College of Agricultural, Consumer and Environmental Sciences

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New Mexico State University
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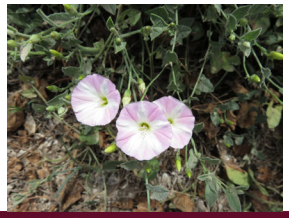
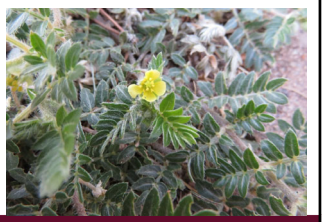
Urban Weeds – Management and Identification

About the College: The College of Agricultural, Consumer and Environmental Sciences is an engine for economic and community development in New Mexico, improving the lives of New Mexicans through academic, research, and extension programs.

1

Successful Weed Control

- How do I achieve successful control?
  - Early bird catches the worm…or in this case, the weed!
    - The younger the plant the 'easier' the control
    - Young plants haven't developed structures that make weed development and growth successful
      - Seed development
  - Management decisions should be based on biology of target weeds!
    - Annual vs. perennial
    - Reasons for success
    - Periods of active growth
  - Identification is KEY!
  - IPM = Success!

2

Integrated weed management (IWM)

- Multiple control options available
  - No single weed control option will be successful!
- Combinations of good management practices are required for effective control
  - Prevention + mechanical + cultural + herbicides = weed biology (timing)
- Strategies should be specific to target weed
  - **Accurate identification to target weed biology**

3

Why are the weeds there?

- Indicator weeds – weeds whose presence in an environment can often indicate an underlying management problem
- Often different management can be suggested to help desirable plants outcompete weeds
  - Won't control weeds outright, useful tool
  - Management depends on the desirable plant

4

5

Weed Management Tools

- How do I manage weeds?
  - Prevention
    - Plant certified seed, clean equipment, weed control prior to seed production
  - Mechanical/Physical
    - Tillage, hoeing, hand pulling, mowing, mulching, weed blankets, etc.
  - Cultural
    - Reduce weeds by managing desired plants
      - Irrigation, fertilization, mowing (benefit of lawn), planting timing
  - Biological
    - Insects or fungi that work negatively on weed
  - Chemical
    - The label is LAW!
    - Effective means of control when used according to the label
      - Resistance
      - Offsite damage

6

Things to consider with Herbicides

- Chemicals used to kill or suppress unwanted vegetation
  - Can be synthetic or organic
- Primary method of weed control in multiple cropping systems
  - Inexpensive (can help reduce production costs)
  - Greater flexibility in timing of weed control
  - Results are often quick and may offer extended control
- Helpful tool
  - Herbicides alone will not eradicate weeds (IPM)
- Success is always dependent on…
  - Accurate identification of weed and desirable plant
  - Applications in accordance with the label
  - Consideration of other desirable plants in your area
    - Trees, shrubs, ornamental plants, gardens, greenhouses, etc.

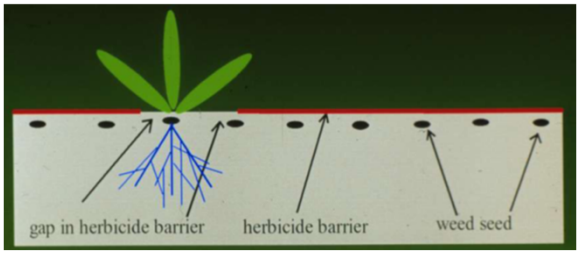
7

Timing of application

- Preemergence (PRE)
  - Applied before the weed emerges from soil
  - Can be applied either before or after desired crop
    - Read the label
  - **Requires incorporation** into the soil
    - Irrigation, shallow tillage
- Postemergence (POST)
  - Applied after weeds have emerged
  - **Allow to dry**, no soil incorporation

8

Preemergence herbicides (PRE)



PRE herbicides do not prevent the weed seed from germinating, they control weeds as they grow through the herbicide treated zone.

