




# 1

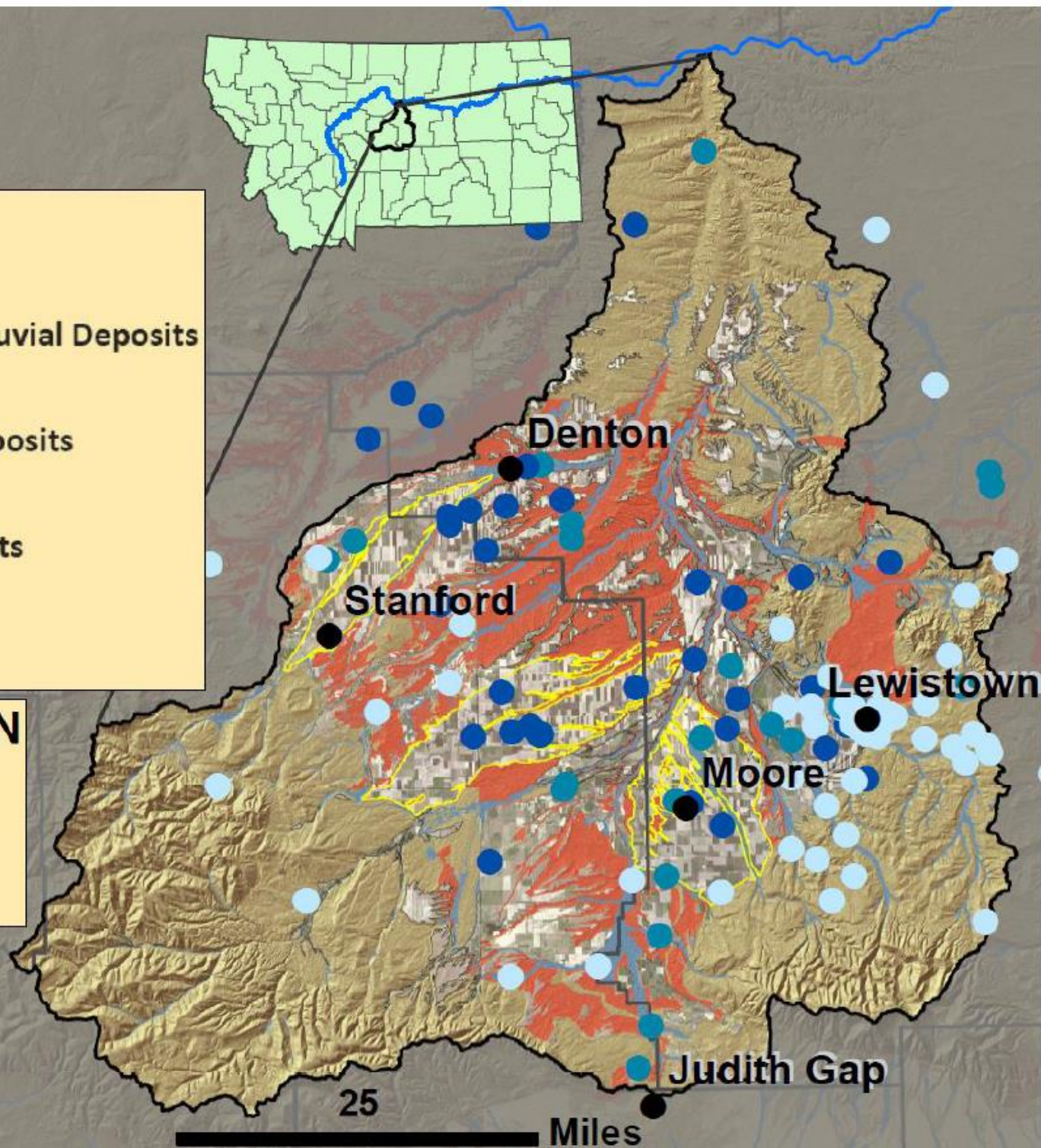
-  Judith Watershed
-  Missouri River
-  Streams & Modern Alluvial Deposits
-  Landform Boundary
-  Quaternary Gravel Deposits
-  Cretaceous Age Shale
-  Older Marine Sediments
-  Towns
-  County Boundary

## Groundwater Nitrate-N

-  0 - 2 (mg/L)
-  3 - 10 (mg/L)
-  11 - 51 (mg/L)



