Pesticide Safety Education Program
General Weed Information

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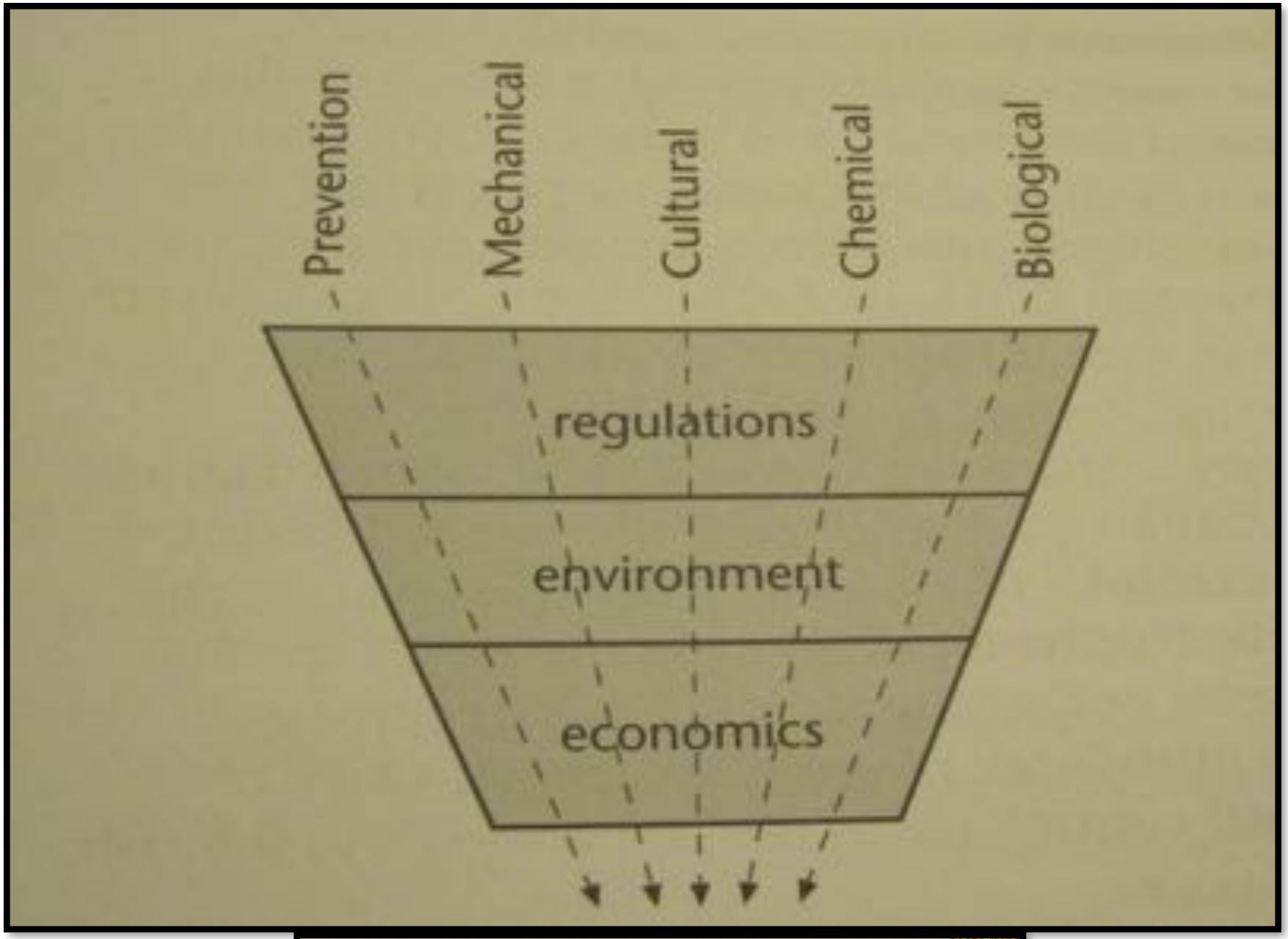


Integrated Weed Management (IWM)

