Control of invasive plants and habitat restoration

Michael Irvine
Ontario Ministry of Natural Resources
Integrated Pest Management

- Historical context
- Concepts
- How it can help us with invasive plant management
❖ Oversimplified agricultural systems
❖ Environmental awareness
❖ Pesticide misuse overuse resistance
❖ Advances in analytical techniques
What is IPM?

- Thresholds
- Prevention
- Monitoring
- Consider all control methods
IPM:

- Knowledge-based
- Not pro- or anti- anything
- Context
- Regulatory environment
- Risk analysis
- Registrations
- Land ownership
- Better detection
- Consolidated databases
What are the risks?

- **Risks of action**
  - Immediate
  - Attributable to individual
  - Costs in present

- **Risks of inaction**
  - Become apparent in the future
  - Anonymous
  - Costs in future
DMSP F15
15 August 2003
0114Z
~7 hrs after Blackout

Photo credit: NOAA
Sonchus palustris L.  Marsh sow-thistle – laïteron des marais

Stephen Darbyshire  Agriculture and Agri-Food Canada, Ottawa, Ontario, K1A 0C6, Canada
<darbyshires@agr.gc.ca>

Marsh sow-thistle is a perennial Eurasian species. It produces dense colonies with the hollow stems up to about 5 metres tall (Fig. 1 & 2). The stems are killed by frost and can accumulate in extensive piles of litter (Fig. 3). Vegetative reproduction is from extensive budding at the root crown (Fig. 4). The leaves are similar to other species of Sonchus. Basal leaves (Fig. 5) are shallowly or deeply lobed like S. arvensis (field sow-thistle). The upper leaves (Fig. 6) are not lobed, but are finely toothed with short prickles. The base of the upper leaves has acute downward pointing auricles and the mid-vein is decurrent on the stem as a ridge (Fig. 6). The flowers of marsh sow-thistle (Fig. 7) are about half the size of field sow-thistle. Like the typical form of field sow-thistle, the inflorescence of marsh sow-thistle is densely glandular hairy, but it is more compact and with more flower heads in the latter.

It is known to be introduced to North America at two widely separated sites in Ontario (Fig. 8). The Cambridge population (to the southwest) was first discovered in 1972 and the Ottawa population (the northeast site) in 1992, although both had probably been present for some time before discovery. At the Cambridge site plants occur along an old rail line and adjoining fields. John Morton reports that in 2002 the population had decreased by about half from the 1994 state, due to development in the immediate area. At Ottawa, the population has greatly expanded in the last 10 years and spread along the wet roadside ditches in the area.

References:

All photos taken at the Ottawa site in either May or August 2002.
The Biology of Invasive Alien Plants in Canada. 2. 
*Cynanchum rossicum* (Kleopow) Borhidi [= *Vincetoxicum rossicum* (Kleopow) Barbar.] and *Cynanchum louiseae* (L.) Kartesz & Gandhi [= *Vincetoxicum nigrum* (L.) Moench]

Antonio DiTommaso¹, Frances M. Lawlor², and Stephen J. Darbyshire²

¹Department of Crop and Soil Sciences, Cornell University, Ithaca, NY, 14853 USA (email: ad67@cornell.edu); 
²Central and Western New York Chapter - The Nature Conservancy, 269 Onderkirk Rd., Pulaski, NY 13142 USA; ³Agriculture and Agri-Food Canada, Central Experimental Farm, Saunderson Building 449, Ottawa, Ontario, Canada K1A K6B. Received 3 April 2005, accepted 3 September 2004.

DiTommaso, A., Lawlor, F. M. and Darbyshire, S. J. 2005. The Biology of Invasive Alien Plants in Canada. 2. *Cynanchum rossicum* (Kleopow) Borhidi [= *Vincetoxicum rossicum* (Kleopow) Barbar.] and *Cynanchum louiseae* (L.) Kartesz & Gandhi [= *Vincetoxicum nigrum* (L.) Moench]. Can. J. Plant Sci. 85: 243–263. *Cynanchum rossicum* (dog-strangling vine) and *C. nigrum* (black dog-strangling vine) are introduced, perennial herbs or small twining vines in the Milkweed family (Asclepiadaceae). Genetic placement of these two species has been problematic, but are here treated as members of *Cynanchum subgenus Vincetoxicum*. The species occur primarily in natural upland areas, including woodlands, pastures, old fields, shores, flood plains and marshy areas of eastern Ontario and Quebec and the northeastern United States. Ecosystems on well-drained, stony soils are often densely colonized, but both species can tolerate a wide moisture regime. Plants establish in full sun or under forest canopies and may form monospecific stands in all light conditions. They often form dense colonies which reduce other vegetation and reduce invertebrate and vertebrate biodiversity. Reproduction is by polyembryonic, wind-dispersed seeds. Effective control is primarily by herbicides, since mechanical control is difficult and no biological control agents have been developed. A third European species, *C. tritoxicum*, has been reported in an occasional garden escape in southern Ontario and the northeastern United States, but has not yet become naturalized. Information on this species is included because of its close relationship with *C. rossicum* and its better known biology.

Key words: Dog-strangling vine, swallow-wort, Cynanchum, Vincetoxicum, V. KYCN, invasive plant, weed biology


Mots clés: Cynanche, donzette-venin, Cynanchum, Vincetoxicum, V. KYCN, plante envahissante, biologie des mauvais herbes

1. Species Name and Taxonomic Relationships

I. *Cynanchum rossicum* (Kleopow) Borhidi — Synonyms: *Vincetoxicum rossicum* (Kleopow) Barbar. *Cynanchum medius* misapplied, not R. Br.; Vincetoxicum medius misapplied, not (R. Br.) Dein. — dog-strangling vine (Darbyshire et al. 2000); pale swallow-wort (swallow-wort) and swallow-wort (Darbyshire 2003); European swallow-wort (Kartesz 1999); swallow-wort (Christensen 1998); donzette-venin de Russie (Darbyshire et al. 2000)

II. *Cynanchum louiseae* Kartesz & Gandhi — Synonyms: *Cynanchum nigrum* (L.) Pers., not Cav.; *Vincetoxicum nigrum* (L.) Moench – black dog-strangling vine (Darbyshire et al. 2000); black swallow-wort and black swallow-wort, climbing poison, and Louise’s swallow-wort (Darbyshire 2003); Louise’s [sic] swallow-wort (United States Department of Agriculture 2000); donzette-venin noir (Darbyshire et al. 2000).

Asclepiadaceae, milkweed family, Asclepiadoles.

Cynanchum: Greek evos = dog = atochtis = to strangle or poison; alluding to the supposed use of some European species for poisoning dogs and other vermin (Forster 1994). Vincetoxicum: Latin: venos = to conquer, overcome, master, surpass or subdue = toxicum = poison; alluding to its supposed herbal attributes as an antidote for poisons.
Invasive Dog-strangling Vine
(*Cynanchum rossicum*)

Best Management Practices in Ontario
Assessing potential for northern spread

- Laboratory studies
- In-situ studies
Biological control

- Classical
- Innovative approaches

Photo: USDA
Phragmites
Habitat restoration

- Did the plant invasion damage the ecosystem?

- Or did ecosystem damage lead to the invasion?
Iona Island

Photos: M Irvine
Integrated pest management is a concept that can be applied to invasive plant management.

IPM principles are being applied to control dog-strangling vine.

Risk of inaction.

Killing weeds or restoring habitat (is there a habitat to restore)
THANK YOU!