Map: Adam Sigler, 6/11/2014  
Data: MBMG, Landsat8, USGS, MSU



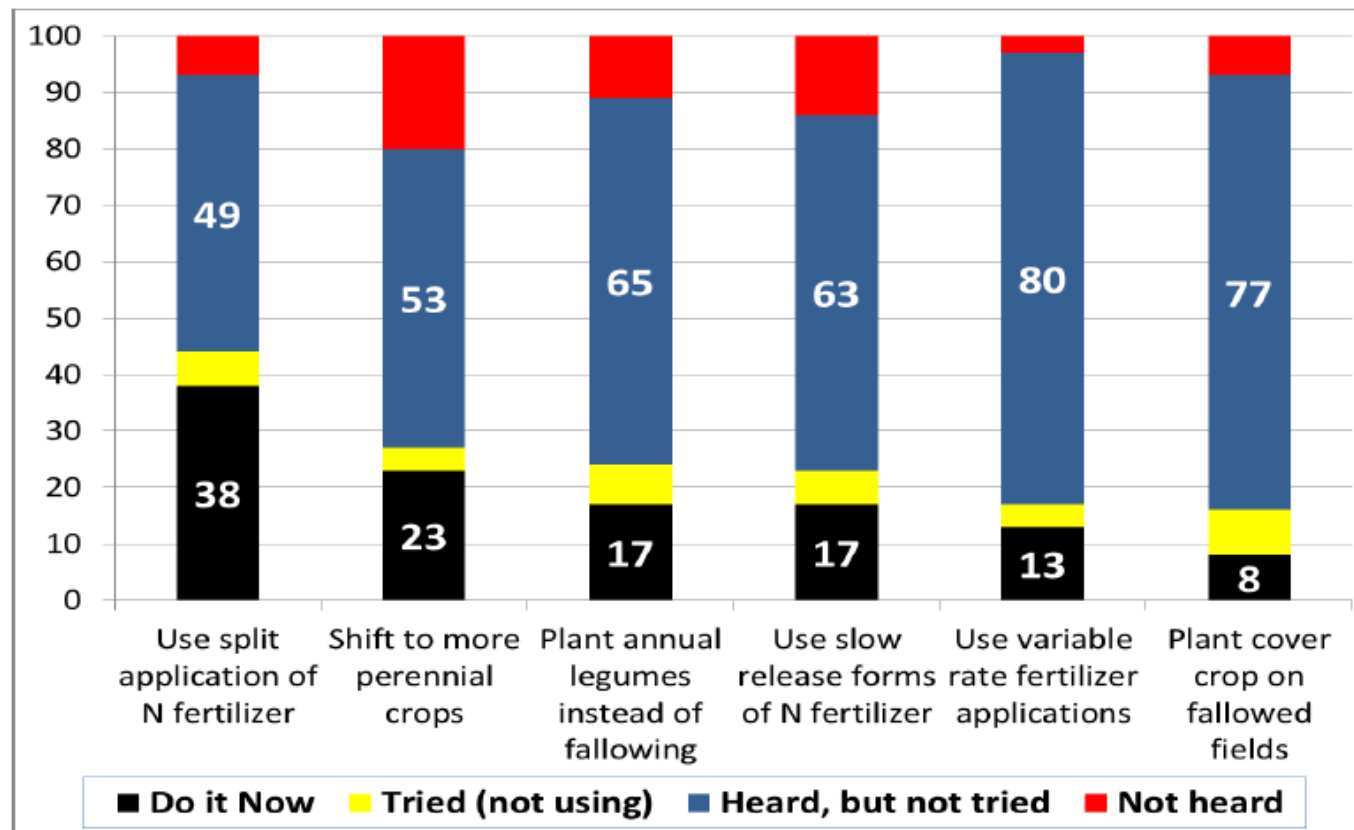
# 2

## Project Goals

1. Identify and quantify sources of nitrate in groundwater
2. Evaluate practices that reduce leaching and are feasible
3. Engage the local farming community in the research