* Native Weeds
* Introduced Weeds
* Escaped Plants

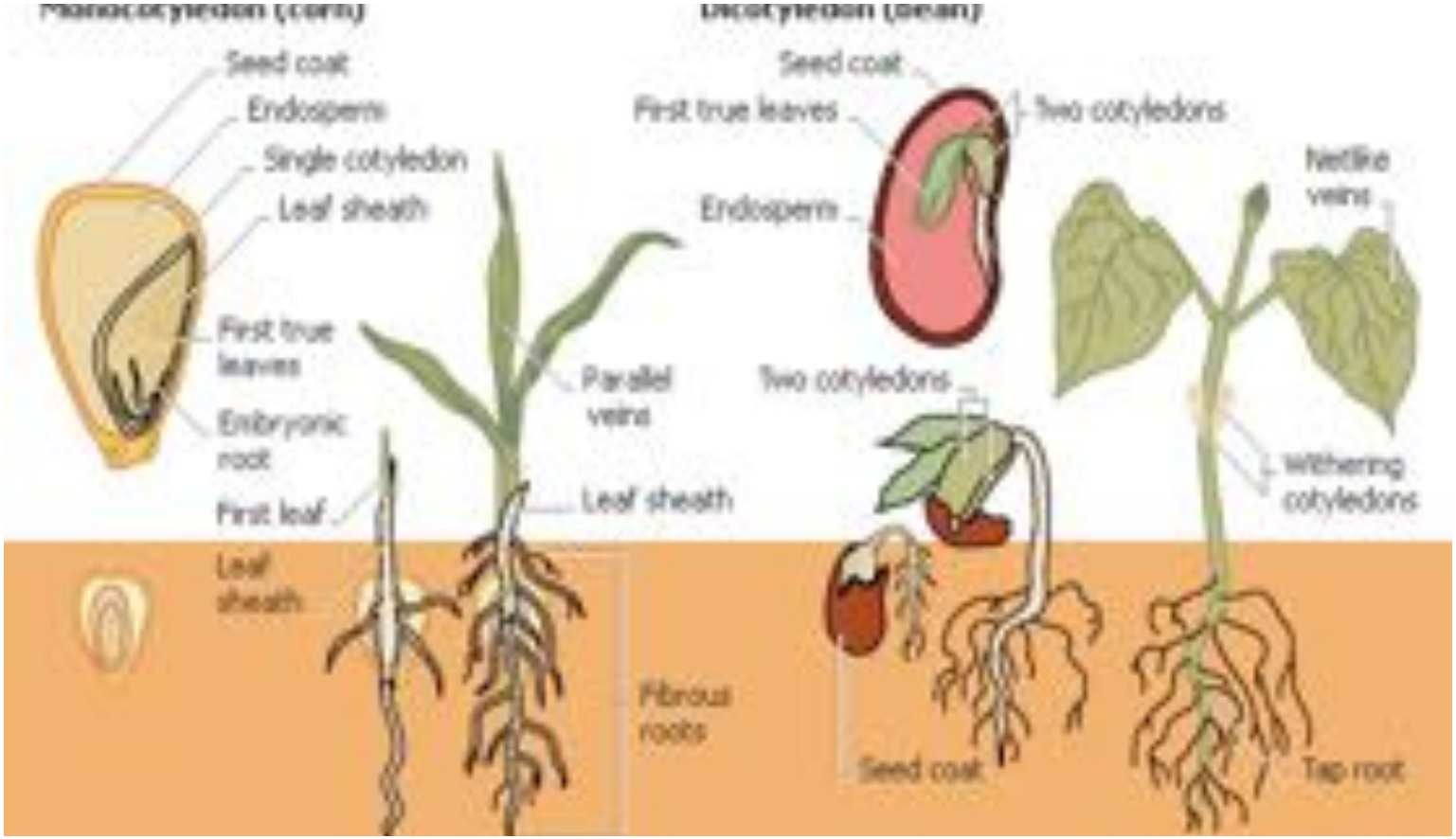
* Origin of Weeds

* Wind
* Water
* Mammals, birds, and humans

* How Weeds Spread

* Monocotyledons (grasses and sedges)
* Dicotyledons (broadleaf plants, shrubs, and trees)
* Annual Plants
* Biennial Plants
* Perennial Plants
  * Simple perennial
  * Creeping perennial

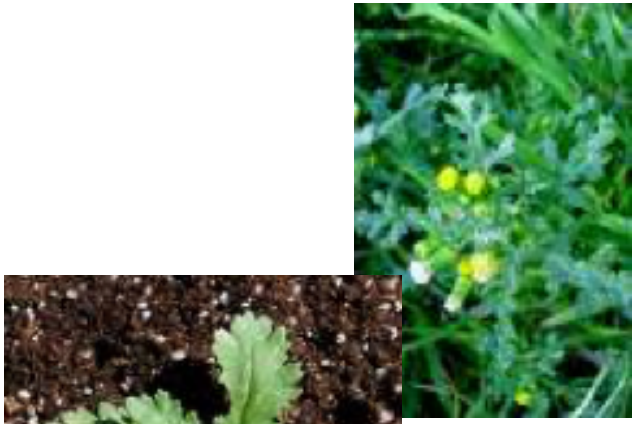
* Weed Classification & Life Cycles



* Two major plant groups:
  Grass (monocotyledon
  Broadleaf (dicotyledon)