9

Postemergence (POST) weed control

- Treat only areas infested with weeds
  - POST – IWM approach
  - PRE – blanket application
- Used to control weeds that have already germinated
  - At this point most PRE herbicides are useless

10

Postemergence (POST) weed control

- Sprays give better control than granules
- Avoid extreme temperatures. Apply when temperatures are between 40 and 85ºF and sunny
- Typically need a rain free period of at least 6 hours
- Do not apply to stressed desirable plants
  - Also stressed weeds
- Check the label for instructions on replanting/reseeding application areas
- Multiple active ingredients available for use
  - Dependent on cropping system, site objectives, and accurate weed identification

11

Other POST options

Weed Control for the Garden and Landscape Extension Publication
Purdue University

B. Post-emergence, Selective Herbicides *

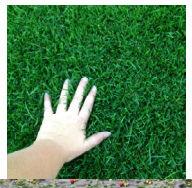
- Applied after weeds are already up and growing.
- They can present a problem by drifting onto non-target plants.
- Examples for broad-leaved weed control, particularly in lawn and in brushkillers:
  - 2, 4-D (sold under many brand names)
  - MCPP (sold under many brand names)
  - dicamba (Banvel and many others)
  - combination formulas (Trimec)
- Examples for grass weed control:
  - fluazifop-butyl (Grass-B-Gon, Fusilade)
  - sethoxydim (Poast)
- Uses may include lawn, tree, shrub, and flower beds, and some fruit crops -- read the label!

***Be careful of using these active ingredients near desirable vegetation and food gardens!**

READ THE LABEL!!!

12

Organic Weed Control



- Early detection (scouting)
- Dense vegetation, mulching, etc.
- Mechanical/physical removal
- Soil solarization
- Weed seed germination

13

Organic Herbicides

- Generally, fall under 7 product categories
  - Natural acids
    - Vinegar (acetic acid), citric acids, pelargonic acids
  - Phytotoxic oils
    - *d*-limonene, clove oil, rosemary oil
  - Corn gluten meal
    - Preemergent
  - Herbicidal soaps
    - Ammoniated soap of fatty acids
  - Salt-based herbicides
    - Potassium or ammonium salts of fatty acids (aka soap salts)
  - Iron-based herbicides
    - Iron HEDTA
  - Combination products

14

15

16

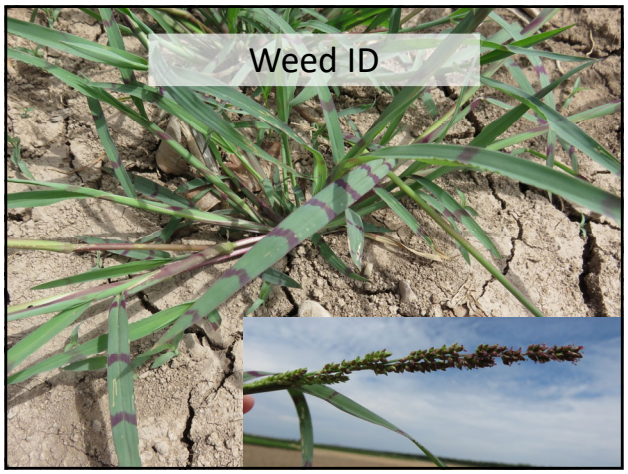
17

18

Organic Herbicides

- Things to consider
  - You are still applying an herbicide
    - Must have a viable label with directions for safe and effective application
    - Do NOT use DIY mixtures as herbicides
  - Generally considered to be contact herbicides
    - Injure the plant by burning plant cuticle or disrupting cell walls (plants lose too much water and die)
    - Chelated iron products are taken up by the plant
  - Non-selective
  - Not as effective as synthetic counterparts
    - Can be effective, but must be combined with other IPM practices
  - Expensive

19



20

Why identify?

- Annuals vs. Perennials
  - Pre vs. Post control options vary
- Variation in response to management
  - Select the right tool for success
- Life cycle, flowering, seed production
  - Timing of management is essential
  - Look for features of maturity
    - Size does not equate to maturity with weeds

21

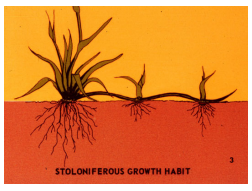
Why are weeds successful?

