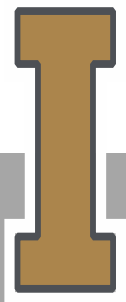


HAY QUALITY AND GRASSY WEED MANAGEMENT

Current Topics in Farm and Forest Health

December 14, 2017

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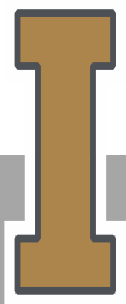


HAYFIELD FERTILITY

- Better results begin with good information.
- Most important information is current soil condition.
- A proper soil test will provide the best parameters of current soil condition.
- Sampling tools, soil bags, and submission forms available a county Extension office.



TEST YOUR SOIL!



WHAT INFORMATION DOES A SOIL TEST PROVIDE?

- **Soil Organic Matter**
- **pH and salts**
- **Soil nutrient content**
- **Other information such as soil texture or fertilizer recommendations**

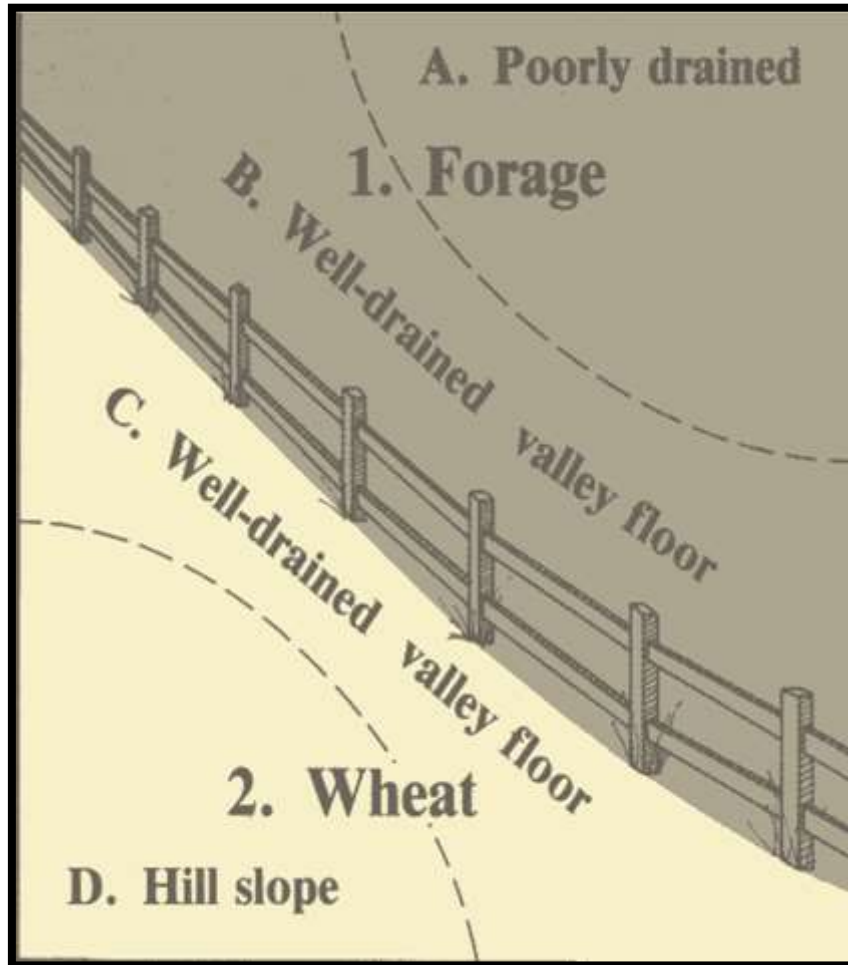


HOW OFTEN SHOULD I TAKE A SOIL SAMPLE?

