Cover Crops & Soil Health Opportunities

Iceberg or Tsunami?
Curious by nature

Inspired by challenges

Driven to learn and find answers
Acres of Potential...

Corn & Soybean
~163 Million Acres

This list
> 246 Million Acres

AG Census Total Farmland
> 805 Million Acres

...In the US alone

Vineyards/Grapes 1.1 million
Forage & Pastures 106 million
Corn for Silage 7.1 million
Vegetables 4.1 million
Sunflowers 3.5 million
Orchards 5.2 million
Sorghum 5.5 million
Cotton 9.3 million
Wheat 98 million
Beets 1.2 million
Pulse 2.8 million
Rice 2.6 million
Average Acres of Cover Crops Per Farm in the U.S.

Cover crop acres per farm – reported growth rate of about 15%
**Erosion Control**
**Increase Yield**
**Build Organic Matter**
**Alleviate Compaction**

**Sustainability**

**Goals / Benefits**

- Water Quality
- Water Infiltration
- Water Holding

- Creating Root Pathways
- Added Crop Rotations

- Improve Boggy Soils
- Nematode Control
- Reduce Labor Costs

- Nitrogen Fixation
- Phosphorous Management

- Nitrogen Stability
- Disease Suppression

- Increase Soil Temp
- Weed Suppression

- Decrease Soil Temp
- Increase Worm Activity

- Insect Control
- Deep Soil Potassium Access

- Improve Biology
- Beneficial Insectary

- Pollinator Habitat
- Mineral Uptake

- Improve Saline Soils
- Reduce Equipment Passes

- Control Chemical Leaching
- Disease Suppression

- Increase Microbial Activity
- Biofumigation

- Reduce Input Costs
- Increase Microbial Activity

- Improve Boggy Soils
- Biofumigation
A Few Tools...

CEREAL RYE (GRAIN)

RADISH

OATS

CEREALED RYE (GRAIN)

Sorghum

Winter Pea

Mustard

Sunflower

Sunhemp

Triticale

Nematode Control Radish

Buckwheat

Rocket

Fine Fescue

BARLEY

Phacelia

Annual Ryegrass

White Clover

Med Red Clover

Balansa Clover

Canola/Rape

Hybrid Clover

Common Vetch

Hairy Vetch

Chicory

Kale

Assorted Flowers

Millet

Wheat

Turnips

Fodder Beets

Camelina

Phacelia

Crimson Clover

Triticale

Radicchio

OATS

Annual Ryegrass

Persian Clover

Canola/Rape

Balansa Clover

Canola/Rape
Breeds of Cattle

ABERDEEN ANGUS  BEEF SHORTHORN  BELGIAN BLUE  BELTED GALLOWAY

BLONDE DAQUINA  BRITISH WHITE  CHIROLAS  HEREFORD

LINOSIN  LINCOLN RED  SOUTH DEVON  GALLOWAY

HIGHLAND  MURRAY GREY  RED POLL  SIMMENTAL

GLOUCESTER  DEXTER  AIRSHINE  LONGHORN

JERSEY  DEVON  IRISH MOLOSS  WELSH BLACK

DEXTER  WHITE PARK  HOLSTEIN  SUSSEX
A Clover is a Clover is a Clover...

CLOVER

ZigZag
Ball
Subterranean
Rose
NZ White

Crimson
Medium Red
Persian
White Dutch
Yellow Blossom
Berseem
Balansa
Grandiflorum

Southern Bur
Hop
Alsike
Button
Rabbits Foot
FIXation Balansa Clover
96,154 lbs. Green Biomass

Dixie Crimson Clover
5,162 lbs Green Biomass

University of Illinois
Ewing Demonstration Center
Evaluation of Cover Crops in Corn Production
Nitrogen in Biomass lbs./A.

