Advanced Cover Cropping Tips from a Great Plains Perspective

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Farming Background

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- No-tilling for 25+ years
- 2/3 dryland 1/3 irrigated
- Corn – Beans – Cereal rotation
- Added rye, triticale, oats, barley, vetch, sunflowers, buckwheat

Farming Background

- Cover crops for 8 years
- Green Cover Seed started in 2009
- 6,000 customers in all 50 states

“As to methods there may be a million and then some, but principles are few. The man who grasps principles can successfully select his own methods. The man who tries methods, ignoring principles, is sure to have trouble.”

Ralph Waldo Emerson

Basic Understandings

- **Cover Crops are unlikely to work well if they are squeezed into an already existing system or rotation without making other changes to the system.**

- **A highly managed *Systems Approach* to cover crops and soil health is crucial to success in both the short term and the long term.**

Cover Crops Are Easy

- **Planted in July and August after cereal (wheat) or pea harvest**
- **Lots of choices of species that work well**
- **Lots of time to grow**
- **Lots of biomass above and below the ground**
- **Lots of benefits**

Challenge : Short Planting Window in Corn-Bean Rotation

- **Corn-Bean rotation does not always lend itself to cover crop establishment due to limited planting and growing windows in both fall and spring**

Short Planting Window in Corn-Bean Rotation

- New Cover Crop!
- Plant as late as you want!
- Overwinters great but it is not a challenge to control in the spring
- Fixes N-P-K and whatever else you need
- Will grow tons of biomass but not be hard to plant into
- Fixes compaction, pH and salinity
- Very inexpensive

Jack’s Magic Beans!

Open the Window As Much As Possible

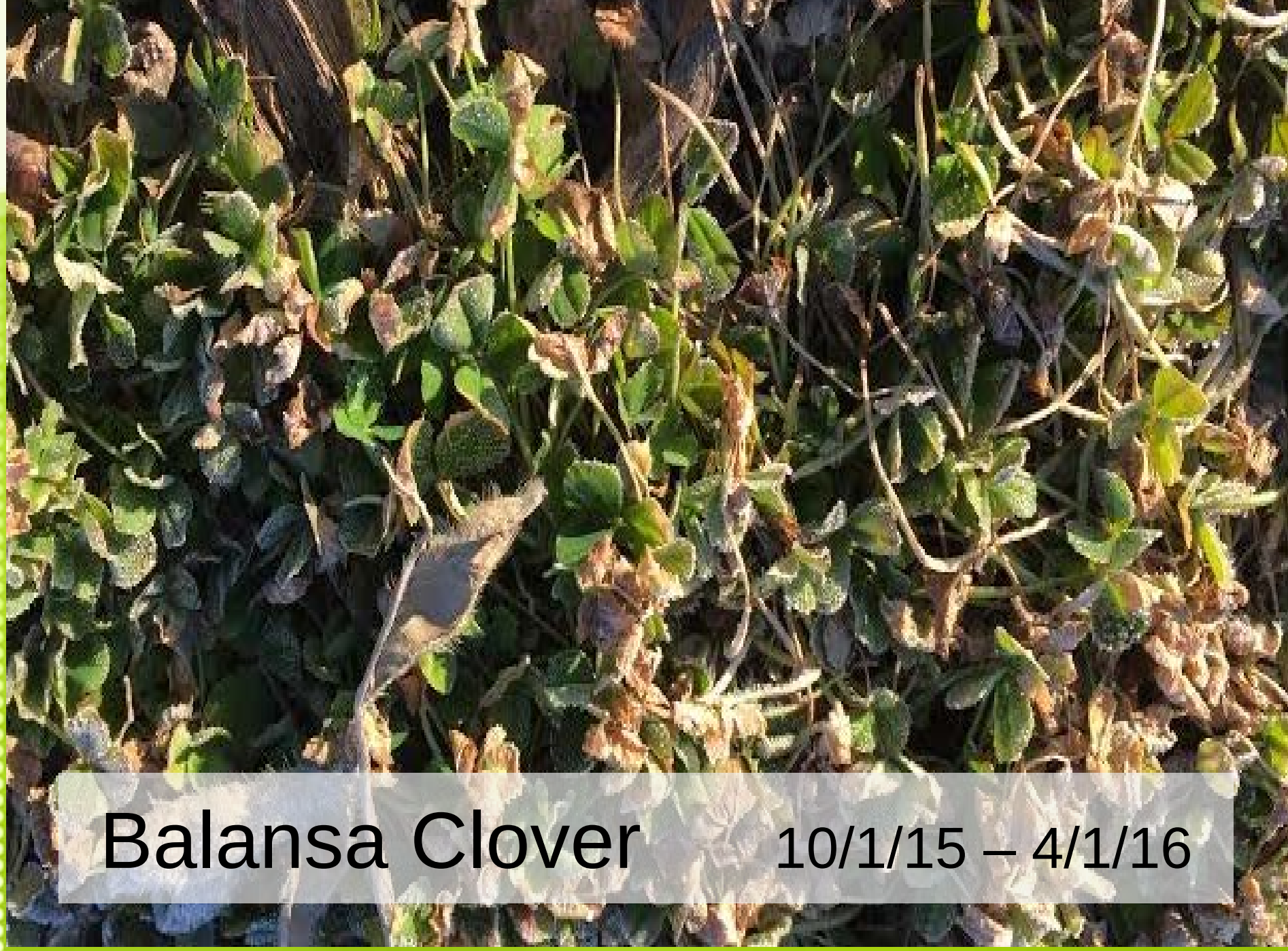
- Plant shorter season varieties – especially soybeans
- Plant “cover crop fields” first
- “Relay” seeding with airplane prior to harvest
  - Hit and Miss – especially with dryland/low rainfall
  - Timing is critical
    - Too early and can die from lack of sunlight
    - Too late and growth will be limited

