No-till and Cover Crops on Pennsylvania Dairy

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Soil slopes up to 15% , note the large field size compared to local farms and the lack of terraces, waterways and rill erosion control measures required under continuous tillage practices of neighboring farms.

Dec 7, 2013

Cereal Rye/ Triticale and Crimson Clover Mixture for cover and forage production

Planted:
Sept 21,2013

Photo:
Dec 7,2013

Multi-species cover crop planted after rye…photo taken after 1st frost in November

Same field as last slide in May the following spring…Corn planted into regrowth of multi-species cover crop planted after rye for grain harvest the year before…yielded 154 bu/acre corn in 2013…historically this field has struggled to make 100 bu corn in corn/soybean rotation

Rye/Triticale ready for harvest 3rd week in May

One pass corn after corn for grain the previous year…cover crop rye is no till established after corn harvest, in spring corn is planted into green cover crop and sprayed once with burndown plus corn pre-emergnece herbicide. Fields are scouted at corn emergence to check for insect activity…about 1 year in 5 there are some armyworms that warrant insecticide control. Broadcast applications of insurance insecticide and fungicide must be avoided if soil health is to be achieved.

Corn harvest continues at a rapid rate once corn maturity is reached. Note Magnum with drill attached and filled with seed. It is critical that cover crop planting keeps up with harvest…in this way…rain does not delay cover seeding, seeding is done in optimum conditions and seeding does not delay manure applications after the field is finished.

Other successful crop options: 60 day crop of Peas and Oats planting around snow piles in March can be harvested for forage and successfully double cropped to corn without yield penalty and improves soil health.

Soybeans planted into rye cover crop terminated late.

Wheat seeded in September into alfalfa stands increases yield and quality and doesn't hurt legume stand and possibly improves it by suppressing weeds.

Cover crop of rye following corn for grain will be either soybeans or corn.


Cover crops need not be terminated in advance of crop seeding date…this maximizes the cover crop advantages.


Same field 3 weeks later

Cover crop of rye following soybean harvest will be corn or alfalfa seeding.

Multi-species cover crop following rye for grain

The same field just before frost

Same field while soil testing after frost…note tillage radish are still growing after frost.