- FIXatioN Balansa Clover: 269 lbs.
- Frosty Berseem Clover: 187 lbs.
- Kentucky Pride Crimson Clover: 52 lbs.
- Dixie Crimson Clover: 14 lbs.
<table>
<thead>
<tr>
<th>Species</th>
<th>Crop</th>
<th>Variety</th>
<th>Seeds/lb</th>
<th>Seeding Rate (PLS seeds/ft²)</th>
<th>Seeding Rate (PLS lb/ac)</th>
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<td><em>Avena strigosa</em></td>
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SOYBEAN CYST NEMATODE STUDY

SCN/Forage Legumes 2015

Trial established on 3/11/15 and inoculated with 2920 SCN eggs + 1860 J2s per cone.  
Trial terminated on 5/1/15. Plants destructively sampled and roots scrubbed to release SCN females.  
SCN population from Decatur MI, RR Trial 2014  
Soil: 88.3% sand, 6.7% silt and 5.0% clay; pH = 7.1; CEC = 3.9 meq/100 g  
Plant populations: alfalfa and clovers, 3 plants/cone; brassica, mustard and peas, 2 plants/cone and all others, 1 plant/cone.

<table>
<thead>
<tr>
<th>No.</th>
<th>Species</th>
<th>Cultivar</th>
<th>Rep 1 females</th>
<th>cysts</th>
<th>SUM eggs</th>
<th>Rep 2 females</th>
<th>cysts</th>
<th>SUM eggs</th>
<th>Rep 3 females</th>
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<th>SUM eggs</th>
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<td>1</td>
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<td>Foregrazer</td>
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<td>1</td>
<td>1</td>
<td>225</td>
<td>0</td>
<td>0</td>
<td>980</td>
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<td>0</td>
<td>0</td>
<td>0</td>
<td>390</td>
<td>0</td>
<td>0</td>
<td>505</td>
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<td>L455</td>
<td>0</td>
<td>1</td>
<td>1</td>
<td>10</td>
<td>0</td>
<td>0</td>
<td>15</td>
<td>0</td>
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SCN eggs^X  

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<tr>
<th></th>
<th>X</th>
<th>SD</th>
<th>SE</th>
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<td>1273.75</td>
<td>1032.371</td>
<td>258.093</td>
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<td>265.00</td>
<td>217.064</td>
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<tr>
<td>223.75</td>
<td>410.921</td>
<td>102.730</td>
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</table>
A Few Tools...

- CEREAL RYE (GRAIN)
- OATS
- RADISH
- Annual Ryegrass
- White Clover
- Med Red Clover
- Berseem Clover
- Persian Clover
- Canola/Rape
- Balansa Clover
- Hybrid Clover
- Common Vetch
- Hairy Vetch
- Camolina
- Nematode Control Radish
- Assorted Flowers
- Fodder Beets
- Pennycress
- Millet
- Turnips
- Sunflower
- Sunhemp
- Triticale
- Buckwheat
- Black Oats
- Chicory
- Rocket
- Fine Fescue
- Barley
- Kale
BREAK THE NEMATODE CYCLE

Novel solutions for growing concerns.

1. The female nematode creates a cyst full of eggs which can live dormant in the soil up to three years.
2. The eggs will not hatch until there is an available food source.
3. The Nematode Control Radish releases a chemical causing the eggs to hatch prematurely.
4. The nematode larvae are drawn to the radish as a perceived food source.
5. Image Nematode Control Radish provides no nutrition for the hungry nematodes.
6. The nematodes ultimately die of starvation, lacking the nutrients they need to survive.
COVER CROP SEED SALES

Specialize
Differentiate
Expand your network
Become the local Expert

LOCAL COVER CROP PLOTS

Observations
On-Farm Success Examples
Sharing/Learning
Highlight your related products/services

EQUIPMENT

Sales
Rentals
Options
EDUCATION
- Seminars
- Round-Table Discussions
- Crop Insurance
- Government Programs

CONSULTING
- On farm Rx
- Comprehensive Crop System Management
- Assist with Gov’t Programs
- Assist with Insurance Programs

EXPERTISE
- Value
- Connecting Dots
- Local Source for Information
- Community Trust
Where Farmers Want to Purchase Cover Crop Seed in the Future

