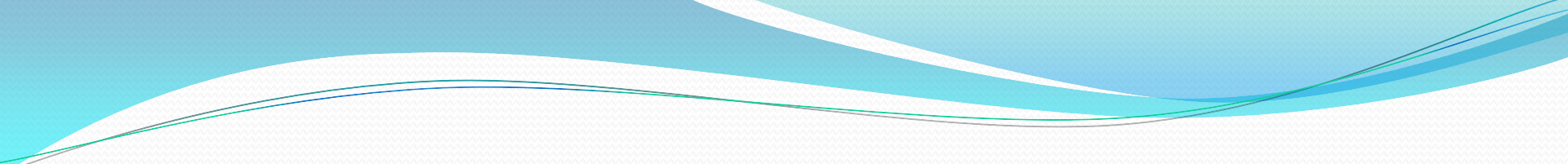
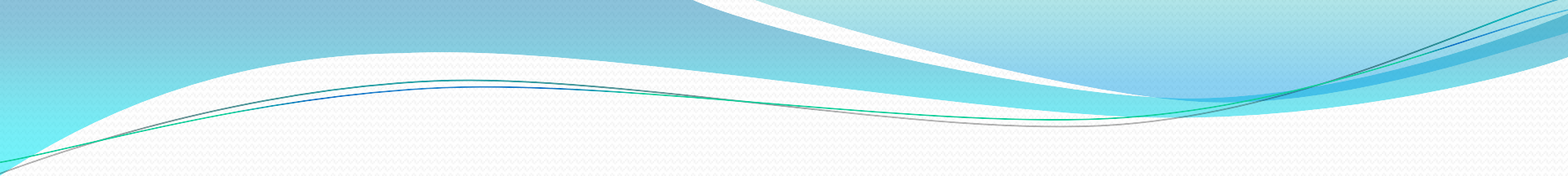


# Alternative Methods of Determining Soil Productivity (Which is Best?)

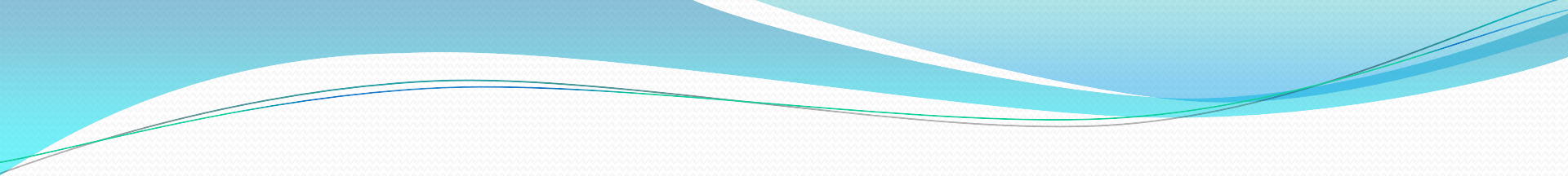
Rick Hauge, ARA  
Rick Hauge's Land & Appraisal Co.



Why worry about CER's,  
Corn Productivity, and  
CPI when estimating  
the value of a property?



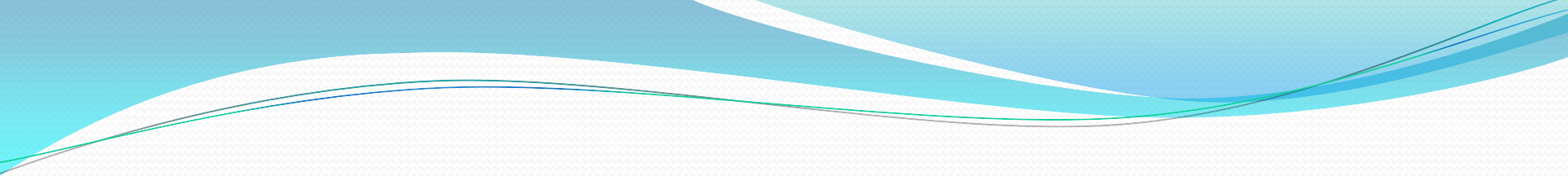
The mark of a “Good Appraiser” is the ability to measure differences.



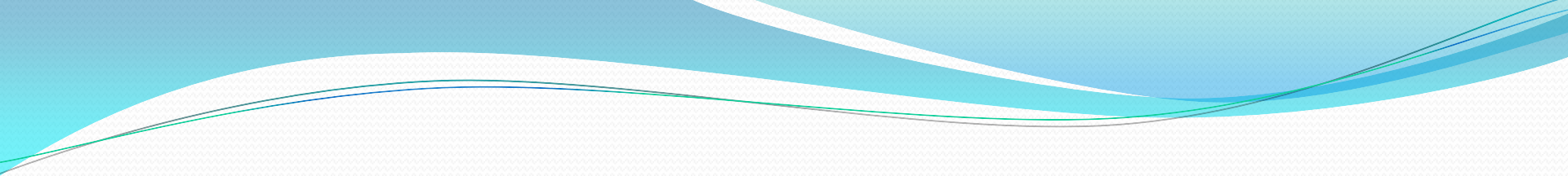
In the Sales Comparison Approach, adjustments are made to the comparable sales to arrive at a final value estimate.

