Pasture and Field Renovation

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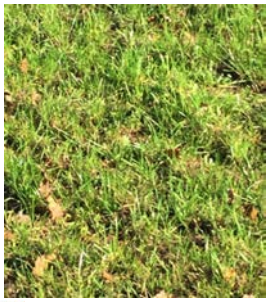
Observations from the Netherlands

Perennial Ryegrass..everywhere

Feed management in Europe



New opportunities….

Some local resources

- This Old Hayfield
http://umaine.edu/publications/2491e/

- Improving Pastures and Hayfields
https://extension.unh.edu/resources/files/Resource000031_Rep31.pdf

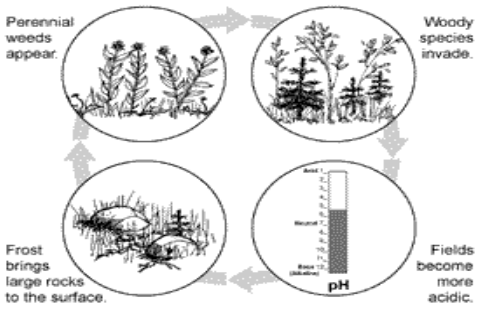
Field renovation

Renovation can be either partial or total

Partial renovation will generally be when poor stand establishment, winter injury, drought, or flooding destroy a portion of the field. In such cases, many times no-till drills will be used to reseed these areas. Species enhancement with a no-till drill can also be part of a partial renovation

Total renovation in its purest sense can be defined as the destruction of the sward followed by reestablishment of either the same species or another species. Total renovation often includes plowing, disking and re-seeding. (drainage tile?)

What Happens When Fields Are Neglected



Field Renovation

- Always start with the *most likely causes*
- Always start with the *cheapest solutions*

Pasture Renovation…..Can't Do Without This:

- 10 - 15 cores/area, mix in bucket

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Look for the Obvious

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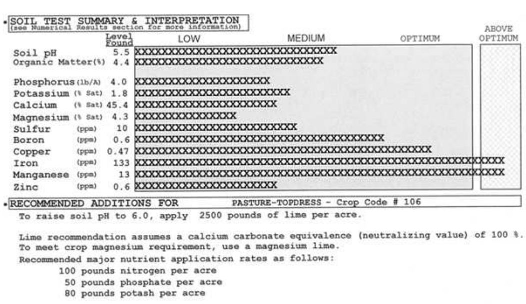
Soil test recommendations



SOIL TEST SUMMARY & INTERPRETATION
(see Numerical Results section for more information)

		Level Found	LOW / MEDIUM / OPTIMUM / ABOVE OPTIMUM
Soil pH		5.5	XXXXXXXXXXXXXXXXXXXXXXXXXXXXXX
Organic Matter(%)		4.4	XXXXXXXXXXXXXXXXXXXXXXXXXXXX
Phosphorus	(lb/A)	4.0	XXXXXXXXXXXXXXXXXXXX
Potassium	(% Sat)	1.8	XXXXXXXXXXXXXXXXXXXXXXX
Calcium	(% Sat)	45.4	XXXXXXXXXXXXXXXXXXXXX
Magnesium	(% Sat)	4.3	XXXXXXXXXXXXXXX
Sulfur	(ppm)	10	XXXXXXXXXXXXXXXXXXXXXXXX
Boron	(ppm)	0.6	XXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXX
Copper	(ppm)	0.47	XXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXX
Iron	(ppm)	133	XXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXX
Manganese	(ppm)	13	XXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXX
Zinc	(ppm)	0.6	XXXXXXXXXXXXXXXXXXXXX

RECOMMENDED ADDITIONS FOR PASTURE-TOPDRESS - Crop Code # 106

To raise soil pH to 6.0, apply 2500 pounds of lime per acre.

Lime recommendation assumes a calcium carbonate equivalence (neutralizing value) of 100 %.
To meet crop magnesium requirement, use a magnesium lime.
Recommended major nutrient application rates as follows:
100 pounds nitrogen per acre
50 pounds phosphate per acre
80 pounds potash per acre

Apply 1/2 N in early spring, remainder in late August or early September.

