Impacts of Weeds on Forage Quality

Basic Concept

• Weeds are forages too
Impacts of Weeds on Forage Quality

The management questions are:

- Forage quality of weeds?
- Toxic or anti-feeding qualities present?
- Hindrances to effective management?
- Insect or nematode interaction
- Forage drying time, storage
- Forage stand longevity
- Tonnage often reduced
Annual Weeds – Forage Quality

Nutrient Composition/Digestibility

Similar to Alfalfa
- R. Pigweed, C. Lambsquarters, C. Ragweed

Lower than Alfalfa
- Giant and Yellow Foxtail, Shepherdspurse, P. Smartweed

(Marten and Andersen, 1975, Temme et al., 1979)
Relative Palatability of two perennial forages and 10 weeds. Trials in 1982 were conducted when first-crop alfalfa was mid-bloom (S3) stage (Marten, G.C., C.C. Sheaffer, and D.L. Wyse. 1987. Forage nutritive value and palatability of perennial weeds. Agron. J. 79.)
PERENNIAL WEEDS – FORAGE QUALITY

Forage Quality Relative to Alfalfa

Similar
- Dandelion, White Cockle

Lower
- Quackgrass, Yellow Rocket

Much Lower
- C. Dock, C. Thistle, H. Alyssum
  S. Smartweed, J. Artichoke

(Dutt et al., 1982; Dutt et al., 1979; Marten et al., 1983)
Roundup Ready Alfalfa

- It’s Forage Quality……..
- GMO issues?
  - Not for organic production
- Natural tolerance is there….  
- Value gained that off-sets technology fee?
- New weed management ops
Roundup Ready Alfalfa

- Costs
- PHI
- Value added for marketers
- Resistance mgt.
  - Is there any crop left where Roundup will not be used?
Roundup Ready Alfalfa

Jerry Doll said it all!

Many of the following comments are from his writings
Roundup Ready Alfalfa

- USDA - APHIS approved July 14, 2005
- EPA approved label for weed control in alfalfa July 15, 2005
- State approvals in place for Roundup Original MAX and Weather MAX MAX, Ultra Max II
Roundup Ready Alfalfa

• Forage Genetics and Monsanto secured approval for Mexico
• Japan and Canada?
  – Expected prior to 1st harvest ‘06’
• Other global mkts pending
• Limited Domestic Launch (LDL)
  – Dometic mkts dormant and non
Roundup Ready Alfalfa

Limited Domestic Launch (LDL)

- Monsanto Tech/ Stewardship agreement
  - Seed and Feed Use Agreement
    (Domestic Containment Agreement)
  - ensure on-farm use of forage
  - if sold, certify on-farm use in USA
Roundup Ready Alfalfa

Is any out there........?

• Est. seed for 50 to 70,000 acres fall 05 (mostly west coast)
• More in 2006
Roundup Ready Alfalfa

Why Me????

• Weed control easier
  – But will it pay?
  – Little treated now
  – Better than competitors?
  – Space-Bank the tech fee....
Roundup Ready Alfalfa

New windows of opportunity....

• Dandelion, white cockle, hoary alyssum, smooth and curly dock, E B nightshade

• Dodder

• Still rate dependent
  – e.g. Colq still a problem
Roundup Ready Alfalfa

Now what’s this going to cost?

• $125 / 50 lb bag east of Rockies
  – $150 west of the Rockies

• 12 lb/A seeding rate = $30/A
  – Absent tolerance gene, is it the alflafa variety you really want?
Roundup Ready Alfalfa

First perennial GMO crop approved!

• Mkt. share potential of RR soybeans?
Roundup Ready Alfalfa

Even RR won’t solve

- Rain on cut hay
- Winter kill
- Disease
  - Depreciate costs of tech fee over 3 to 5 years?
Roundup Ready Alfalfa

Supplemental label

(Orig.MAX 4.5 ae)

• 5.3 qts / yr including preplant
• 4.1 qts / yr in crop
• 44 fl oz / A single applications
Roundup Ready Alfalfa
Roundup WeatherMAX
Roundup OriginalMAX
Roundup UltraMAX II
• similar labeling
Roundup Ready Alfalfa

