromyza albocilia* in southern Germany.

11 Garlic mustard (*Alliaria petiolata*)

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Adult *Ceutorhynchus constrictus.*

11.1 *Ceutorhynchus constrictus* (Col., Curculionidae)

In February and March, ca. 600 adults of the seed-feeding weevil *Ceutorhynchus constrictus* emerged from our rearing colony established in 2025. Adults were placed onto potted garlic mustard plants. In Canada, garlic mustard plants are delayed compared to Switzerland. Thus, to synchronise adults with the Canadian phenology, our storage plants were kept in a climatized room at 8°C with 12h light and flowers were only offered one week before the shipment. On 5 May, about 200 females and 190 males were shipped to AAFC Ottawa for field releases in Ontario, Alberta and British Columbia. The remaining fertile females were used at CABI for rearing on *A. petiolata*.

11.2 *Ceutorhynchus scrobicollis* (Col., Curculionidae)

Between May and July, adults of the root-crown weevil *Ceutorhynchus scrobicollis* emerged from rearing plants infested in 2025. So far, ca. 85 live adults were recovered from these plants and are kept on potted garlic mustard rosettes for aestivation. Weevils will either be shipped to North America in autumn or kept at CABI to maintain the rearing.

Melvin Chavanne releasing adults of *Ceutorhynchus constrictus* onto individual rearing plants in the greenhouse.

Summer student Emilie Lab preparing *Lepidium draba* rearing plants for *Ceutorhynchus cardariae.*

12 Whitetop or Hoary cress (*Lepidium draba*)

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12.1 *Ceutorhynchus cardariae* (Col., Curculionidae)

Adults of the gall-forming weevil, *C. cardariae* start to lay eggs from early spring until about mid-May. Usually, female egg-laying leads to the formation of galls on leaf stalks and stems of whitetops. Larvae feed inside the galls and, when mature, leave them to pupate in the soil. Adults of the new generation emerge from mid-May onwards. Development from egg to adult takes about 12 weeks. Newly emerged adults feed for 2–3 weeks and then become inactive and aestivate over the summer.

In 2026, we continued maintaining a rearing colony of this weevil at CABI. Of the 3627 adults that overwintered from 2025, about 55% survived. Between January and April, about 1800 of these weevils were sent to Dr Mark Schwarzländer at the University of Idaho for studies on the host-finding behaviour. The remaining adults were set up on potted plants and about 1200 *C. cardariae* emerged in 2026.

12.2 *Ceutorhynchus turbatus* (Col., Curculionidae)

Unfortunately given the uncertainty around funding at the beginning of the year and the need to reduce workplans, no work was possible with this species in 2026. We hope to recommence with host range testing in the spring of 2027.

Typical galling and leaf deformation caused by *Ceutorhynchus cardariae* on *Lepidium draba*.

13 Perennial pepperweed (*Lepidium latifolium*)

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13.1 *Ceutorhynchus marginellus* (Col., Curculionidae)

No host-specificity testing was conducted with the gall-forming weevil *Ceutorhynchus marginellus* in 2026, but we continued to maintain a rearing colony of this species in our quarantine.

From the 500 weevils that were overwintered in an incubator set at 2.5°C, 337 overwintered successfully and were set up on PPW plants in February 2026. From these plants approximately 2000 weevils emerged in April. In June, 800 of these weevils were sent to Dr Mark Schwarzländer at the University of Idaho for studies on the host-finding behaviour.

Adult of *Ceutorhynchus marginellus* on perennial pepperweed.

Larvae of *Ceutorhynchus marginellus* on perennial pepperweed.

Summer student Melvin Chavanne collecting stems of perennial pepperweed to feed *Ceutorhynchus marginellus* from the rearing colony.

Isatis tinctoria plants showing signs of root damage by *Ceutorhynchus rusticus* in southern Germany.

14 Dyer's woad (*Isatis tinctoria*)

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14.1 *Ceutorhynchus peyerimhoffi* (Col., Curculionidae)

The petition for field release of the seed-feeding weevil, *Ceutorhynchus peyerimhoffi* was submitted to USDA-APHIS Technical Advisory Group (TAG) in 2025 and recommended for release in spring 2026, but a release permit has yet to be issued. In the meantime, we continue the rearing and from adults which emerged from our rearing colony this spring, we transferred 587 onto flowering dyer's woad plants for rearing. Over 4000 larvae were collected and are being kept for adult emergence in 2026.