## What Practices Do Farmers Use?

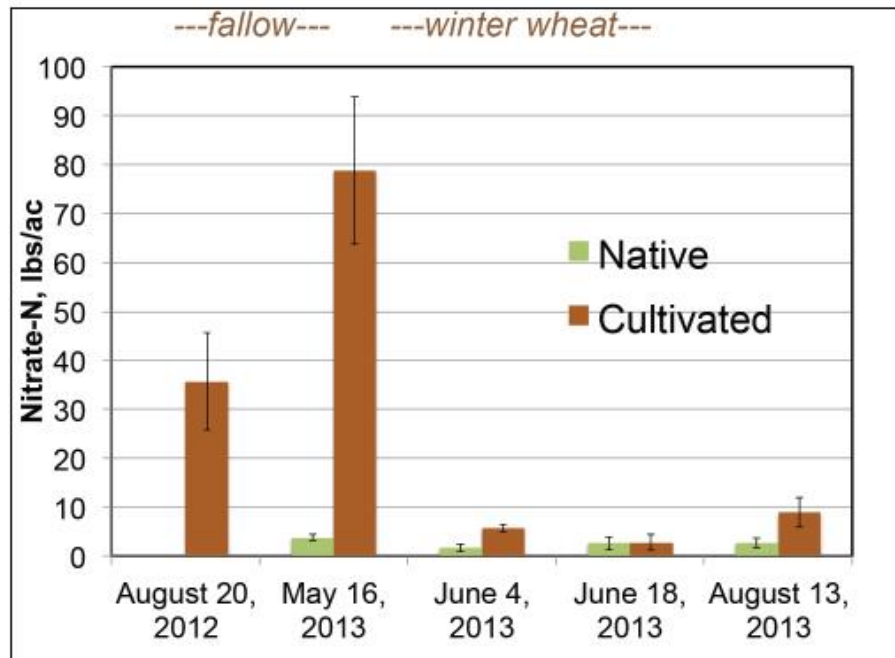
*(2012 survey results)*





# 3

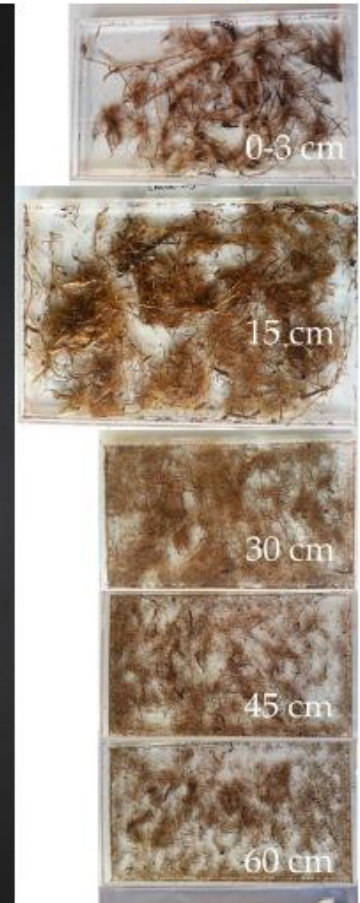
## Non-Sources – native range



Wheat roots



Native Range roots



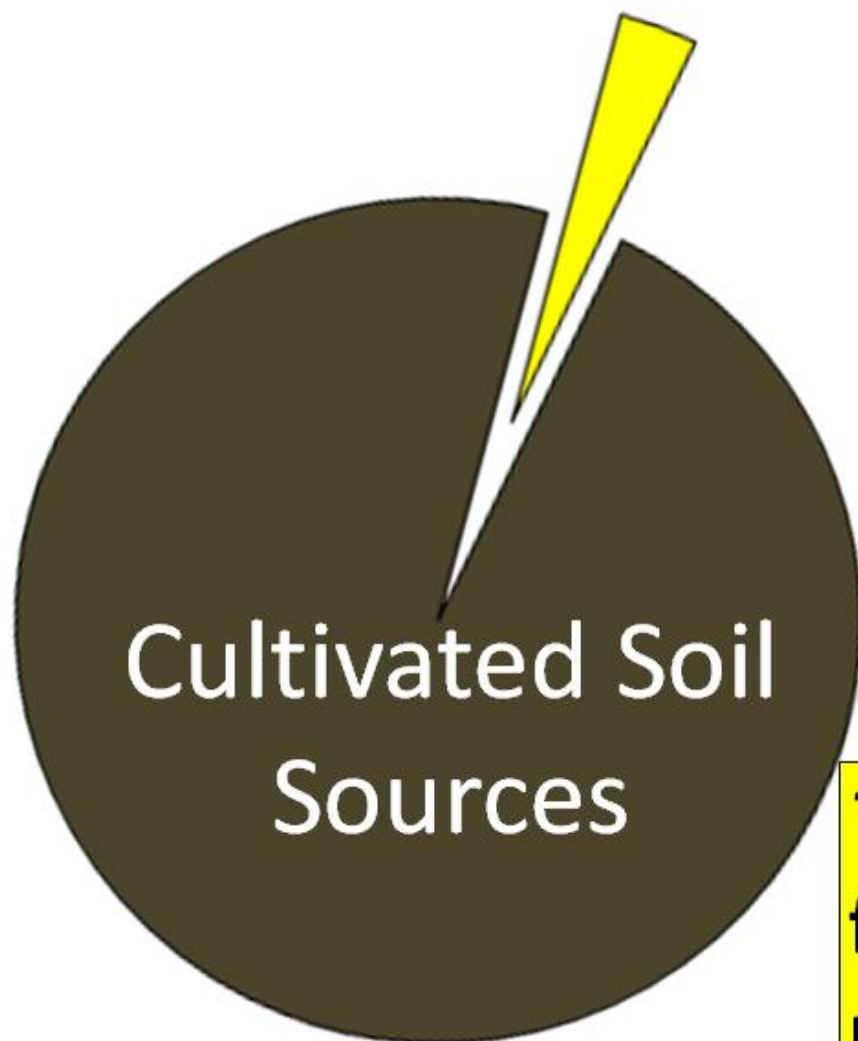
***Take home:*** Not much nitrate available for loss in native range



