

Building a No-Till System In Tune With The Soil

David Chance
Chance Farms
January 17, 2014





**22nd Annual
National
No-Tillage
Conference**

Springfield, Ill. • Jan. 15-18, 2014
An Honest No-Till Education





**22nd Annual
National
No-Tillage
Conference**

Springfield, Ill. • Jan. 15-18, 2014
An Honest No-Till Education





Chance Farms Established 1993



**A Healthy Soil System Is
A Harmonic Balance
Between The Physical,
Chemical And Biological
Properties Of The Soil
And Is Only As Strong As
It's Weakest Link**



Ideal Physical Properties of Soil

- 25 % Air
- 25 % Water
- 45 % Balanced Minerals
- 5 % Organic Matter





**22nd Annual
National
No-Tillage
Conference**

Springfield, Ill. • Jan. 15-18, 2014
An Honest No-Till Education



System Drain Tile Installation Is Our Initial Step In Managing Air and Water Balance In The Soil



**22nd Annual
National
No-Tillage
Conference**

Springfield, Ill. • Jan. 15-18, 2014
An Honest No-Till Education



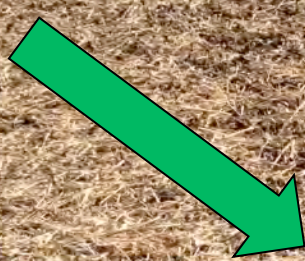
Hardpan Compaction Relief Using a No-Till In-Line Ripper Is An Additional Step in Managing Air And Water Balance In The Soil



Had A Cover Crop Light Bulb Moment By Accident In 2006 And Have Been Addicted Every Since



Vertical Compaction Caused By Wheel Tracks From Large Farm Equipment



Soil Aerobic Zone Aeration With Minimal Soil Inversion Is A Key Step In Reducing Nutrient Stratification And Providing A Favorable Aerobic Environment For Beneficial Microbes To Thrive While Maintaining Crop Residues and Soil Structural Integrity



Aerator Is Planting A Cover Crop That Will Occupy The Compaction Free Aerobic Zone With Dense Root Masses, Recycling Nutrients And Stimulating Beneficial Microbial Populations



Conventional Tillage Field During a Large Rain Event



**22nd Annual
National
No-Tillage
Conference**

Springfield, Ill. • Jan. 15-18, 2014
An Honest No-Till Education



No-Till Corn on Corn Field with Terminated Cereal Rye Cover Crop During Same Rain Event



Nutrition

The Foundation For Nutrient Dense Foods

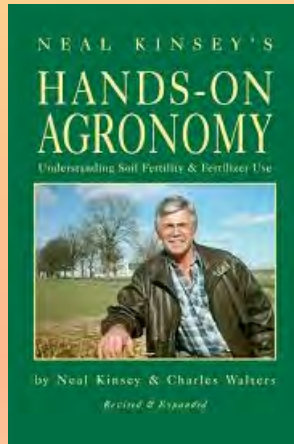
FUEL

“You are What You Eat”

Nutrition is a foundation of our health, and proper nutrition is required for the best athletic performance. Nutrition is “fuel”. We must eat quality meals to gain energy, burn fat, and to maximize athletic performance. Just like putting bad “fuel” into a gas tank - if we feed our bodies junk, we will probably feel like junk, perform like junk, and eventually the junk will get the best of us.



Excellent Resources Teaching Dr. William Albrecht 's Principles of Optimum Soil Mineral Balance



Feed The Soil and Let The Soil Feed The Plants and Let The Plants Feed The People and Livestock