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Surface Applied Lime

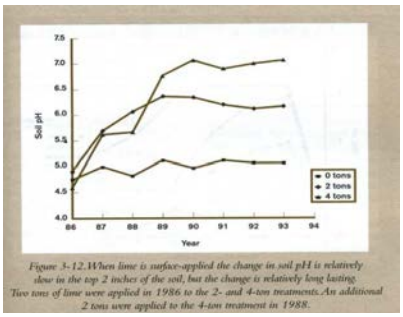

Figure 3-12. When lime is surface-applied the change in soil pH is relatively slow in the top 2 inches of the soil, but the change is relatively long lasting. Two tons of lime were applied in 1986 to the 2- and 4-ton treatments. An additional 2 tons were applied to the 4-ton treatment in 1988.

Trouble-Shooting

- Low forage yield
- Poor forage quality
- Or both…

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Trouble-Shooting Quality

High fiber and low protein?

Yes

Cut Earlier !!!!!!

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Trouble-Shooting Yield

Is soil pH or soil P / K limiting??

Fix this FIRST!!

Current N management?

Yes

Responds to changes in N management

No

Other Constraints?

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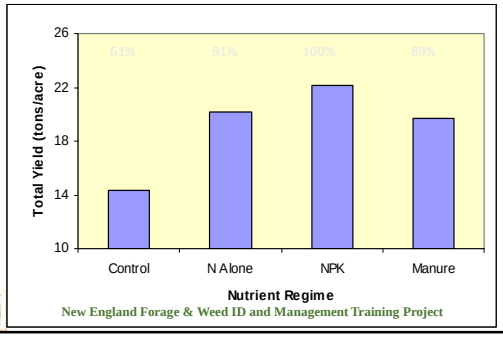
Fertility Response of Long-Term Hayfield



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Poultry manure

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Improving pastures through management

Crashing Pasture Syndrome

- Poor yield
- Low quality
- Weedy

Is it over grazing or under grazing?

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Traditional Pastures are often "Continuously Grazed"

This usually means:

- Lower yields
- Serious weed pressure
- Erosion problems
- General "poor" management

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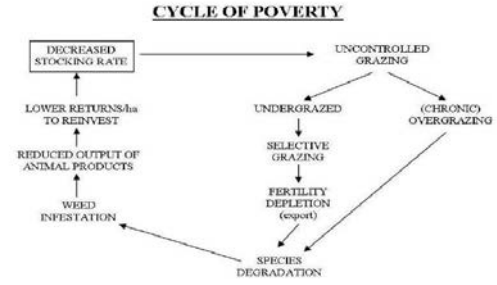

Figure 1.5 How uncontrolled grazing contributes to the "Cycle of Poverty". Adapted from Thomas and Goit 1986

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Intense rotation - little chance of selection

Intensively grazed by sheep, for 2 days

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In Rotational Grazing...

- Pastures are subdivided into smaller areas (or paddocks)
- A portion of the pasture is grazed while the remainder "Rests"
- Paddocks are allowed to:
  - Renew energy reserves
  - Rebuild plant vigor
  - Improve long-term production

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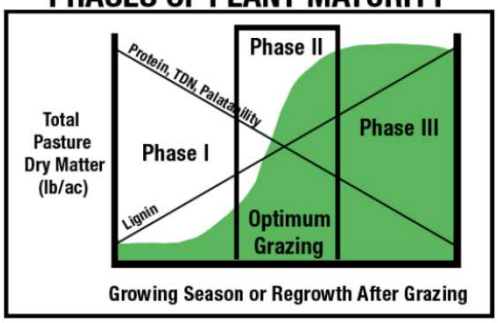
PHASES OF PLANT MATURITY



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CYCLE OF PLENTY

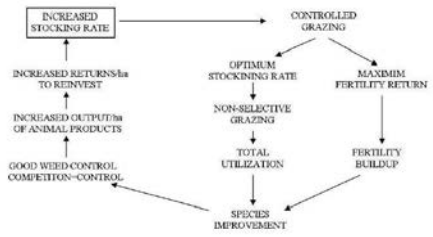

Figure 1.6 How controlled grazing contributes to the "Cycle of Plenty". Adapted from Thomas and Goit 1986

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Harvesting has a role in grazing system

Take first cutting and then graze in July and August….in reverse!

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Decisions about renovation….

- Species composition…problem weeds?