- Remove livestock before app., 5 day grazer REI
- 5 day PHI
  - (grazing, cutting or feeding)
  - sequentials at least 7 days apart
  - Up to 10% non RR seed
    - apply 22 fl oz before 3 - 4 trifoliate to avoid gaps in stand (??)
Roundup Ready Alfalfa

RoundupWeatherMAX
16 fl oz (0.56 ae)
22 fl oz (0.75 ae)

Raptor 4 fl oz (0.031 ai)
Select 8 fl oz (0.125 ai)
10 fl oz (0.156 ai)

Buctril 1.25 pt (0.31 ai)
Roundup Ready Alfalfa Herbicide Comparisons
Solo Seeding  Weed Control  Rosemount MN  July 11, 2003

- Roundup Weather Max  4 t 6 in. weeds  Raptor, Select  3 to 4 in. weeds  Oat 4 - 6 in.  Alfalfa all RR
- Roundup w/ 5.9 pt N-Pak-AMS  Raptor and Select w/ 1qt COC + 2 qt UAN.
Roundup Ready Alfalfa Herbicide Comparisons
Solo Seeding Weed Control  Rosemount MN  July 11, 2003

Weed Control (%)

GR  Chlorosis

Roundup Weather Max  4 to 6 in. weeds. Raptor, Select  3 to 4 in. weeds  Oat 4 - 6 in.  Alfalfa all RR
Roundup w/ 5.9 pt N-Pak-AMS. Raptor and Select w/ 1qt COC + 2 qt UAN.
Direct Seed    Check    July 11 2003
Direct Seed
Roundup 0.75
July 11 2003
Flash?
Potassium?
Leafhopper?
Rosemount 2005 RR Alfalfa Establishment Study
Roundup Ready Alfalfa

**RoundupWeatherMAX**
16 fl oz (0.56 ae)  $10.22

**Raptor**
4 fl oz (0.031 ai)  $20.28

**Select**
8 fl oz (0.125 ai)  $16.20
Roundup Ready Alfalfa Establishment Systems
First Season % Weed Control  Rosemount MN, June 30  2005

![Bar chart showing weed control percentages for various treatments.]

- Oat
- Gift
- Colq
- Poam
- Vele
- Cocb
- Wimu

Roundup Weather Max  4 t 6 in. weeds.  Raptor, Select  3 to 4 in. weeds
Roundup w/ 5.9 pt N-Pak-AMS.  Raptor and Select w/ 1qt COC + 2 qt UAN.

Alfalfa RV=RR038BD-218, -210
CV=54V46, Rebound 5.0
Direct Seed, Raptor 4 oz. Conventional cultivars
Direct Seeded  Roundup 16 oz.  RR Cultivars
Oat Boot, Conventional Cultivars
Oat mulch, Raptor 4 oz. Conventional cultivars
Oat mulch, Roundup 16 oz.  RR cultivars
Oat mulch, Roundup 16 oz. RR cultivars. Close-up
Oat mulch, Select 8 oz.  Conventional cultivars
Roundup Ready Alfalfa Establishment Systems
First Season Alfalfa Yield  Rosemount MN,  2003

Oatlage  Alfalfa  Weeds  Total

DM Yield (tons / A)

Solo Raptor 0.031  Solo Roundup 0.56  Solo  O M Raptor 0.031  O M Roundup 0.56  O M Select 0.125  Oat Boot

Roundup Weather Max  4 t 6 in. weeds. Raptor, Select  3 to 4 in. weeds
Roundup w/ 5.9 pt N-Pak-AMS.  Raptor and Select w/ 1qt COC + 2 qt UAN.

Alfalfa RV=RR038BD-218, -210
CV=54V46, Rebound 5.0
Roundup Weather Max  4 t 6 in. weeds. Raptor, Select  3 to 4 in. weeds
Roundup w/ 5.9 pt N-Pak-AMS.  Raptor and Select w/ 1qt COC + 2 qt UAN.