- **Prior to seeding a crop in new ground**
- **At least every three years for established perennial crops**
- **Frequently enough to make good decisions on fertilization**



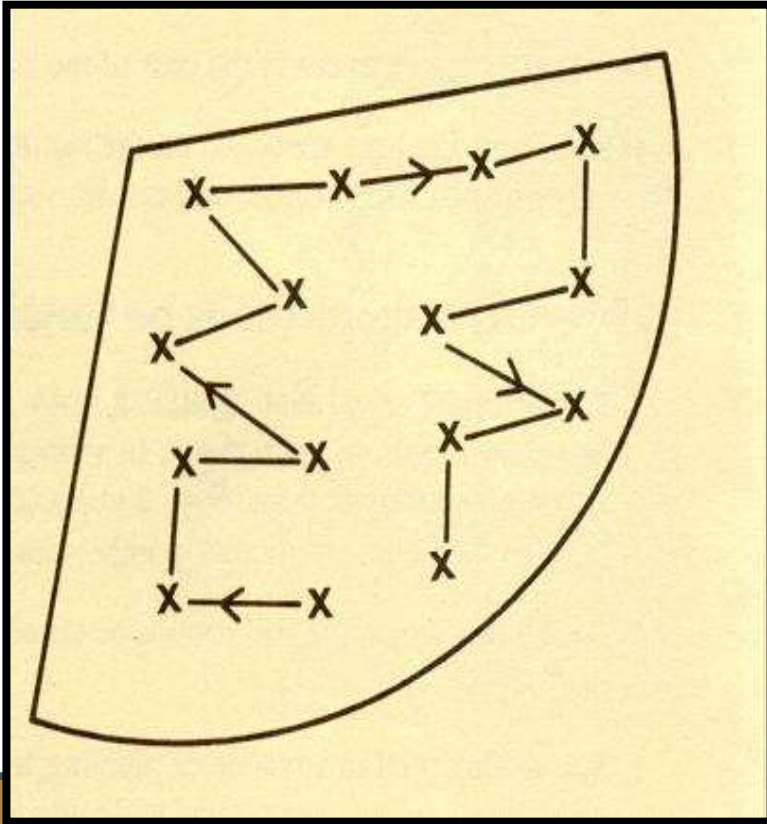
HOW TO TAKE A SAMPLE



First select the site. Your soil sample should represent only one soil type or soil condition.



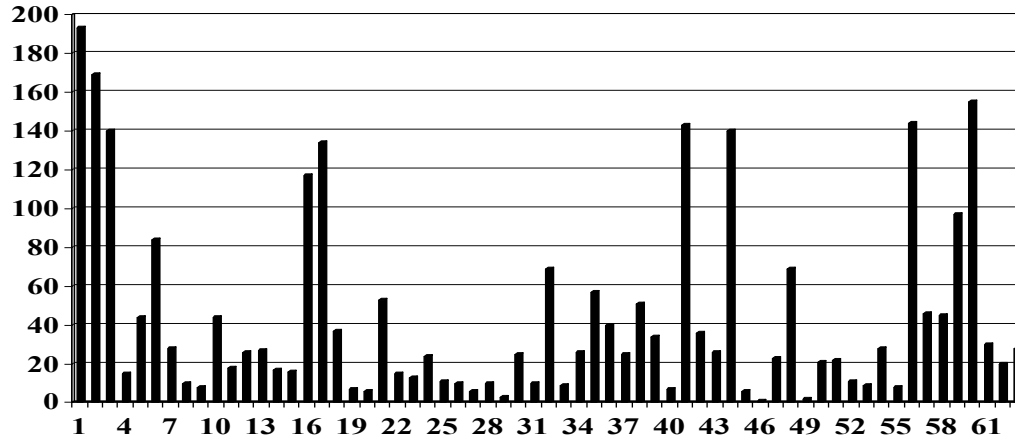
HOW TO TAKE A SAMPLE



Each sample should consist of sub-samples taken from about 15 locations within the same soil type or sampling area.