Open the Window As Much As Possible

- Use most cold tolerant species possible for your area
  - Cereal rye: can be seeded almost anytime (we planted some mid-Dec)
  - Annual ryegrass: seeded by Sept 25th for best results
  - Oats: seeded by Sept 15th
  - Radish: seeded by Sept 25th
  - Rapeseed/canola: seeded by Oct 25th

Open the Window As Much As Possible

- Use most cold tolerant species possible for your area
  - Hairy vetch: seeded by Oct 25th
  - Winter peas: hit and miss Plant deep and timing like wheat for best overwintering
  - Winter lentils: some areas better than others
  - Crimson clover: Works decent further south (I70) – not winter hardy consistently
  - Balansa clover – more cold tolerant annual clover that shows some promise for more northern areas



Balansa Clover

10/1/15 – 4/1/16

Balansa Clover
10/1/15 – 5/11/16

Austrian Winter Peas 10/1/15 – 5/11/16

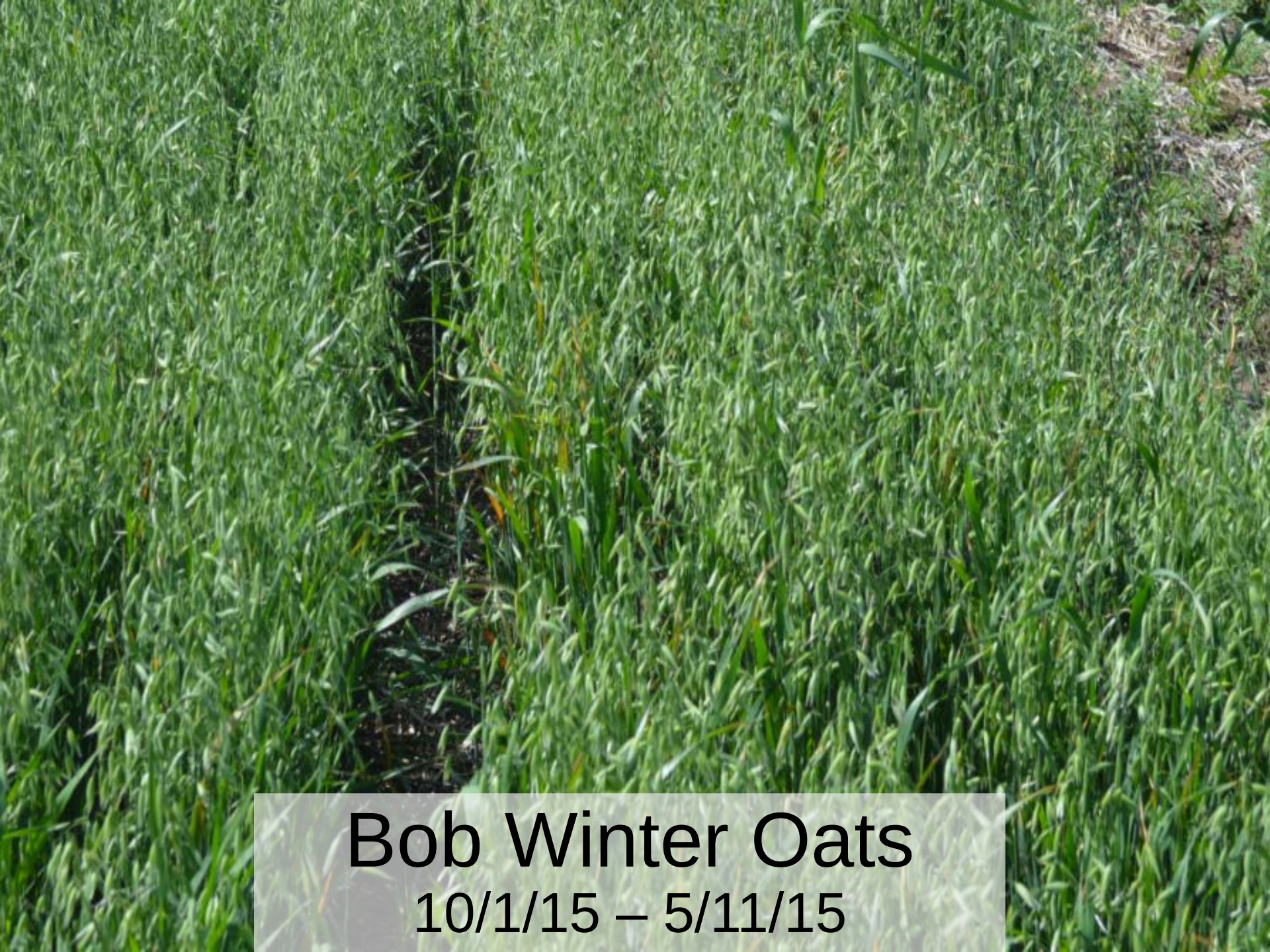
Crimson Clovers

10/1/15 – 5/11/16

Hairy Vetch 10/1/15 – 5/11/16

Hairy Vetch 10/25/16 – 6/7/17

Morton Winter Lentils 10/1/15 – 5/11/16



Bob Winter Oats

10/1/15 – 5/11/15

Annual Ryegrass

10/1/15 – 5/11/15

Open the Window As Much As Possible

- Winter Barley
  - Less alleopathic
  - Less risk of nutrient tie-up
  - Less risk of it “getting away”
  - Not as good of weed control
  - Not as winter hardy
  - New varieties coming

919 Winter Barley and Triticale

10/1/15 – 5/11/15

Open the Window
As Much As Possible

- Use Elbon cereal rye instead of northern rye varieties
  - Bred in Oklahoma so it has a short dormancy period
  - Grows longer in fall and earlier in the spring that northern rye
  - Still very winter hardy
  - Generally smaller seed size also 22 – 24K

Elbon Rye 10/1 – 5/11
VNS Northern Rye 10/1 – 5/11

Elbon Rye vs Triticale

10/1/15 – 5/11/15

Open the Window
As Much As Possible

- Let covers grow into the spring as long as possible
- Easier with beans than it is with corn
- Increased ***Risk*** on dry land
- Nutrient management becomes much more important with corn
- More of an “organic” mind set