The Optimum Chemical Soil Balance

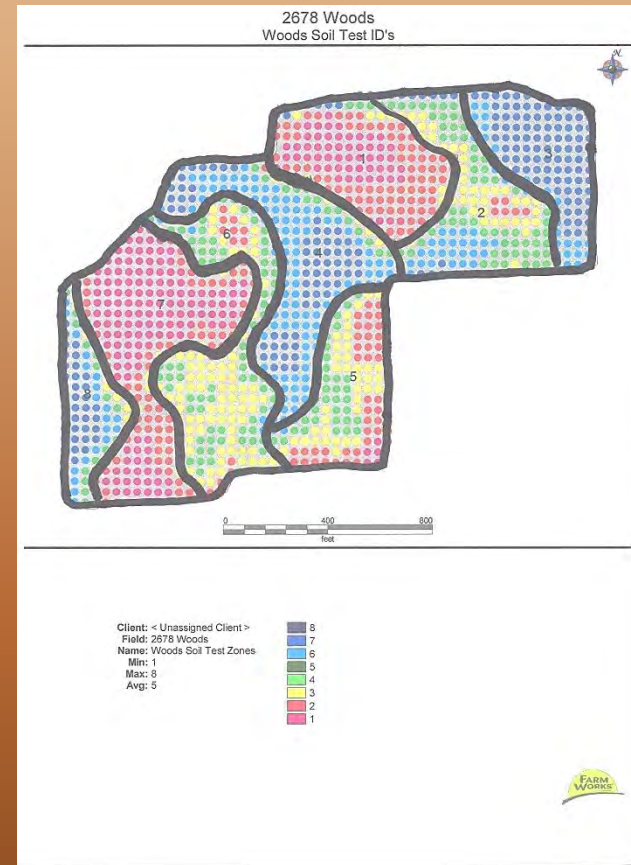
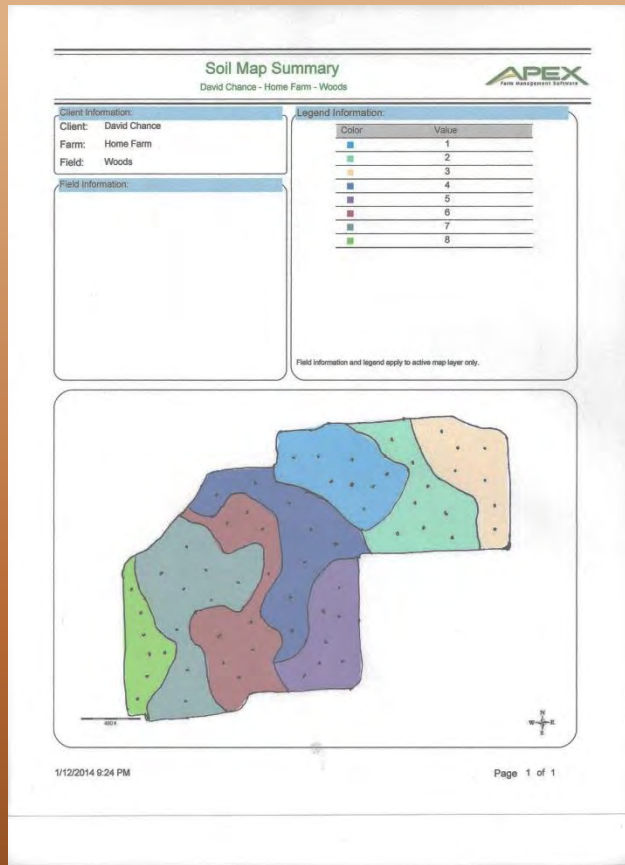
using Dr. William Albrecht's Soil Principles
with testing procedures done at
Perry Agricultural Labs using North County
Ag-Gro Consulting

- ▣ Total Exchange Capacity between 10 – 30 TEC
- ▣ Organic Matter levels between 3 – 7 %
- ▣ Calcium Saturation of 68 % - 72 %
- ▣ Magnesium Saturation of 11 % - 14 %
- ▣ Potassium Saturation between 3 – 5 %
- ▣ Sodium Saturation 1% or less
- ▣ Other Minor Bases 5 – 6%
- ▣ Hydrogen 10%
- ▣ Water PH 6.4 – 6.6

The Optimum Chemical Soil Balance Continued

- ▣ Phosphorus using the Bray P2 extract expressed in lbs./acre of P2O5 between 320 lbs. – 500 lbs. / acre
- ▣ Soluble Sulfur at 21 – 50 ppm
- ▣ Boron at 1 – 2.5 ppm
- ▣ Iron at 200 ppm or greater
- ▣ Manganese at 60 – 100 ppm
- ▣ Zinc at 7 ppm – 11 ppm in a proper ratio with elemental phosphorus
- ▣ Copper at 3.5 ppm – 5.5 ppm in a proper ratio with Zinc