- Cover Crop Seed Dealer: 43%
- Ag Retailer: 25%
- Another Farmer: 13%
- Commodity Seed Dealer: 8%
- Other: 10%

n = 1,392
Add a Slide Title

Goals / Benefits

INCREASE YIELD
- Improve Saline Soils
- Reduce Equipment Passes
- Increase Soil Temp

BUILD ORGANIC MATTER
- BUILD ORGANIC MATTER
- Alleviate Compaction

SUSTAINABILITY
- Control Chemical Leaching
- Improve Biology

Water Quality
- Water Infiltration
- Water Holding
- Creating Root Pathways

Nitrogen Fixation
- Added Crop Rotations
- Nematode Control
- Phosphorous Management

Nitrogen Stability
- Disease Suppression
- Weed Suppression
- Organic Insectary

Insect Control
- Deep Soil Potassium Access
- Mineral Uptake
- Reduce Equipment Passes

Increase Soil Temp
- Disease Suppression
- Weed Suppression

Decrease Soil Temp
- Beneficial Insectary
- Increase Worm Activity

Pollinator Habitat
- Weeds Suppression
- Improve Saline Soils

Improve Boggy Soils
- Improve Saline Soils
- Improve Microbial Activity

Phosphorous Management
- Nematode Control
- Phosphorous Management

Phosphorous Management
- Increase Worm Activity
- Biofumigation

Improved Biology
- Improved Boggy Soils
- Improved Microbial Activity

Reduce Input Costs
- Increase Microbial Activity
- Biofumigation

Reducing Labor Costs
CRIMSON CLOVER
VARIETY: KENTUCKY PRIDE
LOT: M9-16-KCC-166

PURE SEED: 99.83%
OTHER CROP SEED: 0.00%
INERT MATTER: 0.17%
WEED SEED: 0.00%
NOXIOUS WEEDS: NONE FOUND
GERMINATION: 81.00%
HARD SEED: 9.00%
TOTAL GERMINATION: 90.00%
TEST DATE: 9/16
ORIGIN: OREGON
NET WEIGHT: 50LB/22.68KG

GREENER WORLD SEED COMPANY
123 MAIN STREET
HARTLAND USA
AMS 4804
The local Ag Retailer’s pricelist offers Dixie Crimson clover at $1.80/lb. and FIXatioN Balansa Clover at $2.60/lb. WOW! Seems like an easy decision if you only look at things from a cost-per-pound perspective. But let’s take a little deeper look:

<table>
<thead>
<tr>
<th>Dixie Crimson</th>
<th>FIXatioN Balansa Clover</th>
</tr>
</thead>
<tbody>
<tr>
<td>~135,000 seeds per pound (raw)</td>
<td>~500,000 seeds per pound (coated)</td>
</tr>
<tr>
<td>Plant rate = up to 20 lbs/A. (drilled)</td>
<td>Plant rate = up to 8 lbs/A. (drilled)</td>
</tr>
<tr>
<td>The cost per acre = $36</td>
<td>The cost per acre = $20.80</td>
</tr>
</tbody>
</table>

Cost per acre provides a clearer picture of your real cost.
REQUESTED BY SOIL CONSERVATIONISTS ACROSS THE NORTH AMERICA

'I reviewed the booklet and am very impressed.'
Joe – USDA-NRCS, IL

'This is a fabulous resource!'
Molly - MSU Extension, MT

'Wow, nice product.'
Joel – Resource Conservationist, CO

'I looked at the book and found it wonderful!'
Kefeni, PhD
USDA-NRCS, PA

'They are so clear and easy to understand – they will be a great help to our large and small farmers alike.'
Allison - Coordinator Water Programs, AL
You can’t stop the waves
But you can learn to surf!
Grassland Oregon
Novel solutions for growing concerns.

Risa DeMasi - @SeedNerd
Grassland Oregon - @GOSeed
www.GrasslandOregon.com