Sprayed 4/1/16
Sprayed 4/30/16
Picture taken 5/4/16
Rye/Trit/Oat/Barley Blend 10/1/15

Sprayed 4/1/16
Picture taken 5/7/16
Rye/Trit/Oat/Barley Blend
10/1/15

Sprayed 4/1/16
Picture taken 5/7/16
Rye/Trit/Oat/Barley Blend
10/1/15

Irrigated corn planted April 20 into cover crop rye

picture taken 5/11/12

Irrigated corn planted April 20 into cover crop rye

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Irrigated corn planted April 20 into cover crop rye

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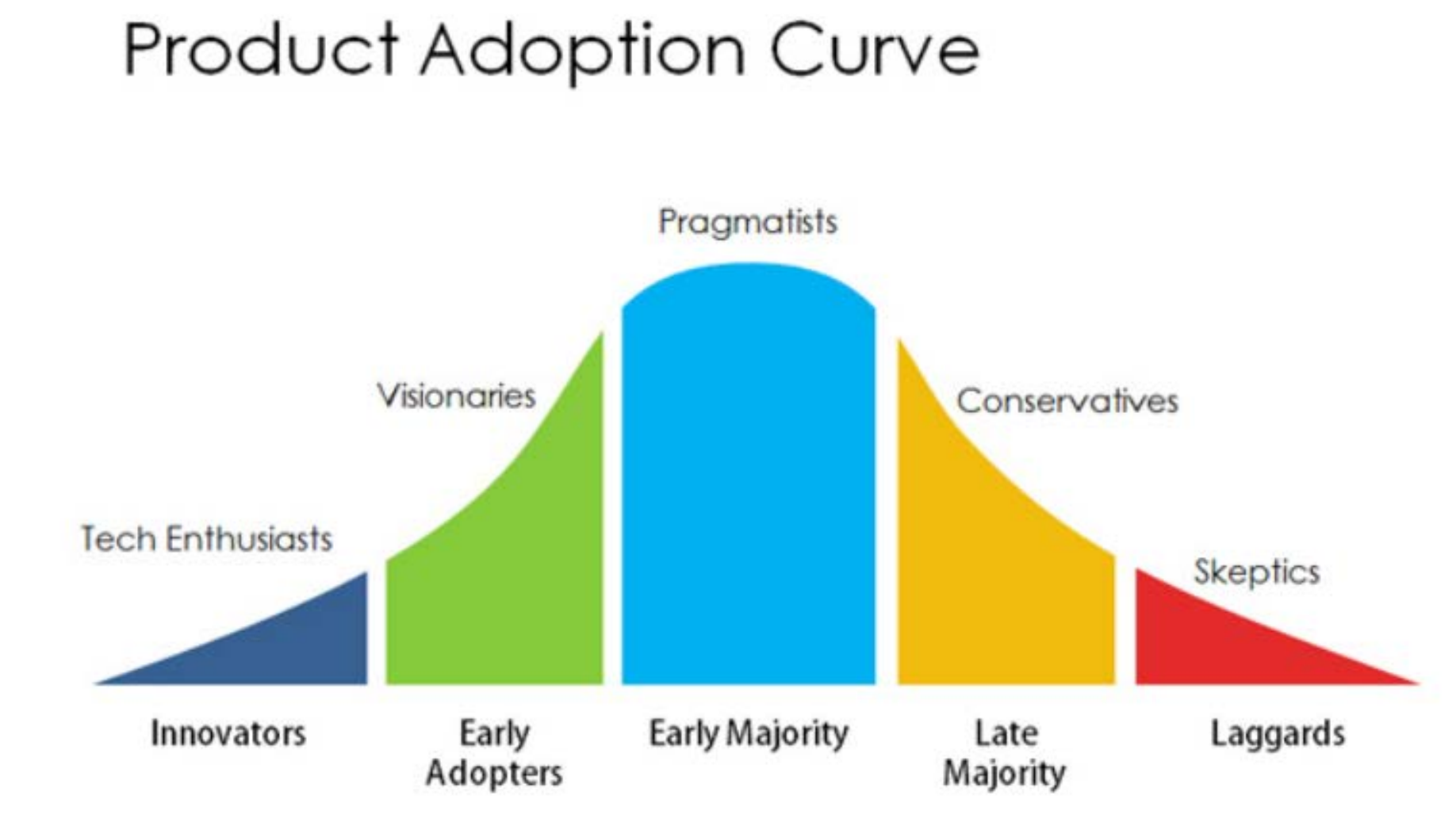
Irrigated corn planted April 20 into cover crop rye