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Renovation….and weeds

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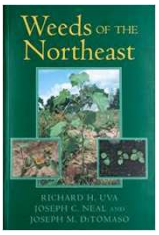
Controlling existing vegetation

- Woody perennial plants
- Perennial herbaceous plants
- Annual /biennial weeds



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Existing weeds

- Know what cultural practices reduce weed vigor/seed "rain"

--mowing

--"eating " Kathy Voth

"cows eat weeds"

--multispecies grazing

- Chemical control options

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Chemical control options/pastures grass hayfields

Chemical Weed Control in Grass Pastures

Situation	Amount of Product(s) per Acre	Remarks and Limitations
Summer annual broad-leaf weeds: lambs-quarters, pigweeds, etc.	2 pt. 3.8 lb./gal. 2,4-D formulation1 or 1/2 pt. Banvel/Clarity	**GROUP 4 HERBICIDES•** Apply to small, actively growing plants in spring or early summer
Winter annual and biennial broadleaf weeds: shepherdspruse, com-mon burdock, spotted knapweed, bull thistle	2–3 pt. 3.8 lb./gal. 2,4-D formulation1 or 1/2 pt.- 1pt. Banvel/Clarity	**GROUP 4 HERBICIDES•** Apply to rosettes or other fall growth in fall or early spring. Use low rate for winter annuals and high rate for biennials.
Sample perennial broadleaf weeds: tall buttercup, chicory, dandelion, curly dock	3–4 pt. 3.8 lb./gal. 2,4-D formulation1 or 1/2 pt.- 1pt. Banvel/Clarity	**GROUP 4 HERBICIDES•** Apply to rosettes or other fall growth in fall or early spring.
Creeping perennial broadleaf weeds: horsenettle, common milkweed, leafy spurge, Canada thistle	4 pt. 3.8 lb./gal. 2,4-D formulation1 + 2 pt. Banvel/Clarity	**GROUP 4 HERBICIDES•** Apply after weeds have reached the bud stage in mid- to late summer (before killing frost).
Bedstraw plus a wide variety of annual, biennial, and perennial broadleaf weeds.	2 qt. Crossbow	**GROUP 4 HERBICIDES•** Apply to actively growing bedstraw in fall before killing frost., Do not allow lactating dairy animals to graze treated areas until the next growing season following application of this product and do not harvest hay for 14 days after application. For other livestock, there are no grazing restrictions following application of this product. During the season of application, withdraw livestock from grazing treated grass at least 3 days before slaughter.

http://fieldcrops.org/Forages/Pages/WeedControl.aspx

http://pss.uvm.edu/pdpforage/Materials/WeedMgt/Pasture_Hay_Weed_guide_uDel2014.pdf

Restrictions…

- In pastures treated with 2,4-D or Banvel/Clarity, the following restrictions must be followed: 2,4-D—Do not graze lactating dairy animals for 7 days after treatment. Remove meat animals from treated areas for 3 days before slaughter if less than 14 days have elapsed since treatment. Do not cut treated grass for hay within 30 days after application. Banvel/Clarity—Do not graze lactating dairy animals for 7 days after treatment with up to 1 pt./A, and 21 days after 2 pt./A, of Banvel/Clarity. Do not harvest hay for lactating dairy animals before 37 days after application of 1 pt./A of Banvel or Clarity and before 51 days after application of 2 pt./A of Banvel or Clarity. Remove meat animals from treated areas 30 days before slaughter. There is no waiting period between treatment and grazing for non-lactating animals.

Aminopyralid Herbicides….caution!!!

Aminopyralid is the active ingredient in Milestone and Forefront herbicides

Broadleaf weed control in pastures was the main agronomic labeled use

Provided excellent Smooth Bedstraw control…but….

This Active ingredient is very, very persistent

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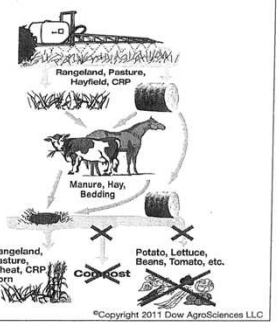
IMPORTANT USE PRECAUTIONS AND RESTRICTIONS TO PREVENT INJURY TO DESIRABLE PLANTS

- Carefully read the section **"*Restrictions in Hay or Manure Use*."**
- It is mandatory to follow the **"*Use Precautions and Restrictions*"** section of this label.
- Manure and urine from animals consuming grass or hay treated with this product may contain enough aminopyralid to cause injury to sensitive broadleaf plants.
- Hay can only be used on the farm or ranch where product is applied unless allowed by supplemental labeling.
- Consult with a Dow AgroSciences representative if you do not understand the "Use Precautions and Restrictions". **Call [1-(800) 263-1196] Customer Information Group.**

Forage and Manure Management



Sale, Distribution, or Use in New York State

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Alternatives to Milestone and Forefront for Bedstraw Control

--Control seed formation for a year by cutting early

--Improve fertility and soil pH to encourage aggressive grass growth

--Crossbow herbicide applied in late summer or early fall is very effective if combined with the above practices.