SOIL CORE VARIABILITY

Soil test P (Bray-I, lbs./acre)

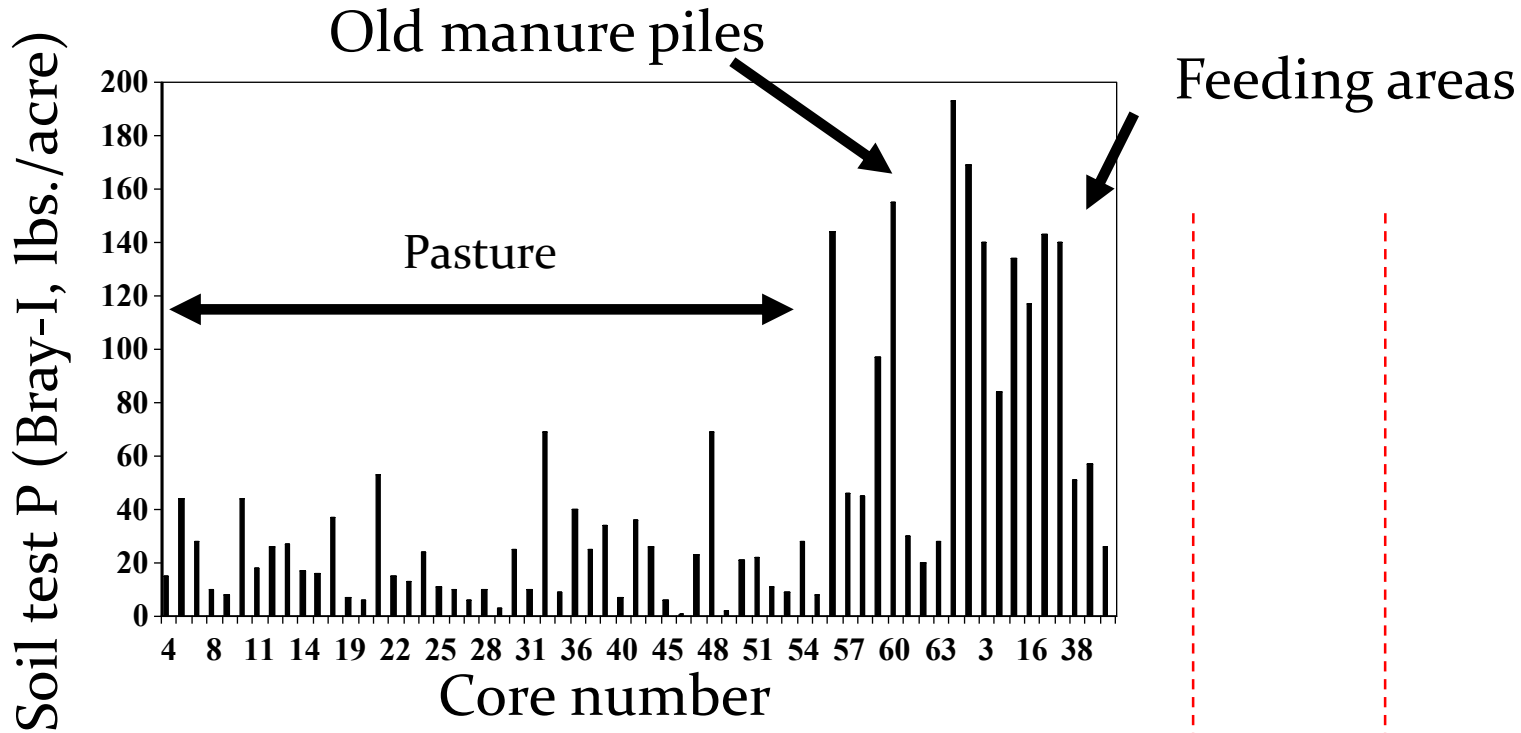


Mean: 44 STD: 48

Core number



INCREASING ACCURACY BY DIVIDING FIELDS BASED ON KNOWN VARIABILITY



Overall Mean: 44, STD: 48

Pasture mean: 20, STD: 17

Feeding area mean: 114, STD: 52

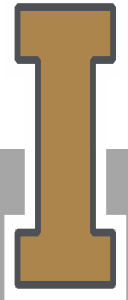


HOW TO TAKE A SAMPLE



Use the “slice” method for a representative sample.