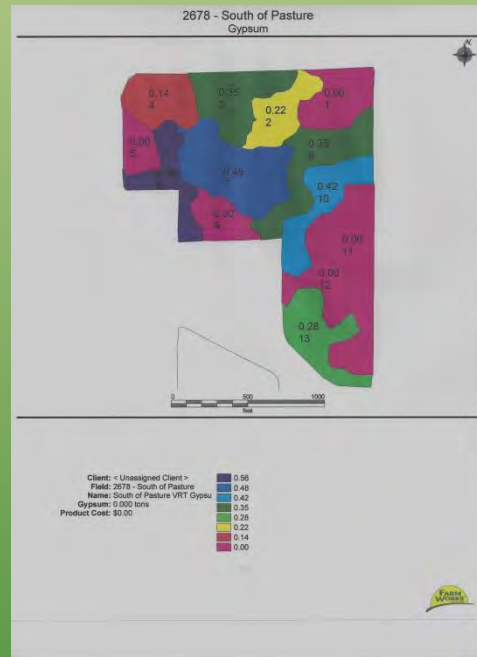
Soil Test are taken every 2 years in management zones based on Veris EC readings



Soil Amendments are based on Soil Test results and are applied with VRT technology to help achieve good soil mineral balance

PROFESSIONAL SOIL REPORT						
Account of		DAVID CHANCE			Address	
Service Representative		NORTH COUNTY AG-GRO			Date: 7/12/2013	
(260) 238-3299						
Field	CARSON	1	1	1	1	1
Sample		1	2	3	4	5
Lab No.		E0064	E0065	E0066	E0067	E0068
Total Exchange Capacity (M. E.)		15.76	18.93	15.62	18.96	13.25
pH of Soil Sample		6.00	6.80	6.20	6.30	6.60
Organic Matter, Percent		2.00	2.30	2.00	2.10	1.60
ANIONS	NITROGEN: lbs / acre	60	66	60	62	52
	SULFATE - S: p.p.m.	30	16	27	22	28
	PHOSPHATES: Desired Value as (P2 O5)	244	247	244	247	242
	Value Found lbs / acre Deficit	263 -19 -30	300 -53 -30	204 -40 -30	344 -97 -30	212 -30 -30
EXCHANGEABLE CATIONS	CALCIUM: Desired Value lbs / acre Value Found Deficit	4285 3773 -512	5148 5521 -373	4248 3928 -320	5157 4988 -169	3603 3615 -12
	MAGNESIUM: Desired Value lbs / acre Value Found Deficit	453 544 -91	545 726 -181	449 591 -142	546 727 -181	381 515 -134
	POTASSIUM: Desired Value lbs / acre Value Found Deficit	460 454 -6	519 363 -156	458 316 -142	520 420 -100	406 332 -74
	SODIUM: lbs / acre	120	91	113	99	96
BASE SATURATION PERCENT						
Calcium (60 to 70%)		59.86	72.92	62.87	64.45	69.22
Magnesium (10 to 20%)		14.39	15.98	15.77	15.98	16.20
Potassium (2 to 5 %)		3.69	2.46	2.59	2.84	3.21
Sodium (5 to 3%)		1.96	1.05	1.57	1.14	1.58
Other Bases (Variable)		5.40	4.50	5.20	5.10	4.88
EXCHANGEABLE HYDROGEN (10 to 15%)		15.00	3.00	12.00	10.50	6.00
Salinity 1:2 EC (dS/M)						
Chlorides (p.p.m.)						
Boron (p.p.m.)						
Iron (p.p.m.)						
Manganese (p.p.m.)						
Copper (p.p.m.)						
Zinc (p.p.m.)						

VRT Gypsum Prescription Map Based on Soil Test Results



Soil Amendments used on our Farm to Achieve Optimum Soil Balance

- High Calcium Limestone
- Gypsum
- Potassium Sulfate 0-0-50-17S
- Ammonium Sulfate 21-0-0-24S
- MAP 11-52-0
- Zinc Sulfate 35.5%
- Granubor 14.3% - Boron
- Copper Sulfate 23%
- K-Mag 0-0-22-11Mg-22S
- Liquid Hog Manure
- Compost



The Composting Operation Our Latest Venture



Compost Windrow Construction



Fresh Green Chop Addition During Windrow Construction



Ag Recycle, a local composting operation aerating and inoculating a newly constructed windrow