picture taken 8/13/12

Irrigated corn planted April 20 into cover crop rye

picture taken 8/13/12

Control of Resistant Weeds



Irrigated corn planted into cover crop rye. pic taken 5/11/12

Cereal rye

- Contains benzoxazinone
- Very high nitrogen uptake and very slow nitrogen release

Cover Crop Impact on Following Spring Rotation to Soybeans

Spring Planted Oat Based Mix
Fallow Ground - Tribune, KS

Elbon Rye planted 9/20/15 Grazed early spring
Soybeans drilled May 20th

Elbon Rye planted 9/20/15 Grazed early spring
Soybeans drilled May 20th

Elbon Rye planted 9/20/15 Not grazed
Soybeans drilled May 20th

Elbon Rye planted 9/20/15 Not grazed
Soybeans drilled May 20th

Elbon Rye planted 9/20/15 Not grazed
Soybeans drilled May 20th Picture from 8/17

Elbon Rye planted 9/20/15 Not grazed
Soybeans drilled May 20th Picture from 8/17

Same field – end rows

Planter attachment to roll cereal rye when planting corn or beans - DawnBiologic

Planter attachment to roll cereal rye when planting corn or beans - DawnBiologic

Open the Window
As Much As Possible

- Spring planted covers may be an option if fall planted did not happen
  - Oats, peas, lentils, chickling vetch, rapeseed
  - Plant when soil temps hit 40
  - Herbicide option: spray out oats with Select ahead of corn and allow legumes to keep growing – spray out legumes with a post spray….

Open the Window As Much As Possible

- Interseeding or companion cropping into corn
- Biggest Challenges/Hurdles
  - RMA
  - Weed Control Issues
  - Nodulation of legumes
  - Lack of adequate sunlight

V4-V6 InterSeeding of Annual Ryegrass, Cereal Rye, Crimson Clover or Hairy Vetch

- Benefits
  - Relatively easy way to seed cover crop –
  - Plants can germinate and grow 4-6” and then go dormant when canopy closes
  - As corn dries down and canopy opens up, plants begin to grow again with cooler weather and sunlight
  - Better trafficability for fall harvest equipment
  - Can help with residue issues of corn on corn