Annuals

*Hemp Nettle



*Common Groundsel

*Corn Spurry

*Lambs Quarter

*Narrowleaf Hawksbeard

*Pineapple Weed

*Shepherd Purse

*Wild Buckwheat


*Biennials

*White Sweet Clover

*Yellow Sweet Clover


Perennials

*Bird vetch

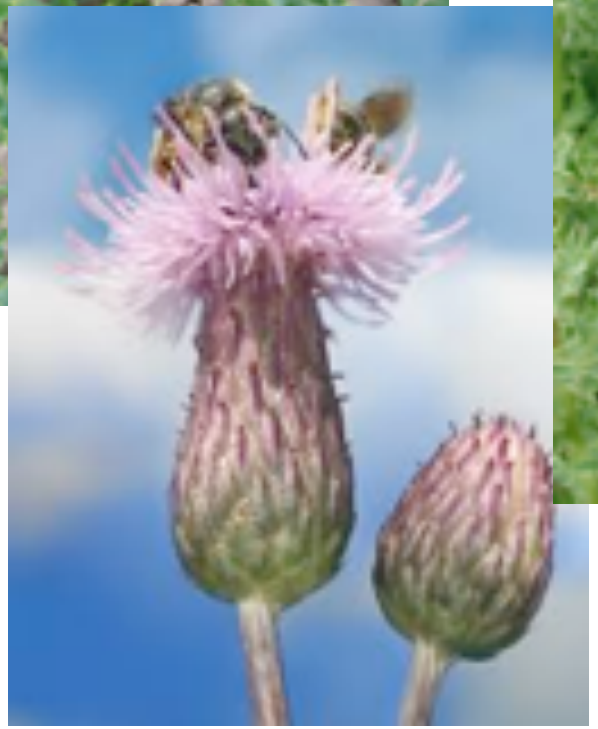
*Bird Vetch

*Dandelion

*Narrow Leaved Hawkweed

*Yarrow

*Foxtail



*Creeping Thistle (Canada)