Composting Highlights

- Finished Compost product takes between 16 – 20 weeks to mature
- Spread between 1 – 8 tons / acre based on the soil mineral needs and cropping requirements
- Finished Compost Product is rich in Organic Nitrogen, Phosphorus, Sulfur, Calcium, Magnesium, Zinc, Copper, Organic Matter and Diverse Beneficial Microbial Populations



A Healthy Soil Biological System That Is Active And Diverse Is What Bridges the Physical and Chemical Properties Of The Soil Together



The Complex Marriage Relationship Between The Physical, Chemical And Biological Properties Of The Soil Is What Has Led Our Farm On The Journey Of Using Cover Crops





Springfield, Ill. • Jan. 15-18, 2014
An Honest No-Till Education





**22nd Annual
National
No-Tillage
Conference**

Springfield, Ill. • Jan. 15-18, 2014
An Honest No-Till Education





**22nd Annual
National
No-Tillage
Conference**

Springfield, Ill. • Jan. 15-18, 2014
An Honest No-Till Education





**22nd Annual
National
No-Tillage
Conference**

Springfield, Ill. • Jan. 15-18, 2014
An Honest No-Till Education







**22nd Annual
National
No-Tillage
Conference**

Springfield, Ill. • Jan. 15-18, 2014
An Honest No-Till Education





**22nd Annual
National
No-Tillage
Conference**

Springfield, Ill. • Jan. 15-18, 2014
An Honest No-Till Education





**22nd Annual
National
No-Tillage
Conference**

Springfield, Ill. • Jan. 15-18, 2014
An Honest No-Till Education





**22nd Annual
National
No-Tillage
Conference**

Springfield, Ill. • Jan. 15-18, 2014
An Honest No-Till Education





**22nd Annual
National
No-Tillage
Conference**

Springfield, Ill. • Jan. 15-18, 2014
An Honest No-Till Education





**22nd Annual
National
No-Tillage
Conference**

Springfield, Ill. • Jan. 15-18, 2014
An Honest No-Till Education





**22nd Annual
National
No-Tillage
Conference**

Springfield, Ill. • Jan. 15-18, 2014
An Honest No-Till Education





**22nd Annual
National
No-Tillage
Conference**

Springfield, Ill. • Jan. 15-18, 2014
An Honest No-Till Education





**22nd Annual
National
No-Tillage
Conference**

Springfield, Ill. • Jan. 15-18, 2014
An Honest No-Till Education





**22nd Annual
National
No-Tillage
Conference**

Springfield, Ill. • Jan. 15-18, 2014
An Honest No-Till Education





**22nd Annual
National
No-Tillage
Conference**

Springfield, Ill. • Jan. 15-18, 2014
An Honest No-Till Education





**22nd Annual
National
No-Tillage
Conference**

Springfield, Ill. • Jan. 15-18, 2014
An Honest No-Till Education





**22nd Annual
National
No-Tillage
Conference**

Springfield, Ill. • Jan. 15-18, 2014
An Honest No-Till Education





Springfield, Ill. • Jan. 15-18, 2014
An Honest No-Till Education





**22nd Annual
National
No-Tillage
Conference**

Springfield, Ill. • Jan. 15-18, 2014
An Honest No-Till Education





**22nd Annual
National
No-Tillage
Conference**

Springfield, Ill. • Jan. 15-18, 2014
An Honest No-Till Education





**22nd Annual
National
No-Tillage
Conference**

Springfield, Ill. • Jan. 15-18, 2014
An Honest No-Till Education





**22nd Annual
National
No-Tillage
Conference**

Springfield, Ill. • Jan. 15-18, 2014
An Honest No-Till Education





**22nd Annual
National
No-Tillage
Conference**

Springfield, Ill. • Jan. 15-18, 2014
An Honest No-Till Education





**22nd Annual
National
No-Tillage
Conference**

Springfield, Ill. • Jan. 15-18, 2014
An Honest No-Till Education





The Combination
of
System Drain Tile,
Compaction Relief,
Limited Tillage,
Soil Mineral Balance
And
Cover Crops
Lead to a Biologically Active,
Healthy, Balanced Physical Soil
Environment
Where Plants can Thrive!

Thanks!

