Topic #1

- Saving Diesel Fuel Without Tillage on the Farm

Diesel Savings on Farms in the Palouse Area of Eastern Washington & No. ID

- Land Area 3.4 million acres cropland
- Crops grown with tillage 1.9 mil acres
- 55% of the area
- Crops grown without tillage 1.5 mil acres
- 45% of the area
- Crops are grain, peas, lentils, canola, barley
- Crops are not irrigated

Estimated Diesel Fuel Used With and Without Tillage

- Crop System With Full Tillage: 6 gallons/acre/ year
- Crop System Without Tillage:2.5gallons /acre/ year
- Reduction in annual fuel useage per year: 41%
- Agricultural diesel suppliers acknowledge reduced fuel useage due to no tillage

Changes in Diesel Fuel Useage
On 3.4 million acres

- Diesel useage before farming without tillage

  20.4 million gallons per year <1980
- Diesel useage farming now without tillage
- On 45%, or 1.5 million acres

  11.23 million gallons per year now
- Diesel fuel savings now versus 1980

  9.17 million gallons per year now

How is this reduction in diesel fuel possible?

- With full tillage and 6.0 gallons per acre per year
- Crops are grown with 4 to 10 tillage trips
- Without tillage and 2.5 gallons per acre per year
- Crops are grown with 1 or 2 tillage trips

Why are not all of the 3.4 million acres growing crops without tillage?

- Paradigm shift
- Investment in different seeding equipment
- Three to five year transition
- Risk of crop yield reduction in the transition
- Adding crops to rotate with wheat
- Change in control of pests

Why are crops grown without tillage?

- Reduced soil erosion by wind and water
- Balancing farm workload
- Savings of fuel, labor, and machine costs
- Improving soil structure
- Time for family or other values

What will cause the change to crops without tillage?

- Assistance to get started:
- On-farm research
- Test fields
- Go-to technical people for answers
- Capital for different seeding equipment
- Cooperation by farming partners: owners, investors, employees
- Opportunities to meet with peers

Topic #2

- Savings of Nitrogen Fertilizer and Natural Gas

Fertilizing Farm Fields by Management Areas in the Palouse

- Traditional Fertilizing Method: One nitrogen rate in the 80 acre field
- Variable Fertilizing Method: Nitrogen rates each acre, or few acres in the 80 acre field

How is this done?

- The 80 acre field is divided into a grid
- Example is 80 cells, one cell for each acre
- Soil is sampled for moisture and carry over
- Yield potential is determined for each cell
- Nitrogen need is determined for each cell
- Global positioning equipment is used to apply nitrogen at a different rate in each cell in the field

Research Reference
University of Idaho

- A spacially variable nitrogen fertilizer rate application system was developed by U of I in 1992.
- Field was 80 acres near Steptoe, WA north of Pullman, WA in Whitman County.
- A spacially variable nitrogen rate control system was developed.
- Field was typical of the 3.4 acres of Palouse

Preliminary Conclusions

- Using the spatially variable fertilizer rate application system, the fertilizer rate was reduced by 25 percent of the rate that the farmer used traditionally.
- The wheat yield of 62 bushels /acre was in the range of 60 to 63 bushels per acre the farmer received in the previous 4 years using his traditional nitrogen rate per acre.
- Rate of Traditional N:71 lbs/acre
- Savings: 17 lbs/acre

Nitrogen Fertilizer Savings
3.4 million acres

- Savings of 17 lbs/acre over 3.4 mil acres of the Palouse would be 57.8 million lbs. of nitrogen
- Most nitrogen fertilizer in the Palouse is made from natural gas
- Savings of 57.8 million lbs. of nitrogen would be a reduction of 1178.12 million cubic feet of natural gas in the 3.4 million acres of the Palouse

Summary

- Growing crops without tillage in the Palouse could reduce diesel fuel use by 9.17 million gallons per year over use with full tillage in 1980.

Summary

- Fertilizing crops in cells smaller than a field with GPS could reduce the nitrogen fertilizer need by 25%.
- A reduction of 25% in nitrogen fertilizer use could reduce natural gas needed to create the fertilizer by 1178.12 million cubic feet per year.