A soil probe is a good tool for collecting samples.



SOIL TEST RESULTS

- What do my soil test results mean?
- What nutrients do plants need?
- How can I supply those nutrients?



SOIL ORGANIC MATTER (OM)

Living or dead plant
and animal residue

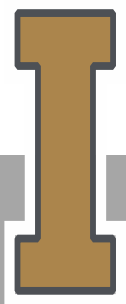
Measured in percent

OM content is
highly variable

Generally, 3% to 8%
OM content is good
for plants



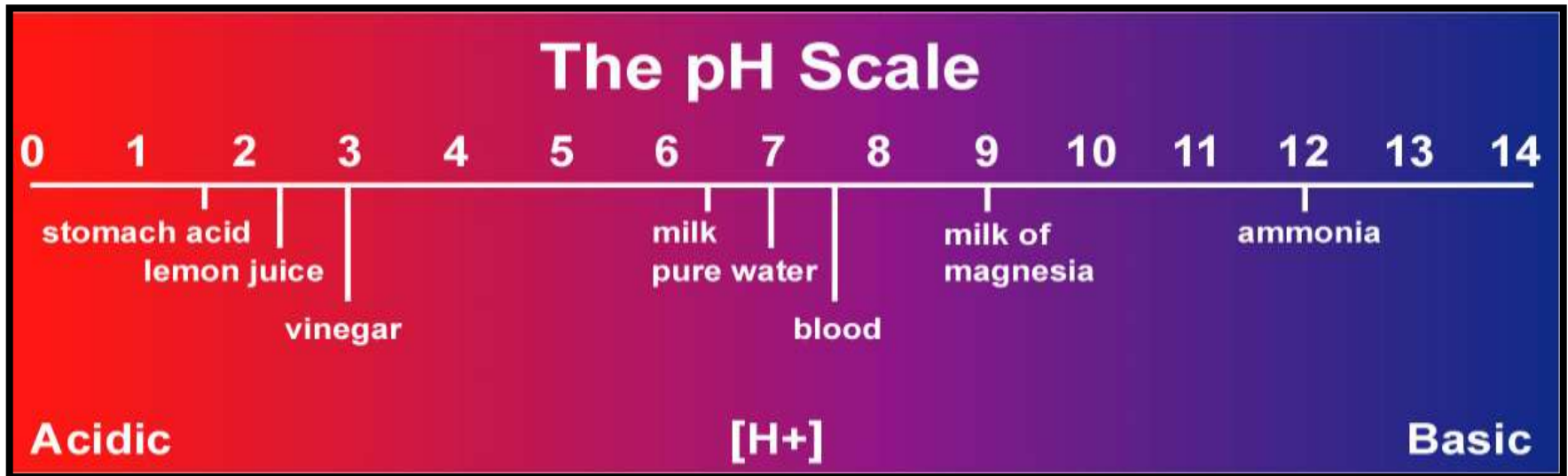
UNCE, Reno, NV



PH

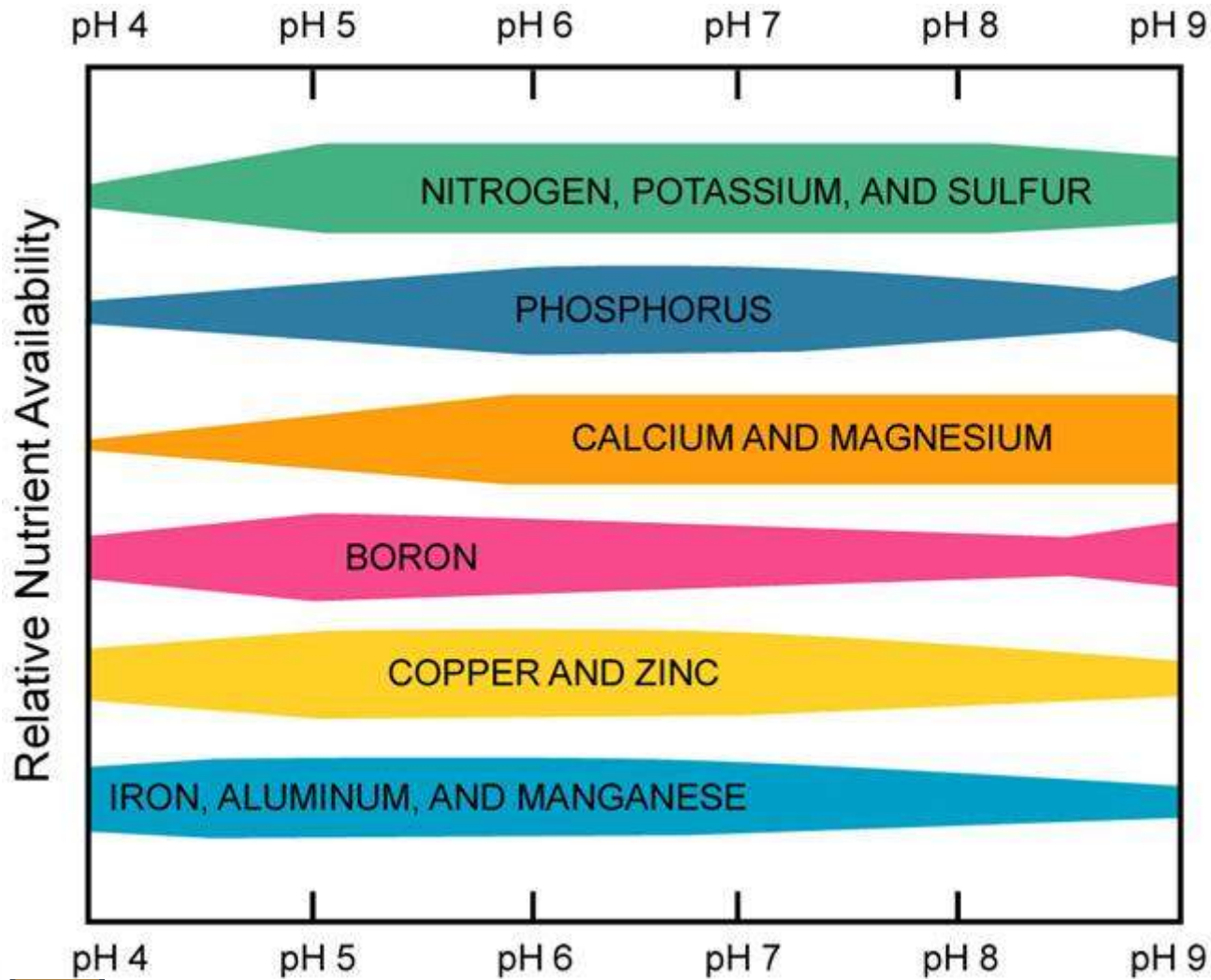
Indicates relative acidity or alkalinity

pH 7 = neutral; less than 7 = acid; more than 7 = alkaline or basic



Adapted from library.thinkquest.org

University of Idaho
Extension



SOIL PH AND NUTRIEN TS

Widest part of the bar indicates maximum availability

Adapted from www.soil.ncsu.edu

NUTRIENT MANAGEMENT GOALS

- **Meet crop nutrient needs**
- **Maintain soil quality**
- **Conserve resources**
- **Protect water quality -- reduce leaching and runoff risk**



MACRONUTRIENTS

N = nitrogen

P = phosphorus

K = potassium

Ca = calcium

Mg = magnesium

S = sulfur



MICRONUTRIENTS

Fe = iron

Mn = manganese

Zn = zinc

B = boron

Mb = molybdenum

Ni = nickel

Cu = copper

Co = cobalt

Cl = chlorine



QUESTIONS TO ASK YOURSELF BEFORE YOU ADD FERTILIZER:

1. Which elements do I need? (N, P, K, S, Ca)
2. How much do I apply?
3. What type of material do I use?
4. Which application method is best?
5. When is the best time to apply it?