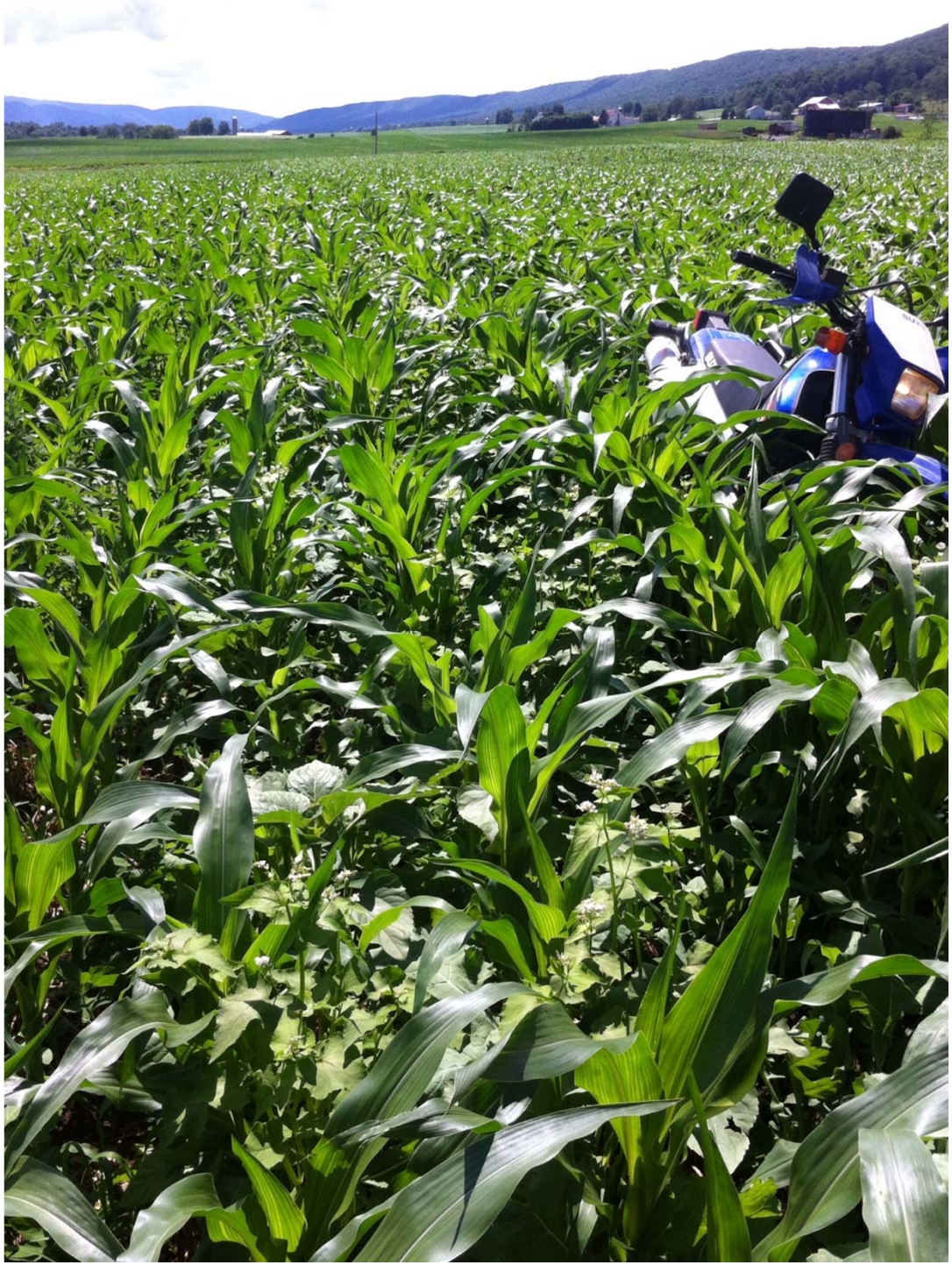
Narrow strip…sod strip above…are we really on the right tract with current Ag E&S? How effective is this approved plan at protecting soil and water?

Not all Ag E&S plans protect water quality…soil health and microbiological filters are real solutions to improving water quality.

Picture after a rain…either side of a hard road same soils but different management

Cover crop following tobacco under continuous tillage…water doesn't soak in and will likely erode