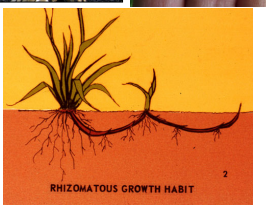
- Rapid colonization of disturbed areas
- Very rapid growth
- Self compatible
- Very high seed production
- Seed dormancy
- Vegetative reproductive structures
- Seed dispersal mechanisms

22

Vegetative Reproductive Structures

- Bulbs/tubers
- Tillers
- Creeping stems
  - Rhizomes
  - Stolons

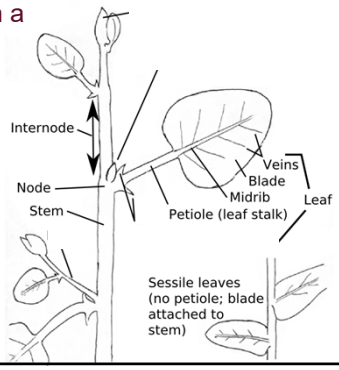




23

Broadleaf identification:

- Key structures on a broadleaf weed
  - Node
  - Internode
  - Leaf stems
    - Petiole
    - Sessile
  - Leaf features
    - Shape
    - Veins
    - Edges (margin)



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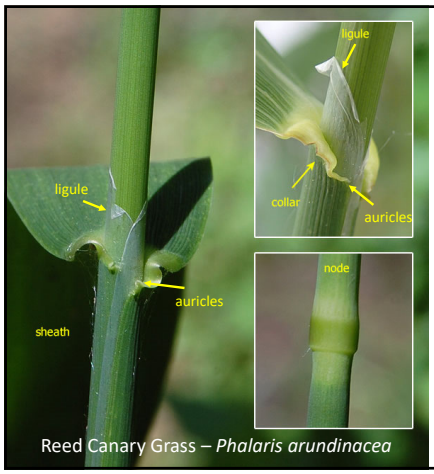
24



Grass ID:

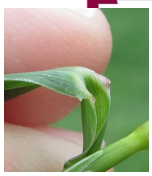
Collar

25

Grass identification: Ligule

- Collar
  - Found at junction between leaf blade and stem sheath
    - Essential ID characteristic
      - Absence of seedhead
  - Ligule (found at the back of the collar)
    - Membranous
    - Hairy
    - Absent


Zoysiagrass


Barnyardgrass


Cheatgrass

26

Weed ID is essential for effective management

27

Weeds are categorized into three life cycles

1. **Annuals** – lifecycle lasts for one growing season, germinates from seed only
   - Summer annuals
     - Germinate in the spring when soil temperatures reach about 55-65° F, flower in the summer and die in the fall at first frost
   - Winter annuals
     - Germinate in the fall (55-65° F), grow until spring and die during late spring or early summer
2. **Biennials**
   - Life cycle lasts two years, germinate from seed only. Few examples
3. **Perennials**
   - Capable of living more than two years, can survive from one season to the next by vegetative reproductive structures (roots, tubers, rhizomes, stolons, etc.)

28

Weed lifecycle and optimum control timings

- Winter annuals
  - Sept. – Nov. optimum control window
  - Target weeds when they are young
  - Should I apply an herbicide in the spring?
- Summer annuals
  - May – June optimum control window
  - Target weeds when they are young
- Biennials
  - During first growing season (rosette stage) optimum timing for control
  - The longer it grows, the more difficult the control
  - Once plants bolt, herbicides will not work
- Perennials
  - Fall management works best!
    - Late Sept. through mid. Nov. is best
    - Second best timing is mid-March through May
  - Target all management practices during active growth

29

Summer annuals include:

- Kochia
- Puncture vine
- Prostrate spurge

30

Kochia (*Kochia scoparia*)

- Identifying features:

Leaves long, narrow

No leaf stems (petioles)

