Weed Characteristics and Classification

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A Disclaimer

• This is not going to be a “traditional” weed extension presentation
• Your best weed management tool is located between your ears
What is a weed?
What is a weed?

- A plant that is growing where it is not wanted
  
  Roberts et al. 1982

- A plant out of place
  
  Blatchley. 1912

- A plant that is growing where it is desired that something else growth

  Georgia, 1916

- Those plants with harmful or objectionable habits

  Muenscher, 1946
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  Muenscher, 1946
What are implications of these definitions?

Weed science focuses on mitigating the negative impacts of weeds

Landis et al. 2005. Weed Science
How many weed species are there?

- ~350,000 plant species
- ~3000 species used for food
- ~300 domesticated species
- ~15 staple food species

~350,000 plant species
What is a weed?

- A plant that is successful in colonizing disturbed, but potentially productive sites and at maintaining their abundance under conditions of repeated disturbances

Disturbance

- A discrete event that disrupts ecosystem, community or population structure
- Changes resources, substrate availability or the physical environment

Pickett and White, 1985
What are implications of this definition?

WHY do we have weeds?

- Propagules
- Disturbance
- Environment
- Chance
Questions, so far?
Weed Classification

- Habitat
- Phylogenetic Relationships
- Biology/Ecology
Weed Classification

✓ Habitat

→ Phylogenetic Relationships

Biology/Ecology
Questions, so far?
Phylogenetic Relationships

Phylo: race or tribe

Gen: “be born of”

**Phylogenetic**: the study of evolutionary relatedness among groups of organisms
Taxonomic Classifications of Weeds

Kingdom: *Plantae* - Plants
Subkingdom: *Tracheobionta* - Vascular plants
Supervision: *Spermatophyta* - Seed plants
Division: *Magnoliophyta* - Flowering plants
Class: *Liliopsida* - Monocotyledons
subclass: *Commelinidae*
Order: *Cyperales*
Family: *Poaceae* - Grass family
Genus: *Bromus* L. - brome
Species: *Bromus tectorum* L. - cheatgrass

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Order: *Cyperales*
Family: *Poaceae* - Grass family
Genus: *Bromus* L. - brome
Species: *Bromus arvensis* L. - field brome

Kingdom: *Plantae* - Plants
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Supervision: *Spermatophyta* - Seed plants
Division: *Magnoliophyta* - Flowering plants
Class: *Magnoliopsida* - Dicotyledons
Order: *Asteridae*
Family: *Asteraceae* - Aster family
Genus: *Centaurea* L. - knapweed
Species: *Centaurea stoeb L.* - spotted knapweed
Weed Classification

✓ Habitat
✓ Phylogenetic Relationships

→ Biology/Ecology
What makes a plant, a weed?

- Long seed life in the soil
- Quick emergence
- Rapid early growth
- No special environmental requirements for germination
- Ability to survive and prosper under disturbed conditions

Holm, 1978
Life Cycle

- Summer or winter annual
Annuals

Seed
Summer Annuals

Seed → Spring

Reproductive growth → Vegetative growth

Fall → Flower

Wild oat

http://www.forestryimages.org
Winter Annuals

- Seed
- Reproductive growth
- Flower
- Vegetative growth
- Splitting
- Yellow starthistle

Cheatgrass

Spring

Fall
Perennials

Seed

Reproductive growth

Vegetative growth

Flower

Spotted knapweed
“I don't recommend propagating this invasive weed but if the bees happen to get some honey off it, so be it”
Honey Bee Farmers Raise Concern Over Invasive Plant Control

Details
IPR program(s): IPR News Features
Date: February 2, 2011

Listen

Knapweed_Thistle.mp3

By Bob Allen

Last summer, researchers from Michigan State University released two foreign beetles on state forest land. The experiment is to see if the bugs will control an invasive plant called spotted knapweed that spreads wildly over old farm fields and alongside roads.
When does a plant become a weed?

• Biotic, abiotic
• Economic
• Cultural
  – *Dandelion*: human food
  – *Johnsongrass*: habitat for wildlife
  – *Russian olive*: firewood, shelter
When does a plant become a weed?

• Weeds may:
  – improve soil microbial activity
  – improve soil physical and chemical properties
  – reduce soil erosion and run-off
  – provide pollen or nectar for parasitoids and pollinators

Montana Noxious Weed Program

This program includes the Noxious Weed Trust Fund grant program, designed to assist counties, local communities, researchers, and educators in their efforts to solve a variety of weed problems in the state. The Noxious Weed Seed Free Forage certification program helps producers bring a value-added product to their operations and reduce the spread of noxious weeds. The Biological Control Program helps distribute biological control agents to Montana communities. Biological weed control is a long-term management method, but used in an Integrated Pest Management plan, weed control can be very successful.