TYPES OF FERTILIZERS

- Chemical fertilizers
- Organic fertilizers (bone meal, compost, manure, etc.)



PRIMARILY HAY OR GRAZING?

Nutrient	Dry Matter Concentration	Removal per ton of hay
Nitrogen	2.0 % N	40 lb N
Potassium	3.0 % K ₂ O	60 lb K ₂ O
Phosphate	0.65 % P ₂ O ₅	13 lb P ₂ O ₅
Sulfur	0.25 % S	5 lb S

- In grazed pastures, 85 to 90% of nutrients returned in manure and urine.
- Uneven distribution of nutrients in grazed pastures.
- Test hay fields annually, pastures every 3 years.



NITROGEN FOR GRASS AND GRASS-LEGUME MIXES

Stand Composition	YIELD POTENTIAL			
	1-2 tons/acre	2-4 tons/acre	4-6 tons/acre	6-8 tons/acre
	-----	Nitrogen recomm	endation (lbs/ac)	-----
100% grass	50	75	100-150	150-200
75% grass, 25% legume	25	50	75-100	100-150
50% grass, 50% legume	0	25	50	75
25% grass, 75% legume	0	0	25	50



HAYFIELD WEED MANAGEMENT



BE A GRASS FARMER FIRST!

Grass management is more fun than weed management.



WHY A PROBLEM?

Weeds compete for:

- space
- water
- nutrients
- light

Control takes time/\$

In a pasture, serious weed problems almost always indicate management deficiency.

When is direct action advised?

- New invaders
- Poisonous plants
- Perennial weeds
- The war is lost!



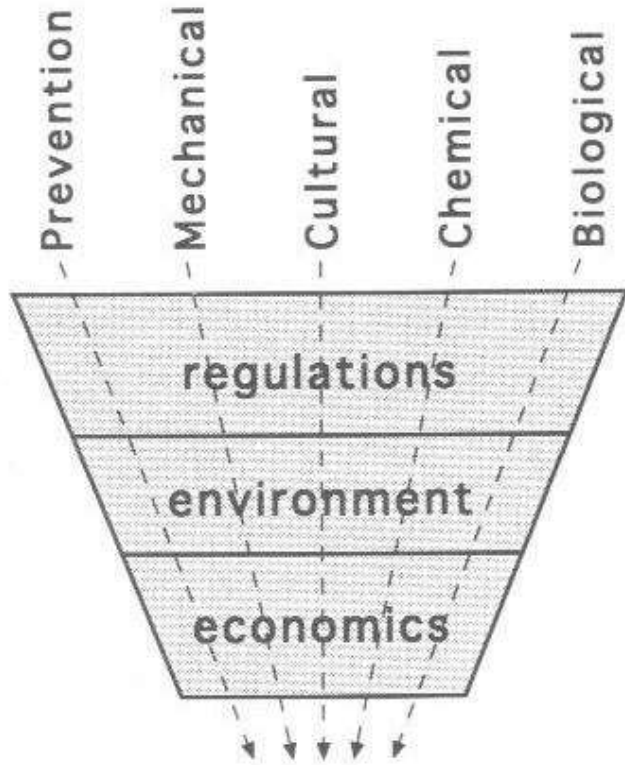
INTEGRATED WEED MANAGEMENT

Scouting – On the ground management

- Gates
- Water
- Feed bunks
- Bedding area
- Fences
- Right of way



INTEGRATED WEED MANAGEMENT



Integrated Weed Management (IWM)