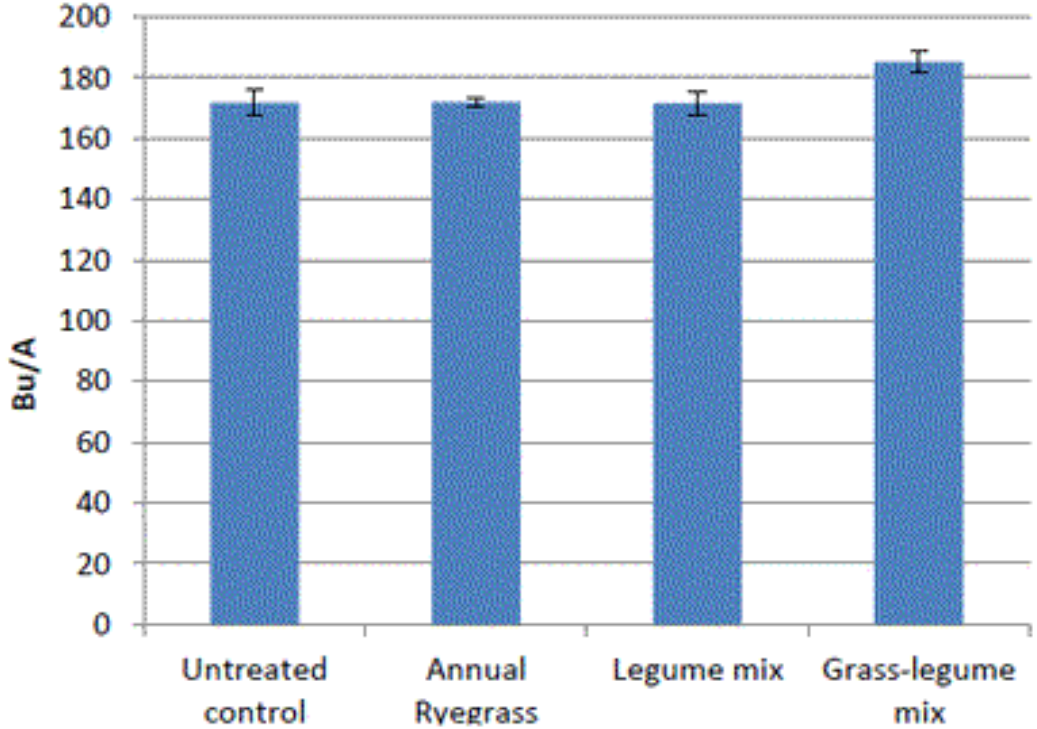
V4-V6 InterSeeding of Annual Ryegrass, Cereal Rye, Crimson Clover or Hairy Vetch

- Challenges
  - Weed control
    - Glyphosate burndown, post with broadleaf herbicides
    - BASF Verdict (16 oz/acre) working in Canada – applied preplant or pre-emerge
  - May disqualify for crop insurance programs
  - May fail in very dry years or when weather does not promote dormancy
  - Probably better fit further north….