*Perennial Sowthistle

*Sowthistle in barley

*Yellow Toadflax

*Yellow Toadflax

*Quack grass in barley

*Horsetail

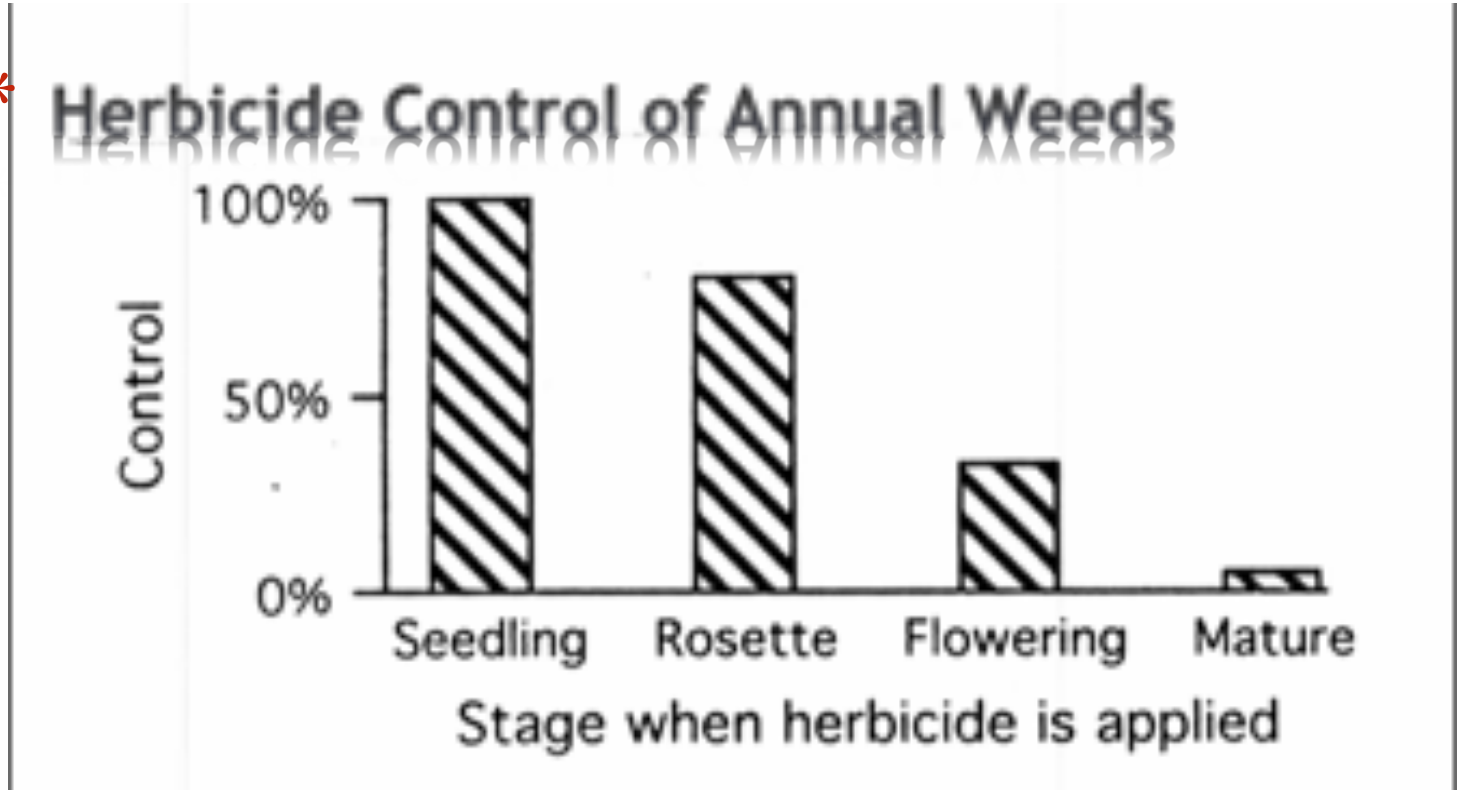
Factors for Effective Applications

- Identify the pest correctly
- Select the appropriate product
- Calibrate equipment properly
- Measure the pesticide accurately
- Review the treatment site before and during application
- Monitor the results