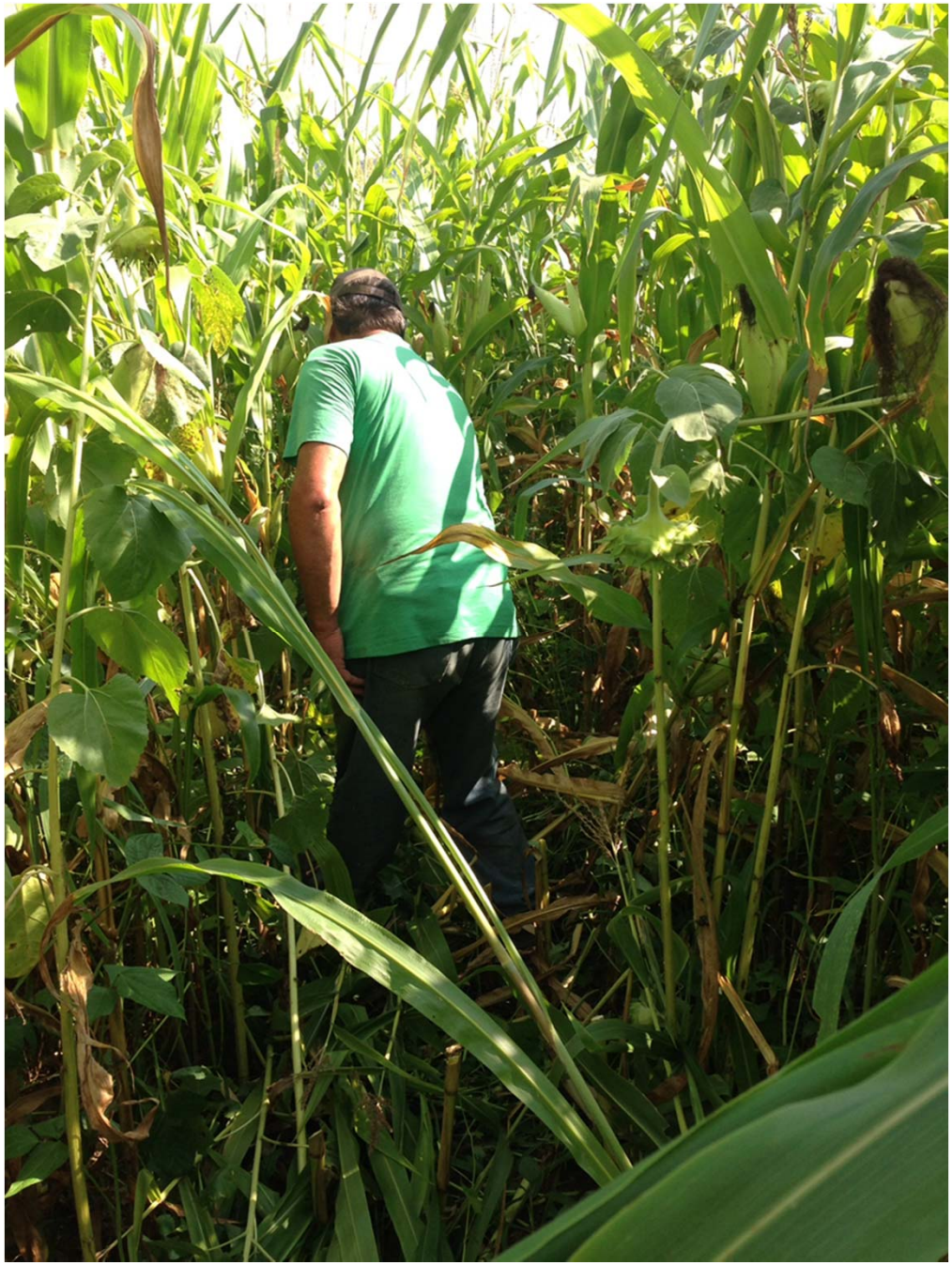
Cover crop following corn silage under continuous no-tillage…water soaks in completely



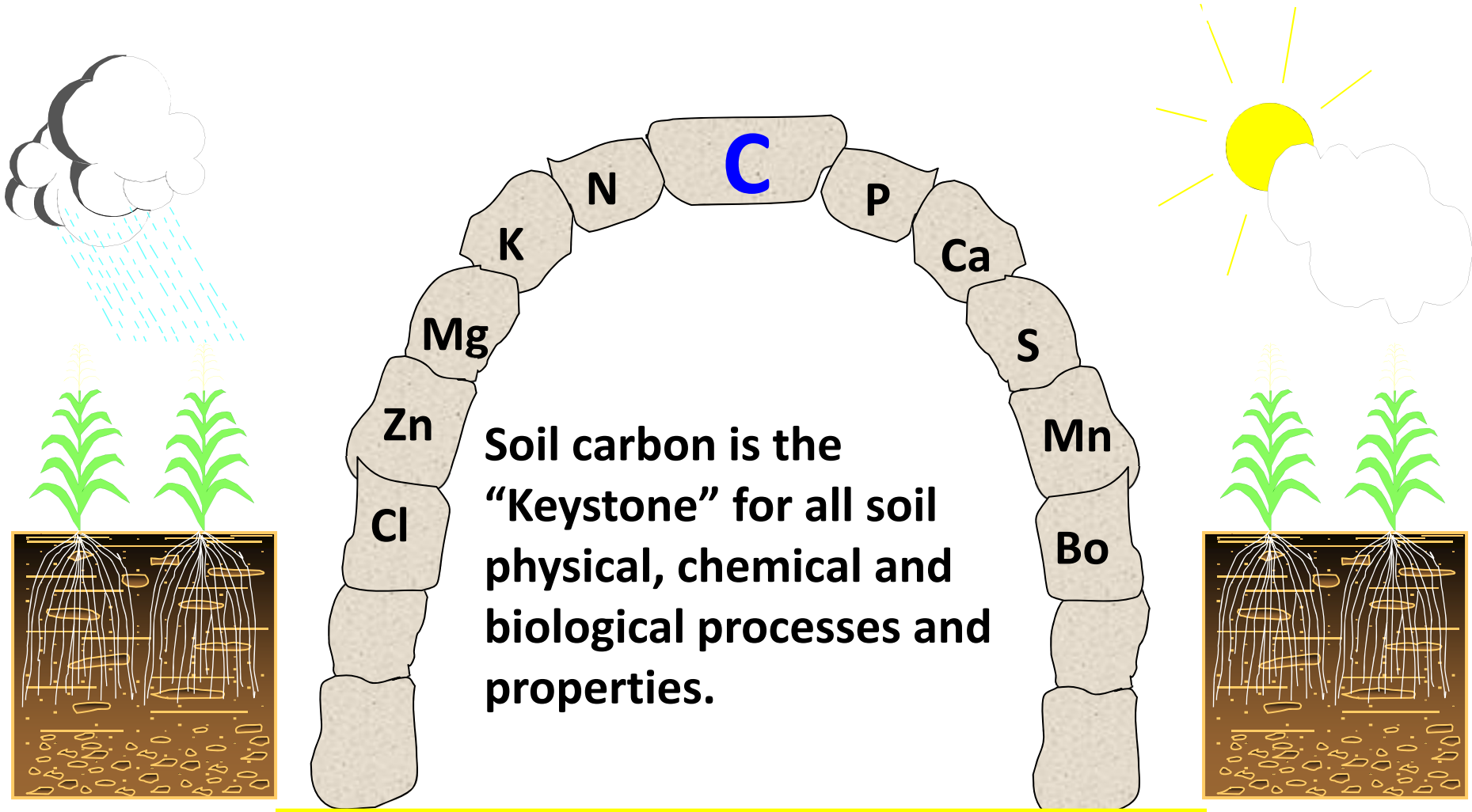
Eight way companion crop planted with corn.

