

# 20 years of experience with green manures

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## On our farm

- Maximizing life in soil with green manure and minimizing interventions.
- Studied cases :
  - Intercropping in corn and sunflower
  - Summer fallow
  - Underseeding cover crop in cereals



# Results

- Very strong root system
- Compaction reduction during harvest
- Good biomass in spring
- Many earthworms during row cultivation
- Regrows in spring sometime difficult to control (flowers too early)
- Cultivar research to be done



# **Related problems**

- Sometime difficult to cultivate
- Dry down interrows
- Seed production of raygrass and regrows
- Stain soybean at harvest



# Intercropping clover in sunflower

- Clover established during ridge forming pass
- Very aggresive in spring
- Competition for water , nutrients and light between clover and crop (delayed control related to rain)
- Nitrogen availability is too late
- This technique is very soil and climate dependant

## nnovation!

# Corn yield after sunflower interseeded with clover

Years	clover type	bu/ac No manure	bu/ac manure
2007	White	124.8	126
2008	Red Light soil Heavy clay soil	126	128 88
2009	red	94.4	73.6

# Since 2010

- Corn has been replaced by soybean in sunflower ridges
- No more need for clover (nitrogen and white mold relation)
- Replaced by ryegrass

# Summer fallow experiences

- Common vetch for seeds (replaced by forage peas 40-10)
- High yields of corn the year after
- Very sensitive to diseases in wet years
- Expensive seed difficult to harvest
- Good control of annual weeds but not on perennials (seeded too early)
- Good regrowth in fall



# Corn yields following common vetch (no manure applied)

Bu/ac	Corn field	Corn strips (120 ft) Heavy clay
2005	148	
2006	157	
2007	151	143
2008	136	126
2009	129	128
2010	152	120

#### Intelligent fallow

Keep clover in wheat stubble until end of May the year after cereal

Chop clover

Offset disk and cultivation until mid august

Seeding of forage peas

Good perennial weed control



# Underseeded clover (or alfalfa) in wheat

- Seeded at pre-emergence of wheat with a tine weeder
- "single cut" red clover (4.4lb/ac) mixed with 2.6lb/ac white clover
- Destroyed in November with a scalper



## Corn yield following clover (or alfalfa)

year	Preceding crop	no manure	manure
		bu/ac	
2005	wheat/alfafa	128	135,04
2006	wheat/alfafa	148	150,88
2007	wheat/alfafa	144	153,6
2008	wheat/clover	107,2	108,8
2009	wheat/clover	102,4	
2010	wheat/clover	126,4	137,6
2015	wheat/clover	171,2	173,6
2016	wheat/clover	145,6	148,8
2016	wheat/clover	133	135
	wheat/alfafa	128	137,6

# Technique from Manfred Wenz

- Spring destruction of clover (2 in working depth)
- Don't wake up weeds
- Respect of rhizobium and microbial life
- Soil protected through winter



# **Modified technique**

- Fall destruction of clover (November)
- Efficient in fuel and maintenance
- Scalper : 0.85gal/ac (8 L/ha), moldboard plow : 2.1 gal/ac (20 L/ha) ,disks :1.3gal/ac (12 L/ha)

# Results since 2011

• Year	corn/clover	corn/clover
•	bu/ac	disk + peas
• 2011	128	
• 2012	125	
• 2013	80	
• 2014	104	
• 2015	168	
• 2016		145
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# Green manure trends (2015-2017)

- Following wheat harvest with or w/o underseeded clover
- Direct seeding forage peas into clover or disking and seeding of peas
- Offset disk or scalping or plowing in november

## Co-cropping wheat and peas

- Goal: Improve protein level in wheat
- Drill wheat and peas together
- 60lbs/acre soup peas (Meadow) + 140 lbs/ac wheat (Walton)

## Protein level with/without manure



# Conclusion

- No organic production without green manure
- Be careful with the methods you use
- Green manure and minimum tillage is still a challenge
- Having living plants all year around and green manure is our next goal and challenge

## Nitrogen: energy required

- urea : 25 gal diesel equivalent/100 lb
- Ammonia : 20 gal diesel/100 lb
- P<sub>2</sub>O<sub>5</sub> : 5,4 gal diesel/100 lb
- K<sub>2</sub>O : 5,5 gal diesel /100 lb
- 150 50 50 : 42,9 gal diesel/acre
- Glyphosate : 12 litres/kg (1.43 gal/lbs) I.A.
- Manufacture, transport and application included

#### A mind is like a parachute It works better when it is opened

Thank you



# Conference Thomas Dewavrin

Question period



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