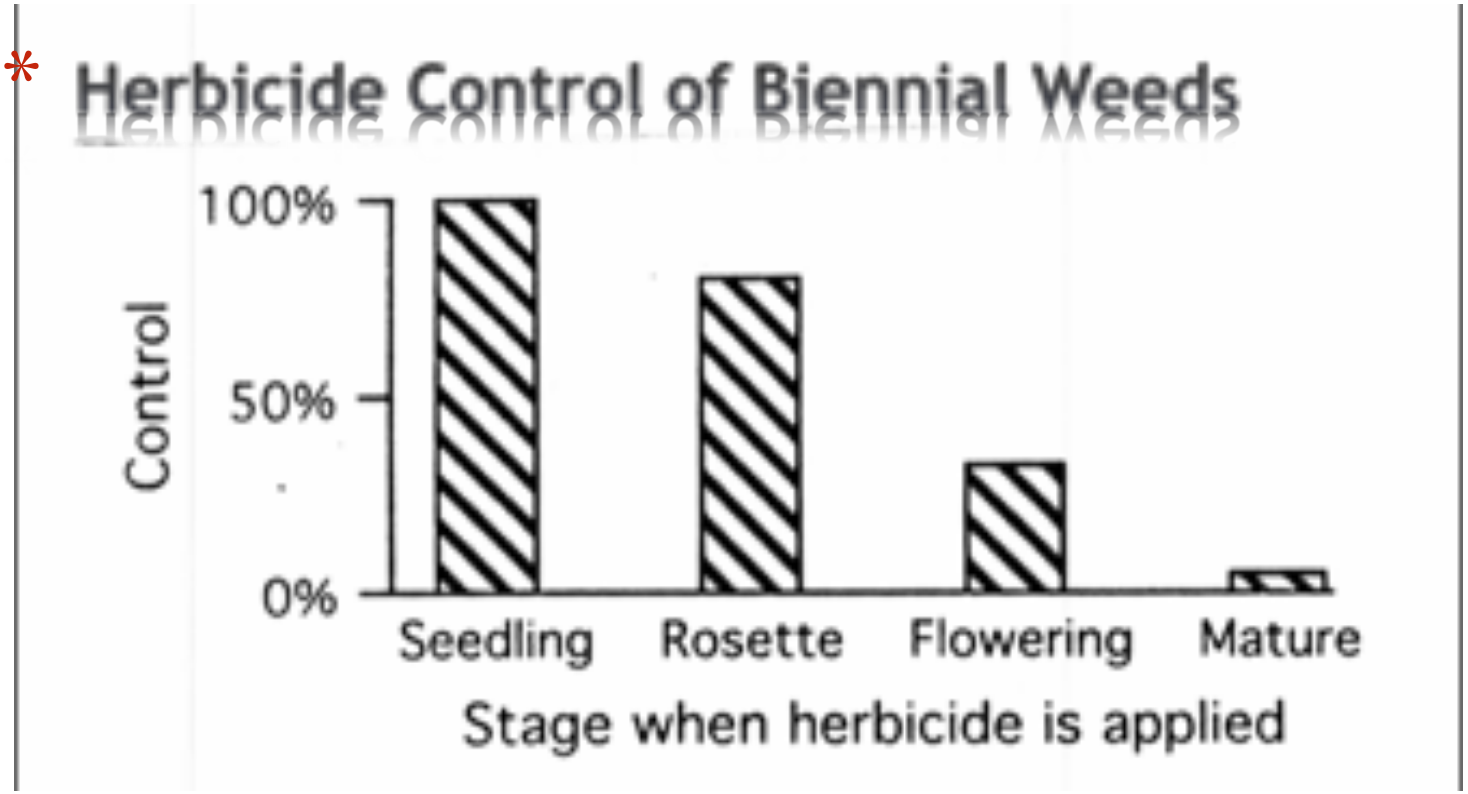
Application Timing

- In general, plants are most susceptible to postemergence herbicides:
  - As seedlings when rapid growth takes place
  - In perennials, when a period of rapid growth has ended and energy reserves are reduced and need replacing