# 4

## Non-Sources – Shale

Shale Sources



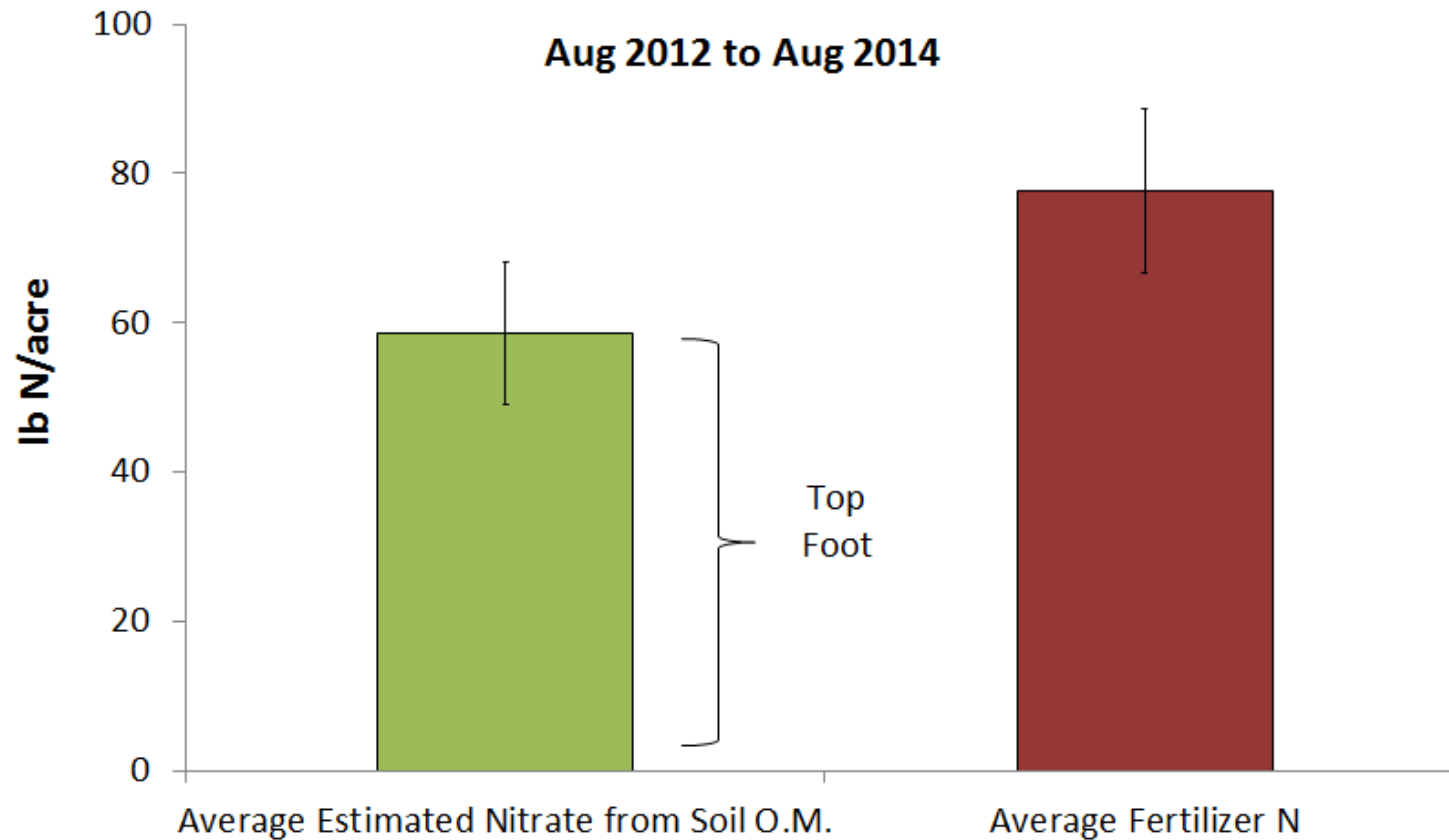
Shale Soil



***Take home: Only a small fraction of groundwater nitrate