14.2 *Ceutorhynchus rusticus* (Col., Curculionidae)

The host range testing of the root-crown mining weevil *Ceutorhynchus rusticus* has been completed and we plan to prepare a petition for field release to be submitted to the USDA-APHIS Technical Advisory Group (TAG). In autumn 2026, we are planning to visit the field site to collect adults to setup a rearing colony given the extreme weather conditions observed over the last couple of years, a rearing colony will act as a backup for the field population.

Josh Shorb of Park County Weed & Pest, Wyoming inspecting *Isatis tinctoria* plants in southern Germany for *Ceutorhynchus rusticus*.

15 Tree of heaven (*Ailanthus altissima*)

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15.1 *Aculus taihangensis* (Syn: *Aculus mosoniensis*) (Acari, Eriophyidae)

Practical and experimental work with the eriophyid mite *Aculus taihangensis* is being done at BBCA in Rome, Italy.

In 2026, host-specificity tests were continued with *Castela erecta*, a species belonging to the tree-of-heaven family (Simaroubaceae). For this, plants were grown from seeds, and once they were about 15-20 cm tall, three *C. erecta* and three tree of heaven seedlings (used as controls), were each inoculated with 20–30 mites by attaching an infested tree of heaven leaf to each seedling. Inoculated seedlings were maintained under controlled conditions in the laboratory for six weeks and then harvested, and the mites extracted and counted. Tree of heaven seedlings had an average of more than 80,000 live mites per plant, while less than 2 live mites were found on each of the *C. erecta* seedlings (two and three on two seedlings, respectively). Symptoms of mite infestation (i.e., deformed leaves, and/or drying and premature leaf loss) were only observed on the tree of heaven plant, and not on the *C. erecta* plants.

As host-specificity testing with *A. taihangensis* for Canada has been completed, we also started preparing the petition for field release by summarizing the data collected on the host specificity, impact, and biology of this mite.

Method used to inoculate tree of heaven with the eriophyid mite *Aculus taihangensis*.

Symptoms on tree of heaven seedling observed six weeks after its inoculation with *Aculus taihangensis*.

Silvia Barlattani (BBCA) potting tree of heaven and *Castela erecta* seedlings for the host-specificity tests with *Aculus taihangensis*.

Linaria dalmatica of North American origin prepared for oviposition for *Mecinus laeviceps* and *Mecinus peterharrisi* in 2026.

16 Dalmatian and Yellow Toadflax (*Linaria* spp.)

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16.1 *Rhinusa pilosa* ex *Linaria vulgaris* and *R. rara* ex *L. genistifolia* (Col., Curculionidae)

In 2026, we continued rearing *Rhinusa pilosa* genotypes using an established rearing protocol. The applied method yielded good results with 2994 adults. This spring we conducted rearing with females belonging to 10 determined haplotypes. The rearing resulted in 140 adults of haplotype A1, 295 A4, 450 A7, 230 A9, 249 A10, 41 A13, 263 A18, 118 A19, and 722 adults of haplotype B7. In addition, 139 adults were propagated for a mixture of populations from adults originating from field-collected material as well as adults from a mixed population of A3 and A13 haplotypes. The offspring of females from this mixed population will be genetically examined in 2027 to determine their haplotype affiliation.

In 2026, we propagated 517 adults using 18 *R. rara* females, which confirms the stability of the rearing method in controlled conditions for this weevil.

16.2 *Mecinus laeviceps* and *M. peterharrisi* (Col., Curculionidae)

During spring and summer 2026, we continued with establishing rearing colonies and developing mass rearing protocols for *Mecinus* spp. This year we partly modified the rearing protocol using 3 females and 3 males per single trial. For *M. laeviceps* we set up 24 trails, i.e., 72 females and males, between 13 and 14 April on seedlings of *Linaria dalmatica* of North American origin. Propagation of *M. peterharrisi* was conducted in 17 trials using 51 females and 51 males. For both species, the growth tips of the plants for oviposition were carefully clipped several times during winter to produce young, growing shoots 3–4 cm in length. The propagation resulted in 1117 adults of *M. laeviceps* and 321 adults of *M. peterharrisi*.

Rearing of *M. heydenii* was set up in 5 trails using 5 females and 5 males per trail. The rearing resulted in a total of 401 adults.

Dr. Ivo Toševski checking on the set up of *Rhinusa* weevils for propagation in 2026.

