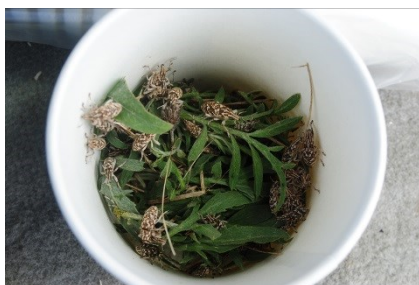


Knapweed Root Weevil (*Cyphocleonus achates*)

IMPROVING BIOCONTROL SUCCESS

STORING

- Collect weevils in breathable containers, place in a cooler on top of ice packs
- Place a towel/newspaper between ice packs and weevil containers to prevent freezing insects
- Keep insects in the refrigerator at a moderate temperature in breathable containers for **up to 3 days**



MONITORING

- Pull up roots to inspect for damage
- Spring - late summer larvae, pupae, or adults can be found in the roots
- Sweep net or visually inspect plant in the late summer - early fall for adults
- Take photos and mark release locations
- Monitoring forms are available through the MT Biocontrol Project at mtbiocontrol.org

RELEASING

- Release 50+ weevils in the summer per site, scatter the insects close together
- A minimum of a 5 acre infestation is ideal
- Prefer hot, dry, well-drained sites with dense patches of knapweed
- Release early in the morning or late in the evening when temperatures are cooler
- Best used in combination with other spotted knapweed biocontrol agents

COLLECTING

- Hand pick the weevils off the tops of knapweed plants in the heat of the day or look under the leaves at the base of the plant during cooler temperatures
- During collection:
 - 50-200 insects per container
 - **Add spotted knapweed foliage to containers (no flowers or seeds)**
 - **Immediately store** as described in storage section
- **It is important to not transfer weed seeds from the collection site to the release site**



BACKGROUND

BIOLOGY

- One generation per year
- Adults emerge late-summer to early-fall
- Females lay eggs on the root crown, just below the soil surface (each female can lay 100+ eggs)
- Larvae mine to the center of the root
- Larvae overwinter in the root
- Larvae pupate into adults in the root in the early summer



Photo credit: Laura Parsons and Cornell University, Bugwood.org

IMPACT

- Small plants can be killed by larval feeding
- Most damage is done when multiple larvae occupy a root, which reduces plant biomass and the density of the infestation
- Tunneling in the root also exposes the plant to bacterial and fungal infections

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