# Differences to Measure

- Time
- Field Arrangement
- Wood Lands
- Wind Towers
- Drainage Outlets
- Sale Terms
- Building Site Values
- Abandoned Building Site
- Access
- Mineral Rights
- Productivity
- Recreational Lands



Most adjustments can  
only be calculated  
after we adjust for  
land productivity.



How productivity is  
measured depends  
on the quality of  
these adjustments.

## 3 Methods to Measure Productivity

- Crop Equivalency Rate (CER)
- Corn Productivity
- Crop Productivity Index (CPI)



# CER-Estimate of Net Earning Capacity of a Soil

- One of the first tools appraisers had to measure productivity differences between soils.
- Developed by Dr. Richard Rust, U of M Soil Scientist.
- Index rating soils on a scale of 0 to 100.
- Problems:
  - Not a real uniform rating between soils
  - Not a uniform rating system between counties
  - Very subjective-each county had own rating index

# Corn Productivity (Yields)

- Still Subjective
- More Uniform
- Good only County by County

# CPI – Crop Productivity Index

- More uniform rating between soils
- Uniform between counties
- Very objective – developed by NRCS soil scientists based on soils physical and chemical properties and how these relate to crop production.



**Renville County Comparison  
Same Soils  
Three Different Index Values**

### Nicollet vs Harps

Soil Name	CPI	CER	Corn Bushels
Nicollet	99	90	154
Harps	90	61	132
Percent Difference	91%	68%	86%

### Nicollet vs Webster

Soil Name	CPI	CER	Corn Bushels
Nicollet	99	90	154
Webster	93	77	148
Percent Difference	94%	84%	96%

### Nicollet vs Harps-Seaforth-Okoboji

Soil Name	CPI	CER	Corn Bushels
Nicollet	99	90	154
Harps-Seaforth-Okoboji	90	58	138
Percent Difference	91%	83%	90%



# Analysis of a Renville County Sale Using All Three Indexes

## SALE #1

This sale occurred on October 31, 2012 and is located two miles northeast of Renville, MN. The farm was 155 acres in size with 150.5 tillable acres. There is a designated wetland that did not negatively affect value. The farm had random tile with good outlets. The farm sold at sealed bid auction with active bidding.

**Land Use Breakdown: Using CPI (90 CPI/Till acre @ \$127.98/CPI)**

<b>0 acres Class I cropland @ \$0 per acre =</b>	<b>\$0</b>
<b>29 acres Class IIe cropland @ \$12,225 per acre =</b>	<b>\$354,525</b>
<b>100.5 acres Class IIw cropland @ \$11,427.61 per acre =</b>	<b>\$1,148,475</b>
<b>21 acres Class IIIw cropland @ \$11,000 per acre =</b>	<b>\$231,000</b>
<b>4.5 acres Road &amp; Waste @ \$-0- per acre =</b>	<b>\$-0-</b>
<b>Total Sale Price</b>	<b>\$1,734,000</b>



**Land Use Breakdown: Using CER (66 CER/Till acre @ \$182.66/CER)**

<b>0 acres Class I cropland @ \$0 per acre =</b>	<b>\$0</b>
<b>29 acres Class IIe cropland @ \$14,775 per acre =</b>	<b>\$428,475</b>
<b>100.5 acres Class IIw cropland @ \$10,852.69 per acre =</b>	<b>\$1,090,695</b>
<b>21 acres Class IIIw cropland @ \$10,230 per acre =</b>	<b>\$214,830</b>
<b>4.5 acres Road &amp; Waste @ \$-0- per acre =</b>	<b>\$-0-</b>
<b>Total Sale Price</b>	<b>\$1,734,000</b>

**Land Use Breakdown: Using Corn Productivity (135 bu. /Till acre @ \$85.48/CPI)**

<b>0 acres Class I cropland @ \$0 per acre =</b>	<b>\$0</b>
<b>29 acres Class IIe cropland @ \$12,700 per acre =</b>	<b>\$368,300</b>
<b>100.5 acres Class IIw cropland @ \$11,231 per acre =</b>	<b>\$1,128,715</b>
<b>21 acres Class IIIw cropland @ \$11,285 per acre =</b>	<b>\$236,985</b>
<b>4.5 acres Road &amp; Waste @ \$-0- per acre =</b>	<b>\$-0-</b>
<b>Total Sale Price</b>	<b>\$1,734,000</b>