17 Common reed (*Phragmites australis*)

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17.1 *Archanara neurica* and *Lenisa* (*Archanara*) *geminipuncta* (Lep., Noctuidae)

In 2026, we continued producing as many pupae of the stem-mining moth *Lenisa geminipuncta* as possible to support further field releases in Canada. Both species of moth, *L. geminipuncta* and *Archanara neurica* are establishing well at the release sites in Canada, however, in the past the number of *L. geminipuncta* CABI was able to ship were always lower than those of *A. neurica*. Thus, the decision was made to focus on *L. geminipuncta* in 2026. The rearing was exceptionally successful this year and after 28 years, this marks the completion of our work at CABI on the biological control of common reed with a last shipment of 480 pupae of *L. geminipuncta*.

Lenisa geminipuncta third instar larvae entering a stem of *Phragmites australis.*

Male pupa of *Lenisa geminipuncta*.

Emilie Lab and Philip Weyl in the field collecting *Phragmites australis* stems for moth rearing.

Mogulones borraginis adult on a flower of *Cynoglossum officinale.*

18 Houndstongue (*Cynoglossum officinale*)

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Current work on houndstongue is focused on the seed-feeding weevil *Mogulones borraginis*. It has proven to be the most specific agent acting on houndstongue thus far. CABI Switzerland is maintaining a rearing of the weevil in view of future field releases since *M. borraginis* is extremely rare in the field in Europe and therefore hard to collect.

From over 5800 *M. borraginis* larvae collected in 2025, about 130 adults emerged in November 2025, and an additional 2900 in March 2026 which were set up on houndstongue rosettes and/or shipped to the USA. At the end of May/beginning of June, about 122 females were retrieved and reset on 53 flowering-seeding houndstongue plants. By mid-July, fruit bearing inflorescences were covered individually with gauze bags and vials attached to the end of each bag to collect mature larvae leaving the fruits. About 400 *M. borraginis* larvae emerged and were separated into cups (30 individuals per cup) and placed in an underground insectary for adult emergence in autumn 2026 and spring 2027.

In January and April 2026, a total of 2480 adults of *M. borraginis* were sent to the quarantine facility at the University of Idaho run by Dr Mark Schwarzländer. Currently, work is focused on developing the most effective way to rear *M. borraginis* under quarantine conditions to maximize space and number of adults.

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19 Japanese knotweed (*Reynoutria japonica*) work in the UK

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Severe leaf-curling damage caused by the psyllids in bohemian knotweed populations in August 2025.

19.1 *Aphalara itadori* (Hemiptera, Psyllidae)

Japanese knotweed (*Reynoutria japonica*), giant knotweed (*R. sachalinensis*) and their hybrid, bohemian knotweed (*R.* x *bohemica*) have become serious invasive weeds in North America. The psyllid *Aphalara itadori*, a natural enemy from the knotweeds' native range, has been prioritised as a classical biological control agent.

In 2019, a new line of the psyllid, collected in Murakami, Niigata Prefecture, Japan (Murakami line) was found causing severely curled leaves. We believe that the leaf-curling damage is induced by feeding behaviour of the Murakami psyllids; however, the underlying mechanism remains unknown. Therefore, bacterial and viral diversities in the psyllids and plant samples using the MinION sequencing platform have commenced to identified microorganisms contributing to the leaf curling damage.

Bacterial community composition differed between the Kyushu and Murakami psyllid lines across development. In the Kyushu line, *Sodalis* was the dominant genus in eggs (36.61%), nymphs (59.74%), and adults, with *Klebsiella* and *Escherichia* also present at lower abundances. In contrast, the Murakami line was dominated by *Klebsiella* during the egg (23.06%) and nymph (17.16%) stages, while *Sodalis* became predominant in adults (29.57%).

For the virome analysis, RNA was successfully extracted from adults of both psyllid lines and their host plants; however, cDNA sequencing coverage from the Murakami line and host samples was insufficient for reliable virus detection and identification. In contrast, analysis of the Kyushu line revealed three previously undescribed viruses.

UK field site of bohemian knotweed population released with the psyllid *Aphalara itadori*.

Impatiens glandulifera leaf ex Gwilli Railway, Wales, infected in the field with the rust *Puccinia komarovii* var. *glanduliferae.*

20 Himalayan balsam (*Impatiens glandulifera*) work in the UK

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20.1 *Puccinia komarovii* var. *glanduliferae* (Fungi, Pucciniaceae)

In 2014 the rust fungus *Puccinia komarovii* var. *glanduliferae* was approved for release in the UK as a biocontrol agent for Himalayan balsam. To date, two strains, originating from India and Pakistan, have been released. Concurrently, the rust has been evaluated for its potential use in Canada. Host specificity testing against 47 species of specific relevance to North America further confirmed its high specificity, with no non-target impacts reported. Despite these promising results, the two strains currently released in the UK have shown reduced virulence against Canadian populations of Himalayan balsam. Many of these populations exhibit resistance to infection, particularly to the Pakistan strain. As a result, additional rust strains with greater pathogenicity are required to achieve effective biological control in Canada.