Dull green in color

Covered in soft, fine hairs

Seeds in clusters

Can produce 14,600 seeds per plant

Becomes tumbleweed when mature

31

Puncture vine (Tribulus terrestris)

- Identifying features:

Prostrate, mat-forming growth habit

Leaves pinnately divided into 4-8 pairs of leaflets per stem

Leaves and stems are covered in hairs

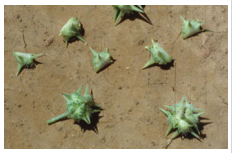
Leaf stems arranged in a zig-zag pattern on main stem

Stems can be brown or reddish in color

Yellow, butter-cup like flowers

Produces strong, tack-like fruits (goatheads)

Leaves toxic to livestock



32

Prostrate spurge (*Euphorbia maculate*)

- Identifying features:

Mat-forming

Oval-shaped leaves

Opposite orientation on stem

Maroon splotch on upper surface

Stem exudes milky sap when broken

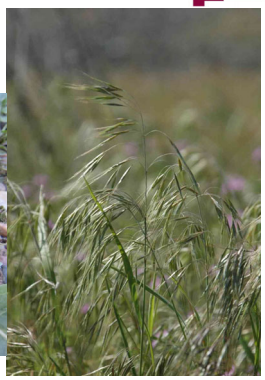
Small cluster of flowers

Produces viable seed within weeks of germination

33

Winter annuals include:

- Cheatgrass
- London rocket



34

London Rocket (*Sisymbrium irio*)

- Winter annual:

Young plants are a basal rosette

Smooth, spear-shaped leaves that are deeply lobed

Mature leaves can be spade-shaped

Upright flowering stems develop at maturity

Small clusters of pale yellow flowers

Fruits are long, thin tubular seed pods

35

Cheatgrass (*Bromus techtorum*)

- Identifying features:

Aka: downy brome

All leaves and stems covered in soft, dense hair

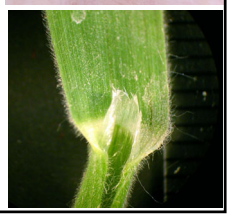
Papery thin, ragged edged ligule

Inflorescence is dense, slender, and usually drooping

Can produce 300 seed per plant or more

Seed has awns that can be 3/8 to 5/8'' long

Awns can turn purplish at maturity



36

Perennial weeds include:

- Dandelion
- Field bindweed
- Bermudagrass

37

Dandelion (*Taraxacum officinale*)

- Identifying features:

Deeply toothed leaf margins

Older teeth point towards leaf base

Milky sap

Long, fleshy taproot

Bright yellow flowers on long stalks

White puff-ball seedhead

38

Field bindweed (*Convolvulus arvensis*)

- Identifying features:

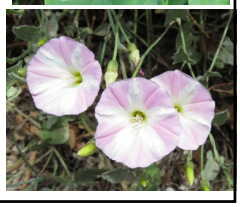
Slender climbing viney growth

Spreads by rhizomes

Smooth stems grow along ground or climb vegetation/objects

Arrow-head shaped leaves

Funnel shaped flowers (white to pink)



39

Bermudagrass (*Cynodon dactylon*)

- Identifying features:

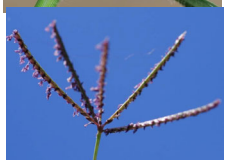
Seedlings are hairless

Older plants may develop hairs on blade or sheath

Hairy ligules

Finger-like seedhead

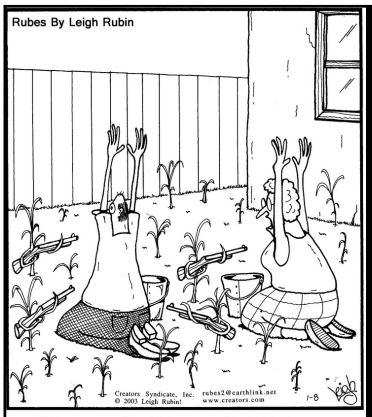
Spreads by rhizomes and stolons



40

Don't be afraid to ask for help

41



"We never should have waited this long ... Now the weeds have *completely* taken over."

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42