Corn was planted at 31,000 ppa, drilled 8 way mixture in 15 inch rows immediately afterward and included

- 11# Non GMO Soybeans
- 3# Persian Clover
- 4# BMR Forage Sorghum
- 2# Graza Fodder Radish
- 2# Sunflower
- 2# Buckwheat
- 2# Canola
- 2# Impact Forage Collard



Preparing a walkway through very thick forage for a field day.



Management platform

Dr. D.C. Reicosky, ARS, Morris, MN.

The current logic: Most soil-related problems can be dealt with by increasing external inputs

Problem	Current Treatment	Reality
Soil erosion	Contour strips, buffer strips, grass waterways	Water is not infiltrating
Soil compaction	Mechanical treatment with plow or subsoiler equipment	Loss of soil structure
Nutrient deficiency	Add fertilizer	Lack of organic matter Loss of biological nutrients
Pest and diseases	Insecticides, fungicides, herbicides	Lack of diversity, loss of natural predators
Drought stress, lack of water	Irrigation, prayer	Water is not infiltrating Lack of organic matter Confined root systems
Water pollution	Regulations	Healthy soils are a biological filter for water


The Soil Livestock is a complex and diverse mix of species and represents the greatest concentration of biomass of anywhere on the planet.

How Do We Treat the Land?

This soil is naked, hungry, thirsty and running a fever!

Ray Archuleta 2007

Nature’s residue managers

Important points to remember

- Photosynthesis fixes carbon…the key to building soil organic matter
- Food quality and plant health is a function of soil health
- Most microbes are aerobic (need air and water), tilled soils lack the porosity to support such life

Cover Crops

- Seed cover crops as soon as possible or mother nature will
- A weed is mother natures 1st line of defense
- Cover Crops are not a cost… they are an investment
- No-till + Diversity + Cover crops = Soil Health

Healthy Soil Advantages

- There is only one pest for every 1700 beneficial insects, 22% of these eat weed seeds
- Granivores include at least 180 species of ground beetles, ants, crickets, isopods, millipedes, caterpillars and weevils.
- Insecticide applications and seed treatments have been shown to kill 85% of these beneficial insects.

- What are you feeding your micro and macro biology and what habitat are you providing?
- What are you doing to harvest all the sunlight that comes to your farm?

If you think you can or you think you can’t you are likely right.

If you think you can you’re half way there!