Introduction to Weed Science and Weed Identification
Definition of a Weed

- A plant growing where it is not wanted (Oxford Dictionary)
- Any plant or vegetation, excluding fungi, interfering with the objectives or requirements of people (European Weed Science Society)
- A plant that is especially successful at colonizing and proliferating in disturbed sites
First Steps in Weed Management

• To effectively manage weeds you should know:
  – What weed you are dealing with – correct identification
  – Consider impact of the weed
  – Life cycle of the weed

• Weed biology influences methods and optimum time for management strategies
Weed Classification

- Morphology
  - Structure and form
- Life cycle
  - How it develops

Yellow foxtail

Ground ivy

Yellow nutsedge
Weed Classification – Morphology

- Monocotyledon – one cotyledon or one embryonic leaf
  - Grasses, sedges, rushes

- Dicotyledon - two cotyledons
  - “Broadleaf” plants
Weed Classification – Life Cycle

• Annuals
  – Complete their life cycle from seed to seed in less than 12 months

  *Velvetleaf*

[Images of Giant foxtail and Cocklebur]
Summer Annuals

- Seeds germinate in spring
- Flower in mid to late summer
- Produce seed in late summer or fall, then die
- Similar growing season to corn and soybean
- E.g., lambsquarters, foxtails, crabgrass, purslane, waterhemp
Winter Annuals

- Germinate in late summer or fall
- Dormant over winter
- Flower and produce seed in mid to late spring
- Die in summer
- E.g., shepherd’s purse, chickweed, pennycress, speedwells
Biennials

- Complete life cycle in **two** years
- Germinate and form basal rosette first year, remain vegetative and store food for winter

![Musk thistle](image1)

![Wild carrot](image2)

![Wild parsnip](image3)
Biennials

- Flower, produce seed, and die during second growing season
- Need undisturbed soil for at least two years
- E.g., musk thistle, wild carrot, wild parsnip, garlic mustard
Perennials (herbaceous)

• Live for more than two years
  – Simple: produce a taproot, spread only by seed
    • E.g., Dandelion, broadleaf plantain
  – Creeping: can reproduce by buds, rhizomes, tubers, bulbs, and seed
    • E.g., Quackgrass, nutsedge, leafy spurge
Weed ID - Sources of Information

- ISU Weed Identification Field Guide
- Reference books
- Extension bulletins
- Many websites
  - http://www.wssa.net/Weeds/ID/PhotoGallery.htm
  - http://plants.usda.gov/
- Someone “in the know”
  - Local experts
  - Extension offices
What Makes a Weed Successful?

- Seed characteristics
- Ability to germinate and grow in many environments
- Rapid seedling growth
- Self-compatibility or easy cross-pollination
- Vigorous vegetative reproduction
- Ability to tolerate environmental stresses
Seed Characteristics

- Longevity of seed
- Long period of seed production
- High seed output
- Ability to produce seed in adverse conditions
- Long and short seed dispersal

Giant ragweed

Lambsquarters
Vegetative Reproduction

• Rhizomes
  – Underground structures that produce new plants
    • E.g., canada thistle, quackgrass

• Stolons
  – Above-ground creeping stems that root at nodes and produce new plants
    • E.g., ground ivy (creeping charlie)
Vegetative Reproduction

- Bulbs, bulblets, tubers
  - Underground leaf tissue modified for food storage. Produces new plants
    - E.g., wild garlic, yellow nutsedge
  - Aerial bulblets (above ground)
    - E.g., wild onion, wild garlic
Vegetative Reproduction

• Plant reproduction
  – Each plant part can regenerate another plant
  – When cultivating, the implement can redistribute them in the field
• E.g., Asiatic dayflower, purslane
Dispersal

- Wind
- Attachment – burs, thorns, stickers
- Birds – digestion/excretion
- Artificial dispersal – “human dispersal”
  - Soil and compost
  - Equipment
  - Plants
  - Contaminated seed
Weed Management Strategies

Canada thistle

Velvetleaf

Poison ivy

Yellow nutsedge
Summary

• Identify the weed
• Know the life cycle
• Use control strategies based on weed species, life cycle, crop, field or landscape situation, and the environment