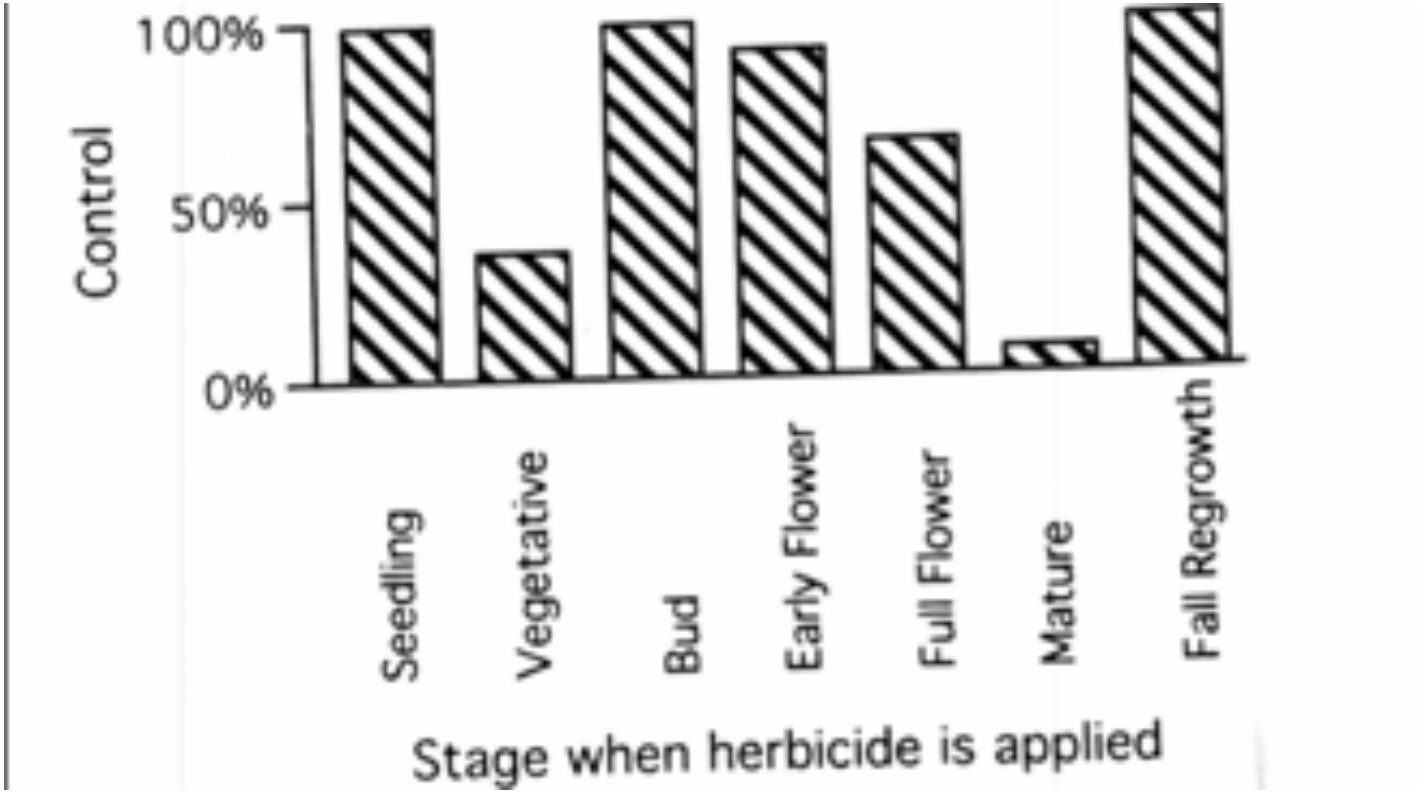
* Herbicide Control of Annual Weeds



* For best results with tillage or postemergence herbicides, control seedlings as soon as possible after emergence because they are easiest to kill at this stage.

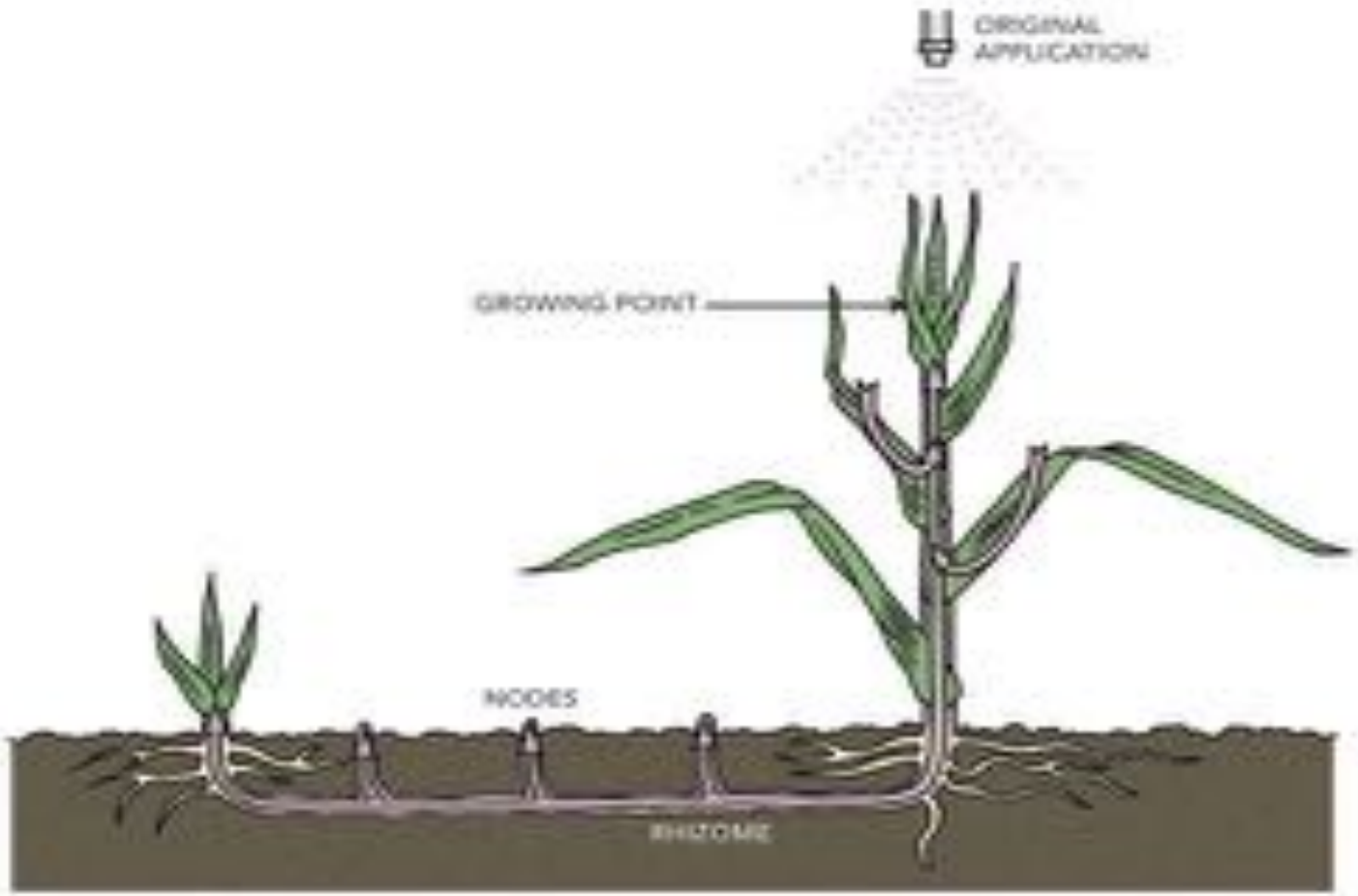
* 
Herbicide Control of Biennial Weeds
100%
50%
0%
Control
Seedling
Rosette
Flowering
Mature
Stage when herbicide is applied

* Herbicide Control of Perennial Weeds



* To obtain the best herbicide control established perennial broadleaf weeds, treat perennials at the bud and fall regrowth stages with 2,4-D or similarly translocated herbicides.

