

BIOLOGICAL CONTROL OF BLUEWEED

Locations	Canada
Dates	01/04/2023 - Ongoing
Summary	Blueweed, <i>Echium vulgare</i> , is a biennial plant native to Europe and Asia that has become a problematic weed in pasture and rangelands of North America where it is classed as noxious. Biological control can be used to help manage the weed. CABI has been tasked with identifying and studying specialist natural enemies from Europe and Asia that can be potentially introduced into North America as biological control agents.
The problem	Blueweed, <i>Echium vulgare</i> (Boraginaceae), is a biennial to short-lived perennial plant with a large taproot – a straight root from which other roots sprout. Originating from Europe and Asia, the species was introduced to North America sometime during early settlement and spread widely during the 1800s and 1900s. In western Canada, it is currently listed as noxious in Alberta, and in central and southern regions of British Columbia (Cariboo, Central Kootenay, Columbia-Shuswap, East Kootenay, Okanagan-Similkameen and Thompson-Nicola Regional Districts). It is also an invasive species in several states of the US, including Idaho, Washington and Montana.

	Blueweed invades a wide range of habitats including pastures and rangelands. However, because the plant is unpalatable and toxic to livestock, it is left to displace desirable forage plants in otherwise productive prairies and rangelands.
	Biological control is a method that can be used to manage blueweed. However, steps to use biological means against it in North America have not yet been taken.
	In Australia, seven insect biological control agents were introduced against the closely related species Paterson's curse, <i>Echium plantagineum</i> . At least three of them have contributed to the successful control of this pasture weed.
	Since these insect species are also associated with blueweed in Europe, they may have potential as biological control agents for this weed in North America, provided they are host-specific enough.
What we are doing	CABI is working to find a biological control agent that will successfully help to control the invasive blueweed in North America.
	In 2023, CABI received funding from the Ministry of Forests, British Columbia to conduct a literature survey for potential biological control agents for blueweed.
	This review revealed 94 insects, one mite and seven pathogen species from blueweed. Of these, seven insects, one mite and three plant pathogen species are reported exclusively from the genus <i>Echium</i> , i.e., the genus blueweed belongs to. Based on the available information on their impact and narrow host range, the root-feeding weevil <i>Mogulones geographicus</i> and the gall-forming eriophyid mite <i>Aceria echii</i> were prioritized for further studies in 2024.
	<i>Mogulones geographicus</i> is already successfully used as a biological control agent for Paterson's curse in Australia while the biology and host specificity of <i>A</i> . <i>echii</i> is yet to be studied.
Results so far	In 2024, we conducted field surveys in Switzerland and southern Germany and identified several collection sites of the weevil <i>M. geographicus</i> and the eriophyid mite <i>A. echii</i> . We collected both species and are currently conducting studies to understand their biology and to establish methods for host-specificity testing.
	In 2025, we plan to continue our studies on the biology and start with host- specificity testing using North American plant species.
	Main header image: Blueweed. Credit: Pixabay, jhenning
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