To address this challenge, to date, three additional rust strains have been evaluated against Canadian populations of the weed. However, none have demonstrated consistently high levels of virulence. Consequently, assessments of rust efficacy against Canadian populations have been placed on hold, pending the discovery of new strains with improved virulence and the availability of additional funding to support further research and evaluation.

CABI scientist Sonal Varia monitoring a Himalayan balsam seedlings for signs of overwintering of the rust.

21 Les plantes en mouvement

Lauréline Humair and **Philip Weyl**

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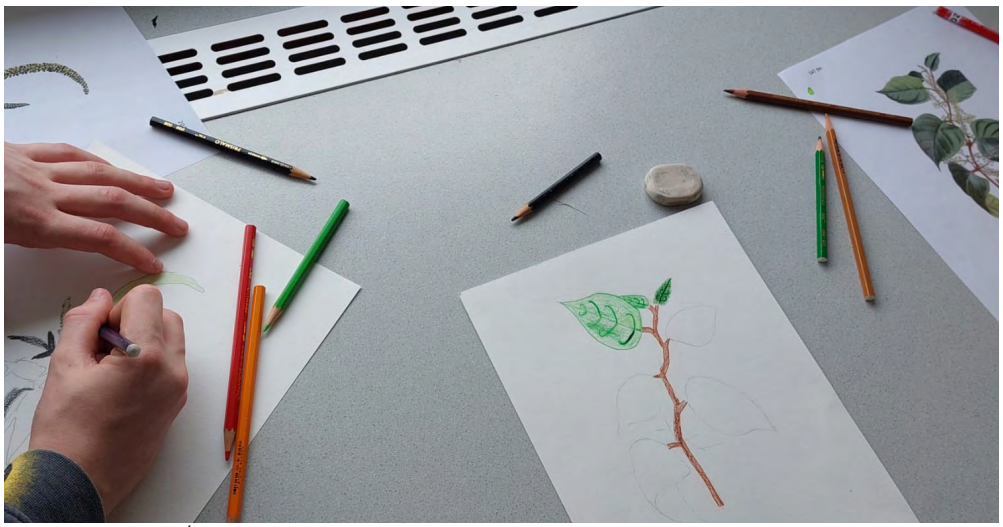
Summer students, Tarla Murphy and Emilie Lab installing the first information board at the Colliard, Delémont.

For many years, CABI maintained a regional partnership with the Canton of Jura that supported a wide range of activities, including teaching at schools, citizen science initiatives, and the supervision of bachelor's and master's students. With the end of this contract in 2025, efforts were made to develop new local collaborations and strengthen CABI's engagement on invasive plants within both the region and Switzerland. A proposal was submitted to the Canton, which included educational activities and a public awareness campaign on invasive plant species, centred around the installation of information boards and boot brush stations at strategic outdoor locations. Although the proposal was not funded at the cantonal level, it generated considerable interest.

Each year, the *École Secondaire de la Haute-Sorne*, located in the village of Bassecourt, selects a local project to support. As biodiversity was the school's annual theme, the initiative entitled *Les plantes en mouvement* ("Plants on the move") was chosen. Students actively participated by finding sponsors and taking part in an orienteering race to raise funds for the project. They also contributed to the design of the information boards by creating drawings of invasive plant species in the region. Thanks to their enthusiasm and support, CABI was able to produce four information boards with associated boot brushes, which will be installed at strategic locations across the Canton of Jura. These stations will serve a dual purpose. Firstly, to raise public awareness of invasive plants and their spread. Secondly, encourage visitors to clean their footwear and reduce the accidental spread of invasive plant seeds. This will provide an opportunity for CABI to collect the seeds trapped in the brushes. Analysing these seeds will help identify which plant species (native and invasive) are being transported by people, providing valuable information on seed dispersal pathways and contributing to future research and management efforts.

The information board presented to the public to raise awareness on invasive plant species in the canton of Jura.



Students from the "École Secondaire de la Haute-Sorne" (ESHS) drawing invasive plants species displayed on the informative board.

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