WEED ESTABLISHMENT

<u>Weed</u>	<u>Seed/yr</u>
Wild oat	250
Canada thistle	680
Shepardspurse	38,500
Redroot pigweed	117,000
Russian thistle	500,000



WEED PERSISTENCE

<u>Weed</u>	<u>Yrs viable</u>
Quack grass	1-6
Wild oat	4-7
Field bindweed	20+
Canada thistle	21
Redroot pigweed	40



WEED MANAGEMENT STRATEGIES

Prevention

Mechanical Control

Cultural Control

Biological Control

Chemical Control



PREVENTION

Roots and Seeds in:

- equipment
- seed, transplants
- manure and compost
- hauled top-soil



MECHANICAL CONTROL

- Tillage
- Mowing
- Flooding
- Burning
- Mulching
- Hand weeding



CULTURAL CONTROL

Healthy pastures are more competitive!

- Proper nutrition/soil health

Minimize weed access to nutrients?

- Hard to do once established

Crop rotation

- Establish pasture after a broadleaf crop

Nurse/companion crops

- Clovers produce N, but limit herbicide options



BIOLOGICAL CONTROL

Health soils promote crops

Insects/disease to control perennial weeds

- Canada thistle
 - root weevil, stem gall fly, seed head fly
- Rush skeletonweed
 - stem gall midge, bud gall mite, rust fungus



CHEMICAL CONTROL

- Phytotoxic chemicals
- Very effective
- Responsible and judicious use!!!
- Abuse and lose.....



FACTORS INFLUENCING HERBICIDE PERFORMANCE

Environmental Influences

- Soil factors
 - adsorption, texture
- Climate factors
 - Temperature, precipitation, humidity, wind

Growth Stage Influences

- emergence - easiest to control
- vegetative
- flowering
- maturity - already set seed?
- fall regrowth



HERBICIDES REGISTERED FOR ANNUAL GRASSES

System	Outrider	Plateau	Matrix Laramie	Landmark	Axiom
Pasture	X	X			
Range	X	X	X*	X*	
Rights of Way	X	X	X	X	
Hay	X				X

* Not grazed by livestock



HERBICIDES REGISTERED FOR ANNUAL GRASSES

System	Esplanade	Diuron + Metribuzin	Milestone	Amber ¹	Arrow 2EC Select, Envoy
Pasture		X	X	X	
Range	X*	X	X	X	X*
Rights of Way	X	X	X	X	X
Hay					

* Not grazed by livestock

¹cheatgrass, possibly ventenata



HERBICIDES REGISTERED FOR ANNUAL GRASSES

System	Fusilade	Glyphosate
Pasture		X
Range		X
Rights of Way	X	X
Hay		X



HERBICIDE OPTIONS

2,4-D

dicamba (Vanquish, Banvel)

2,4-D + dicamba (WeedMaster)

dicamba+ diflufenzopyr (Overdrive)

triclopyr (Remedy)

2,4-D + triclopyr (CrossBow)

triclopyr + clopyralid (Redeem)

2,4-D + picloram (Grazon P+D)

fluroxypyr + picloram (Surmount)

fluroxypyr + triclopyr (Pasturegard)



HERBICIDE OPTIONS (CONT.)

diuron (Direx, Diuron)

metsulfuron (Cimarron)

metsulfuron + 2,4-D + dicamba (Cimarron MAX)

hexazinone (Velpar)

tebuthiuron (Spike)

paraquat (Gramoxone Extra)

glyphosate (Roundup UltraMax)

imazapic (Plateau)



SPECIAL PRECAUTIONS FOR HERBICIDES

Drift

- Particle Drift
- Vapor Drift

2,4-D Formulations - amine vs ester

Groundwater Protection

Contaminated Equipment - SU's especially

Soil Residual Herbicides - sterilants !!!!!

Soil Persistence



PNW WEED MANAGEMENT HANDBOOK

- Make sure you can identify the weed
- Some products may require an applicators license to purchase/apply
- Read and follow label directions
- Pay close attention to REI
- Wear correct PPE