Contact herbicides do not move within the plant; they affect only the plant tissues they contact.



* Translocated (systemic)herbicides move to the leaf and stem tips or move upward or downward in the plant within the conductive tissues.

* Plants need to be actively growing for the herbicide to upset or stop certain plant processes.
* Best temps to kill weeds are between 65 and 85 degrees
* Minimum temps in mid 50's degree Fahrenheit
* Under cool cloudy conditions non-target plants may show damage
* Sprayed weeds should not be disturbed (cultivation or mowing) for two weeks

* Herbicide Uptake

* **Growth Regulators:** Group 4

Chemical family	*Examples*
Phennoxy acetic acids	2,4-D, MCPA
Benzoic acids	Banvel
Pyridines	Stinger, Tordon, Garlon

* **Amino Acid Synthesis Inhibitors:** Group 2

Chemical family	*Examples*
Sulfonylureas	Glean, Harmony Extra, Accent, Express, Oust
Imidazolinones	Assert, Pursuit Arsenal
Amino acid derivatives	Roundup, Touchdown

* Modes of Herbicide Action

Modes of Herbicide Action

* **Lipid Inhibitors:** Group 1

Chemical family	*Examples*
Cyclohexanediones	Select, Poast
Aryloxyphenoxypropionates	Hoelon, Fusilade

* **Seedling Growth Inhibitors:** Group 3

Chemical family	*Examples*
Dinitroanilines	Treflan, Prowl, Balan, Surflan
Acetanilides	Lasso, Dual
Thiocarbamates	Eptam, Eradicane, Far-Go, Sutan

* **Photosynthesis Inhibitors:**

Group 5 and 6

Chemical family	*Examples*
Triazines	Bladex, Princep, Lexone, Sencor, Aatrex
Phenylureas	Spike, Lorox, Karmex
Uracils	Sinbar, Hyvar
Benzothiadiazoles	Basagran
Nitriles	Buctril

* Modes of Herbicide Action

* **Cell Membrane Distrupters:** Group 22

Chemical family	*Examples*
Bipyridyliums	Gramoxone Extra, Diquat
Biphenyl ethers	Blazer, Goal

* **Pigment Inhibitors:** Group

Chemical family	*Examples*
Isoxazolidinones	Command
Pyridazinones	Solicam, Evital
Triazoles	Amitrol