Miller
Miller
NITRO 5240
GANDY

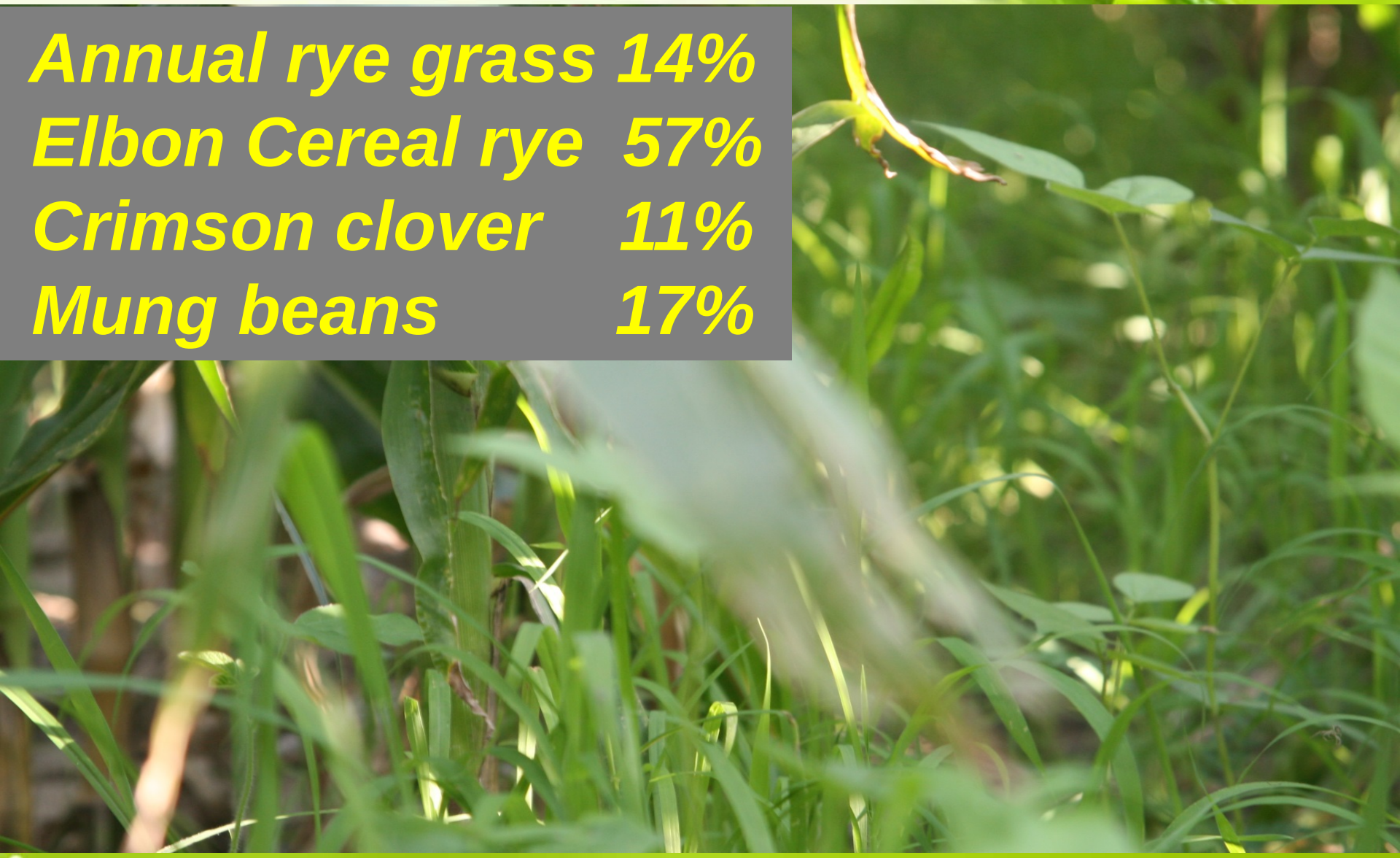
MT565

Figure 1. Impact of interseeding different species at V6 on corn grain yields at Rock Springs in 2013.



2013 Ryegrass at Corn Harvest in Rock Springs

V6-V8 Interseed into Corn North of Grand Island,NE



Annual rye grass	***14%***
Elbon Cereal rye	***57%***
Crimson clover	***11%***
Mung beans	***17%***

The real problem on most farms is Lack of Crop Diversity

Corn – Beans
Corn - Corn

There Is Great Power In Diversity!

- Natural systems have huge diversity
- Most of our cropping systems do not
- Cover crops should have as much diversity as practical

Weeds and diseases are nature's way of adding *diversity* to a system which lacks *diversity*.

Dr. Dwayne Beck

Nature's efforts to add diversity can be countered by adding *beneficial diversity* to the system.

Dr. Dwayne Beck

Most farmers will find it difficult to get enough diversity in their "cash crop" rotation….

Corn, Corn, Corn

Corn, Beans

Corn, Beans, Wheat

_____, _____, _____

Base Rotation

Corn

Fall Cover Crop

Cereal Rye, Hairy Vetch, Rapeseed

Beans

Peas

Vetch

Rye

Trit

Barley

Oats

Wheat

Summer Cover

Or

Double Crop of Sunflower or Buckwheat

So one of the best ways to introduce more diversity is through cover crop mixes….

Cover Crops are the perfect opportunity to have great plant diversity (above ground and below ground) without needing specialized *equipment*, *knowledge*, or *markets*.

Double Crop Sunflowers with Cover Companions

Goal: **Cash Crop, Soil Health, Grazing, Erosion Prevention**

***Timing*:** **Immediately after Cereal Harvest Late June – Late July**

***Species*:** **Hybrid Sunflowers (20-30K), mung beans, chick peas, vetch, lentils, crimson clover, peas, mustard, cabbage, buckwheat, flax**