Comp #		1		Subje CER	
0 ac. Class I @	\$0 equals	\$0	126 @	\$15,365 equals	\$1,935,990
29 ac. Class II @	\$14,775 equals	\$428,475	25 @	\$14,775 equals	\$369,375
0 ac. Class IIIe @	\$0 equals	\$0	9 @	\$10,190 equals	\$91,710
100.5 ac. Class IIw @	\$10,853 equals	\$1,090,695	102.1 @	\$10,853 equals	\$1,108,060
21 ac. Class IIIw @	\$10,230 equals	\$214,830	58 @	\$10,230 equals	\$593,340
0 ac. CRP @	\$0 equals	\$0	0 @	\$0 equals	\$0
0 ac. Farmsite @	\$0 equals	\$0	0 @	\$0 equals	\$0
4.5 ac. Road @	equals	\$0	1.62 @	\$0 equals	\$0
155 Total Farm Ac.	\$11,187	\$1,734,000	321.72	\$12,739	\$4,098,475
Difference:		\$1,552			
Comp #		1		Subje Corn Bu.	
0 ac. Class I @	\$0 equals	\$0	126 @	\$12,850 equals	\$1,619,100
29 ac. Class II @	\$12,700 equals	\$368,300	25 @	\$12,700 equals	\$317,500
0 ac. Class IIIe @	\$0 equals	\$0	9 @	\$10,685 equals	\$96,165
100.5 ac. Class IIw @	\$11,231 equals	\$1,128,715	102.1 @	\$11,231 equals	\$1,146,685
21 ac. Class IIIw @	\$11,285 equals	\$236,985	58 @	\$11,285 equals	\$654,530
ac. CRP @	\$0 equals	\$0	0 @	\$0 equals	\$0
0 ac. Farmsite @	\$0 equals	\$0	0 @	\$0 equals	\$0
4.5 ac. Road @	equals	\$0	1.62 @	\$0 equals	\$0
155	\$11,187	\$1,734,000	321.72	\$11,917	\$3,833,980
Difference:		\$730			
Comp #		1		Subje CPI	
0 ac. Class I @	\$0 equals	\$0	126 @	\$12,370 equals	\$1,558,620
29 ac. Class II @	\$12,225 equals	\$354,525	25 @	\$12,225 equals	\$305,625
0 ac. Class IIIe @	\$0 equals	\$0	9 @	\$10,240 equals	\$92,160
100.5 ac. Class IIw @	\$11,428 equals	\$1,148,475	102.1 @	\$11,428 equals	\$1,166,759
21 ac. Class IIIw @	\$11,000 equals	\$231,000	58 @	\$11,000 equals	\$638,000
0 ac. CRP @	\$0 equals	\$0	0 @	\$0 equals	\$0
0 ac. Farmsite @	\$0 equals	\$0	0 @	\$0 equals	\$0
4.5 ac. Road @	\$0 equals	\$0	1.62 @	\$0 equals	\$0
155	\$11,187	\$1,734,000	321.72	\$11,691	\$3,761,164
Difference:		\$504			

**ESTIMATED MARKET VALUE OF SAME FARM USING THREE ANALYSIS METHODS:**

	<b>PER ACRE</b>	<b>TOTAL VALUE</b>
<b>CER METHOD</b>	<b>\$12,739</b>	<b>\$4,098,475</b>
<b>CORN PRODUCTIVITY METHOD</b>	<b>\$11,917</b>	<b>\$3,833,980</b>
<b>CPI METHOD</b>	<b>\$11,691</b>	<b>\$3,761,164</b>

## SALE #2

40 Acres of land sold in the fall of 2012. There were 37.6 tillable acres, a good drainage outlet and good field arrangement. The farm sold for \$404,000 or \$10,745 per tillable acre.

## SALE SUMMARY

<b>Soil Name</b>	<b>CPI</b>	<b>CER</b>	<b>Corn Bu.</b>
<b>Seaforth</b>	<b>95</b>	<b>86</b>	<b>149</b>
<b>Harps</b>	<b>90</b>	<b>61</b>	<b>132</b>
<b>Okoboji</b>	<b>86</b>	<b>56</b>	<b>132</b>
<b>Sale Price/Unit</b>	<b>\$120.71</b>	<b>\$167.70</b>	<b>\$79.08</b>

### **CPI Method of Sale Analysis**

<b>8.6 ac. Class IIe @ \$11,465/ac. =</b>	<b>\$98,599</b>
<b>9 ac. Class IIw @ \$10,865/ac. =</b>	<b>\$97,785</b>
<b>20 ac. Class IIIw @ \$10,381/ac. =</b>	<b>\$207,616</b>

### **CER Method of Sale Analysis**

<b>8.6 ac. Class IIe @ \$14,425/ac. =</b>	<b>\$124,055</b>
<b>9 ac. Class IIw @ \$10,220/ac. =</b>	<b>\$91,890</b>
<b>20 ac. Class IIIw @ \$9,398/ac. =</b>	<b>\$187,965</b>

### **Corn Bu. Method of Sale Analysis**

<b>8.6 ac. Class IIe @ \$11,780/ac. =</b>	<b>\$101,308</b>
<b>9 ac. Class IIw @ \$10,440/ac. =</b>	<b>\$93,960</b>
<b>20 ac. Class IIIw @ \$10,287/ac. =</b>	<b>\$205,732</b>