Total Pasture renovation

- Benefits vs costs
- Equipment requirements
- Loss of productivity time?
- Methods

Timing of seeding

- Seeding needs to be done when conditions favor the growth of the desirable species and limit the growth of annual weeds
- Early Spring or late summer are "usually" dependable times

What about a "Nurse Crop"

- Usually oats or other small grain sown at a low rate (15-30 pounds per acre)

+ Provides quick cover (weed control)

+ Provides some extra feed for first cutting

+ Helps to control soil erosion

- Competes against the forage seeding for water, light, and nutrients

Seeding Methods

- How to remove existing vegetation?

Competition

- "kill" sod with herbicides
- "manage sod" through harvest
- autotoxicity
- double crop/harvest

--use residue as mulch

- post seeding vegetation control

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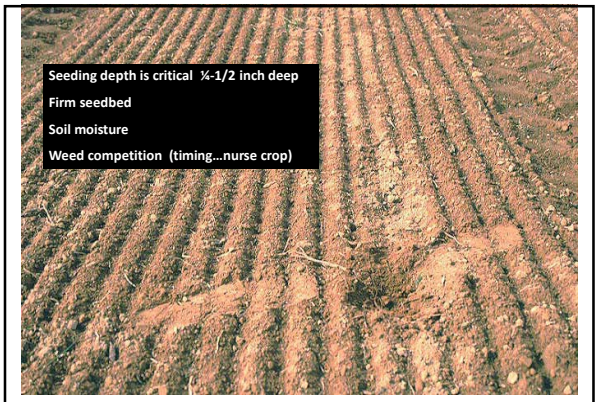

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Establishment costs (Using 2014 Pa. Custom rates)

- Soil test --$15 Lime $90/ton
- Plow--$22.80/acre
- Disk harrow (2x) $29/acre
- Plant $18/acre
- Seed $50/acre
- Pick rocks….?
- Herbicide for problem weeds?
- Fertilizer costs…could be $180-200/acre

What about using a grain drill for seeding?

- Row spacing on grain drills tend to be 6-7 inches
- Recommend that sow ½ of the seed in one direction and the other ½ in a perpendicular or 45 degree angle
- Check seed depth often.

No-till establishment

No-till Forage establishment

- Less labor, time, fuel
- Conserves soil moisture
- Reduces erosion potential

- Cons…
- Need a good drill
- Seed depth is hard to adjust
- No incorporation of soil amendments

Basics of no-till drills

- Heavy machinery

--300-600 lbs/ft of width

- slit/close/press wheel
- 4-6-8 inch spacing--double drill?
- Too dry--depth
- Too wet--slit may not close

--"want to see some seeds on the ground"

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No till drills-- What are the basics?

- Seeding Depth is critical -1/2-1/4 inch
- Timing is important

--warm season crops

--cool season crops

--soil moisture

- Controlling existing vegetation

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Other Seeding methods..

- Frost seeding
- Animal Seeding
- Rotational crops
- "extended season"

Frost Seeding—Wishful Thinking or Low tech Wonder?

- Theory…Scatter seeds on soil and frost actions "works" the seed into the ground along with spring rains
- Traditionally thought of as early technique for early spring seeding—after snowmelt
- Good fact sheet-- http://www.uwex.edu/ces/crops/frostsd.htm

Frost seeding Youtube video

- http://www.youtube.com/watch?v=RWR2n4sMcVs

Frost seeding works best when..

- Bare soil is present..ie little or no thatch
- Larger seeds work better, so legumes have a better chance of success than grasses
- Usually use cheap seed
- Competition during establishment can be managed—either mowing or grazing
- Can alter species composition in a pasture setting

Using Animals to seed pastures

- Many principles the same as with frost seeding
- Use managed grazing as a technique to work seed into ground
- Controlling vegetation is important.
- Can revitalize "waste" areas, winter yards, etc.
- Use to introduce season extending crops such as brassica sps.

The role of plant diversity:

- **Greater likelihood of something green and growing more days of the year**
- **Interlaying of different leaf types**
- **More solar energy captured more days of the year**