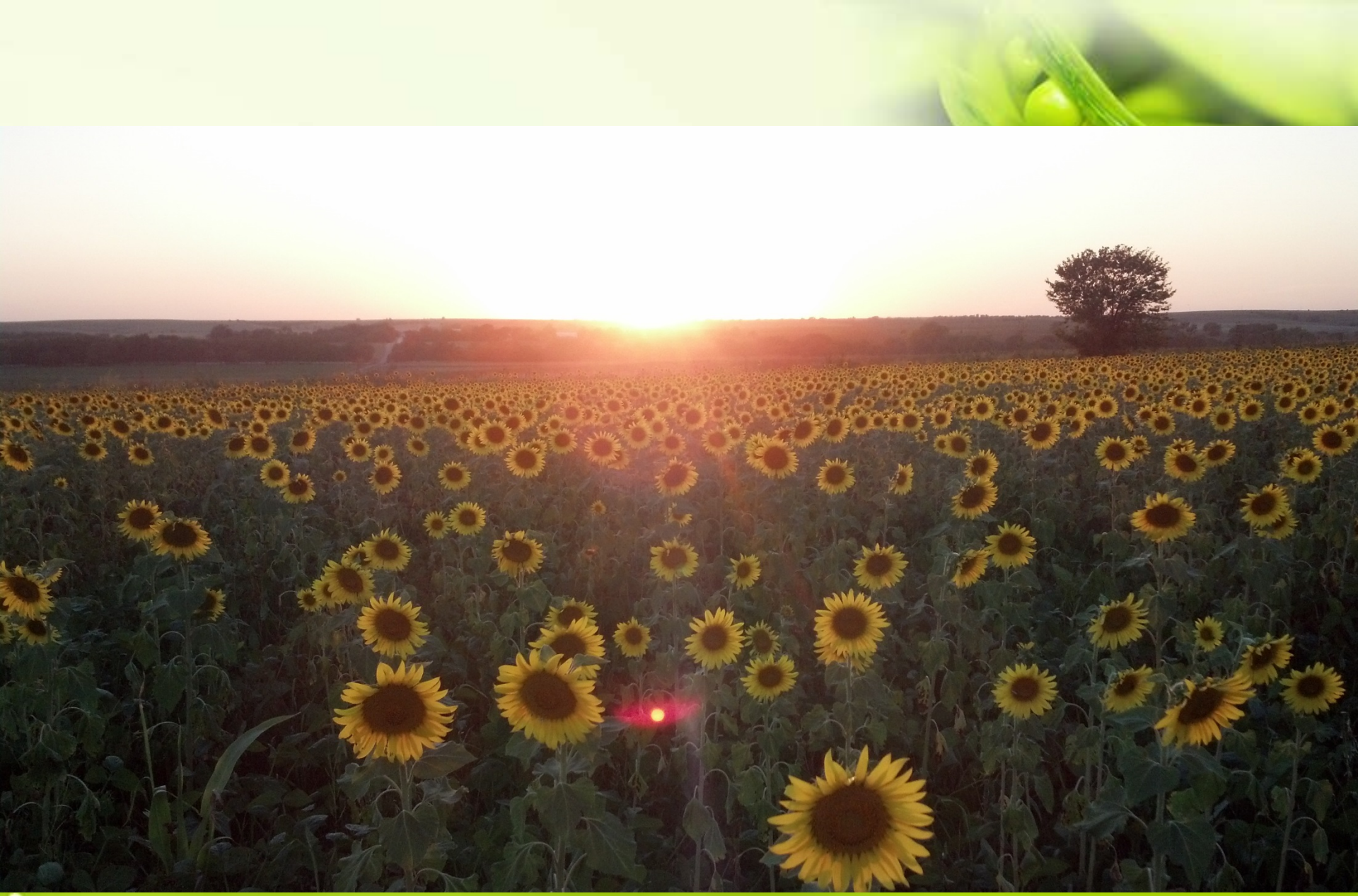
***Cost*:** **Flowers: $1 per 1,000 seeds**
Covers: $15 - $25/acre

***Concerns*:** **Growing season length, adequate moisture in dryland, marketing**

CROP DIVERSITY DRIVES SOIL BIOLOGY DIVERSITY

SOIL BIOLOGY DIVERSITY DRIVES THE SYSTEM

WE NOT ONLY HAVE PLANT DIVERSITY……WE ALSO HAVE INSECT



A Tale Of Two Fields

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