* Modes of Herbicide Action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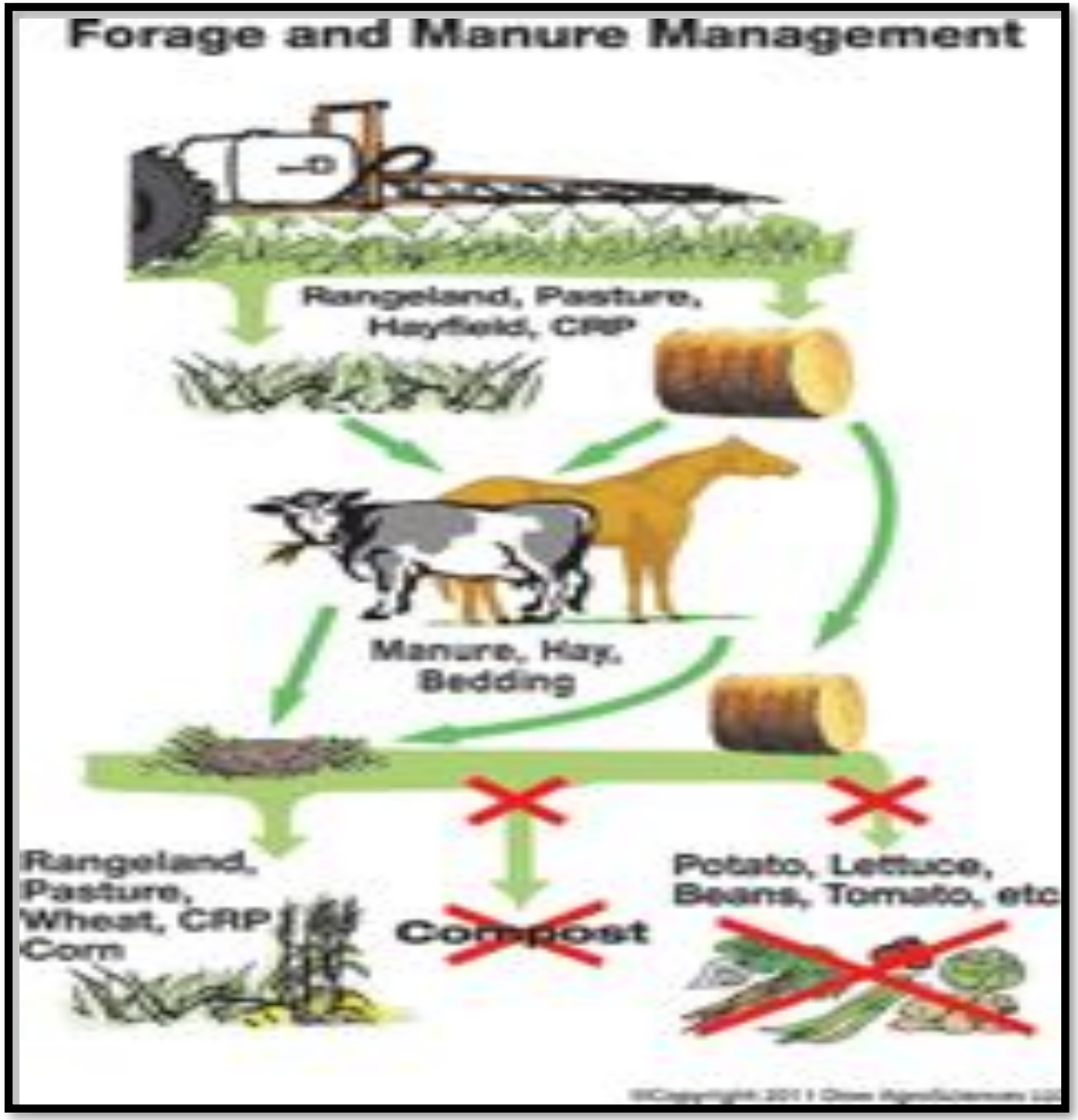


*Aminopyralid Stewardship

*4 Fluid ounces vs. 4-Ounces Dry Weight

* Fluid and dry ounces are NOT interchangeable equivalents.
* Different substances vary in density (mass per unit volume).
  * Ex: 4 dry oz of coffee creamer takes up more space than 4 dry oz of talc
  * Ex: 4 dry oz of different DF/WDG products (and product "batches") vary in volume
* Be sure you know what you're measuring—and use the right method and device!!

* Take-Home Messages

Effects of sprayer pressure on delivery rate

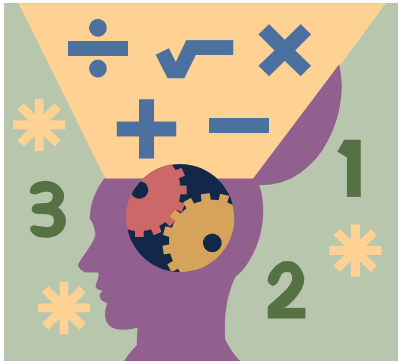
(speed constant)

Sprayer pressure (psi)	Sprayer delivery rate (gal/acre)
10	10
40	20
160	40

Effect of sprayer speed on delivery rate (constant pressure)

Sprayer speed MPH	Sprayer delivery rate (Gal/acre)
1	40.0
2	20.0
3	13.3
4	10.0

* You do the math



Let's say you have an 800-gallon tank

* If you apply 10 gallons of water per acre, how many acres will the tank cover?

If you apply 20 gallons of water per acre, how many acres will it cover?

If you apply 15 gallons of water per acre, how many acres will it cover?

Always write down your math to double-check your calculations

*Frilled and end cut tree

* The approximate number of hours required between herbicide application and rainfall (rainfastness) for some commonly used natural area herbicides.

Herbicide	Rainfast (hours)
2,4-D Amine	1-6 (depends on formulation)
Aminopyralid (Milestone®)	2
Aminopyralid + metsulfuron (Opensight®)	4
Clopyralid (Transline®)	2-4
Glyphosate (Roundup®)	3-6 (depends on formulation)
Pidoram (Tordon® 22K)	2
Triclopyr (Garlon® 3A; Garlon 4 Ultra)	1-3 (depends on the formulation)

*Flaming Weeds

*Finger Print

*Blasting Weeds

Spray Safe!

Thank You