Alfalfa RV=RR038BD-218, -210
CV=54V46, Rebound 5.0
Roundup Ready Alfalfa Establishment Systems
First Season Oatlage Yield  Rosemount MN, 2005

1st Cut  2nd Cut  3rd Cut  Total

DM Yield (tons / A)

0  1  2  3  4

Solo Raptor 0.031 CV
Solo Roundup 0.56 RV
Solo CV
Solo RV
O M Raptor 0.031 CV
O M Roundup 0.56 RV
O M Select 0.125 CV
Oat Boot CV
Oat Boot RV

Roundup Weather Max 4 to 6 in. weeds. Raptor, Select 3 to 4 in. weeds
Roundup w/ 5.9 pt N-Pak-AMS. Raptor and Select w/ 1qt COC + 2 qt UAN.

Alfalfa RV=RR038BD-218, -210
CV=54V46, Rebound 5.0
Roundup Ready Alfalfa Establishment Systems
First Season Weed Yield     Rosemount MN,  2005

**DM Yield (tons / A)**

**1st Cut**  **2nd Cut**  **3rd Cut**  **Total**

Solo Raptor 0.031 CV
Solo Rup 0.56 RV
Solo CV
Solo RV
OM Raptor 0.031 CV
OM Roundup 0.56 RV
OM Select 0.125 CV
Oat Boot CV
Oat Boot RV

OM = Oat Mulch System

Roundup Weather Max  4 to 6 in. weeds.  Raptor, Select  3 to 4 in. weeds
Roundup w/ 5.9 pt N-Pak-AMS.   Raptor and Select w/ 1qt COC + 2 qt UAN.  

Alfalfa RV=RR038BD-218, -210
CV=54V46, Rebound 5.0
Rosemount 2005 RR Alfalfa Herbicide Comparison Study
Roundup Ready Alfalfa Herbicide Comparisons
Solo Seeding Alfalfa Yield Rosemount MN 2005

- **Check**
- **Roundup 0.75**
- **Roundup 1.5**
- **Raptor 0.031**
- **Select 0.125**
- **Sel 0.156 + Buc 0.3**

DM Yield (tons / A)

- **1st Cut**
- **2nd Cut**
- **3rd Cut**
- **Total**

Roundup Weather Max 4 t 6 in. weeds, other trts. 3 to 4 in. weeds
Raptor and Select w/ 1qt COC + 2 qt UAN
Select + Buctril w/1 qt COC

R04BD-2411 Alfalfa
Roundup Ready Alfalfa Herbicide Comparisons
Solo Seeding  %Weeds Harvested  Rosemount MN  2005

Weed Composition (%)

1st Cut 2nd Cut

Check Roundup 0.75 Roundup 1.5 Raptor 0.031 Select 0.125 Sel 0.156 + Buc 0.3

Roundup Weather Max  4 t 6 in. weeds, other trts. 3 to 4 in. weeds
Raptor and Select w/ 1qt COC + 2 qt UAN  Select + Buctril w/1 qt COC
Select 8 oz. (0.125 ae) COC 28%  RR cultivar
Untreated Check    RR cultivar
Raptor 4 oz. (0.032 ae) COC 28% RR cultivar
Roundup WeatherMax 43 oz. (1.5 ae). RR cultivar
Roundup WeatherMax 21 oz. (0.75 ae). RR cultivar
Select 10 oz. + Buctril 1.25 pts (0.156 + 0.31 ae) COC  RR cultivar
Roundup Ready Alfalfa Herbicide Comparisons
Solo Seeding Weed Control Rosemount MN June 30, 2005

Roundup Weather Max 4 t 6 in. weeds, other trts. 3 to 4 in. weeds
Raptor and Select w/ 1qt COC + 2 qt UAN
Select + Buctril w/1 qt COC

Gift Colq Paom Vele Wimu Cocb
Roundup Ready Alfalfa Herbicide Comparisons
Solo Seeding   Crop Injury   Rosemount MN   June 30, 2005

Growth Reduction  Chlorosis

Visual Crop Injury (%)
0  5  10  15  20

Roundup 0.75  Roundup 1.5  Raptor 0.031  Select 0.125  Sel 0.156 + Buc 0.3

Roundup Weather Max  4 t 6 in. weeds, other trts. 3 to 4 in. weeds
Raptor and Select w/ 1qt COC + 2 qt UAN  Select + Buctril w/1 qt COC
Ready or not, here it comes!

- It’s still the weed basics
- It does open up new weed management potential
- Does it fit your operational needs?

- Questions?