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Weed Programs
- Noxious Weed Trust Fund
- Weed Seed Free Forage
- Aquatic Weeds Program
- Biological Controls

Noxious Weed List & Plans
- State Noxious Weeds List
- Aquatic Weeds Descriptions
- State Weed Plan
- Aquatic Invasive Plants Management Plan (PDF)
- Eurasian Watermilfoil EA (PDF)

Related Topics
- Weed Watchers Newsletter
- Weed Control Links
- Noxious Weed Seed Free Forage Producer List
- Grants & Research Summaries
- FY 08 & 09 Biennial Report - State Agency/County Weed District (Large PDF File)

Weed Related Acts
- EWM Quarantine (PDF)
- Noxious Weed Trust Fund Act and Rules
- Noxious Weed Seed Free Forage Act and Rules
- County Weed Act and Rules
Montana Noxious Weed List

• Defines 5 categories based on required management:
  – Priority 1A
  – Priority 1B
  – Priority 2A
  – Priority 2B
  – Priority 3

http://agr.mt.gov/weedpest/noxiousweeds.asp
Montana Noxious Weed List - Priority 1A

- These weeds are *not present in Montana*. Management criteria will require eradication if detected; education; and prevention.
  - Yellow starthistle (*Centaurea solstitialis*)
Montana Noxious Weed List - Priority 1B

- **Limited presence in Montana.** Management criteria will require eradication or containment and education.
  - Dyer’s woad (*Isatis tinctoria*)
  - Flowering rush (*Butomus umbellatus*)
  - Japanese knotweed complex (*Polygonum spp.*)
  - Purple loosestrife (*Lythrum spp.*)
  - Rush skeletonweed (*Chondrilla juncea*)
  - Eurasian watermilfoil (*Myriophyllum spicatum*)
  - Scotch broom (*Cytisus scoparius*)
  - Curlyleaf pondweed (*Potamogeton crispus*)
Montana Noxious Weed List - Priority 2A

- **Common in isolated areas of Montana.** Management criteria requires eradication or containment where less abundant. **Management shall be prioritized by local weed districts.**
  - Tansy ragwort (*Senecio jacobaea*)
  - Meadow hawkweed complex (*Hieracium spp.*)
  - Orange hawkweed (*Hieracium aurantiacum*)
  - Tall buttercup (*Ranunculus acris*)
  - Perennial pepperweed (*Lepidium latifolium*)
  - Yellowflag iris (*Iris pseudacorus*)
  - Blueweed (*Echium vulgare*)
  - Hoary alyssum (*Berteroa incana*)
Montana Noxious Weed List - Priority 2B

- **Abundant in Montana and widespread in many counties.** Management criteria will require eradication or containment where less abundant. **Management shall be prioritized by local weed districts.**
  - Canada thistle (*Cirsium arvense*)
  - Field bindweed (*Convolvulus arvensis*)
  - Leafy spurge (*Euphorbia esula*)
  - Whitetop (*Cardaria draba*)
  - Russian knapweed (*Centaurea repens*)
  - Spotted knapweed (*Centaurea stoebe or maculosa*)
  - Diffuse knapweed (*Centaurea diffusa*)
  - Dalmatian toadflax (*Linaria dalmatica*)
  - St. Johnswort (*Hypericum perforatum*)
  - Sulfur cinquefoil (*Potentilla recta*)
  - Common tansy (*Tanacetum vulgare*)
  - Oxeye daisy (*Chrysanthemum leucanthemum*)
  - Houndstongue (*Cynoglossum officinale*)
  - Yellow toadflax (*Linaria vulgaris*)
  - Saltcedar (*Tamarix spp.*)
Montana Noxious Weed List - Priority 3

- Regulated Plants: (NOT MONTANA LISTED NOXIOUS WEEDS). These regulated plants have the potential to have significant negative impacts. The plant may not be intentionally spread or sold other than as a contaminant in agricultural products. **The state recommends research, education and prevention to minimize the spread of the regulated plant.**
  - Cheatgrass (*Bromus tectorum*)
  - Hydrilla (*Hydrilla verticillata*)
  - Russian olive (*Elaeagnus angustifolia*)
Thank you!

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