is estimated to come from shale***

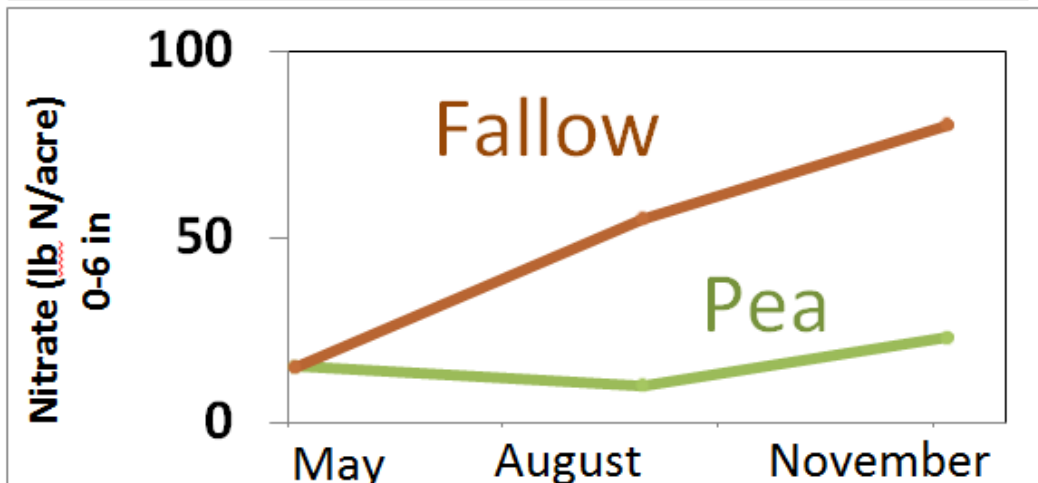
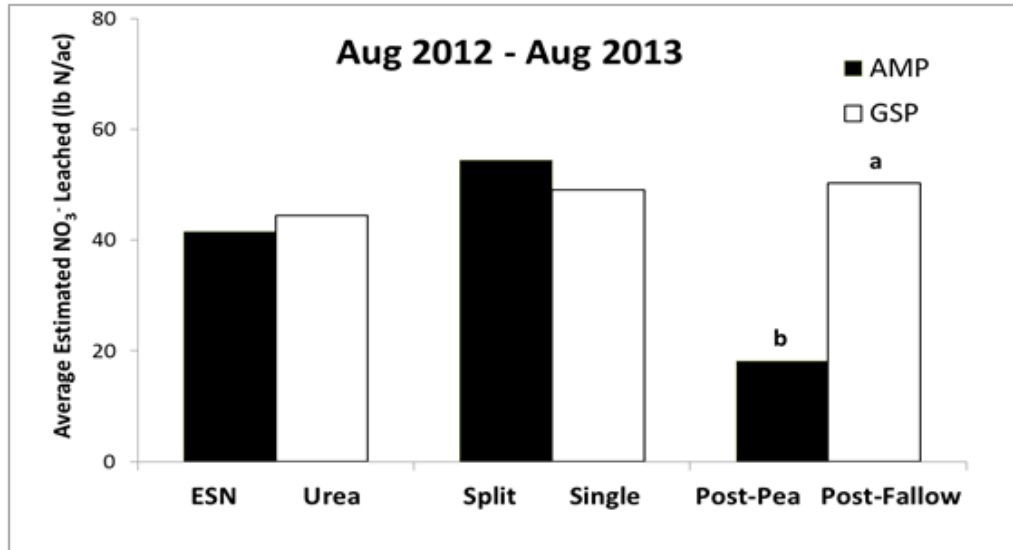
# 5

## Sources: Soil O.M. vs Fertilizer

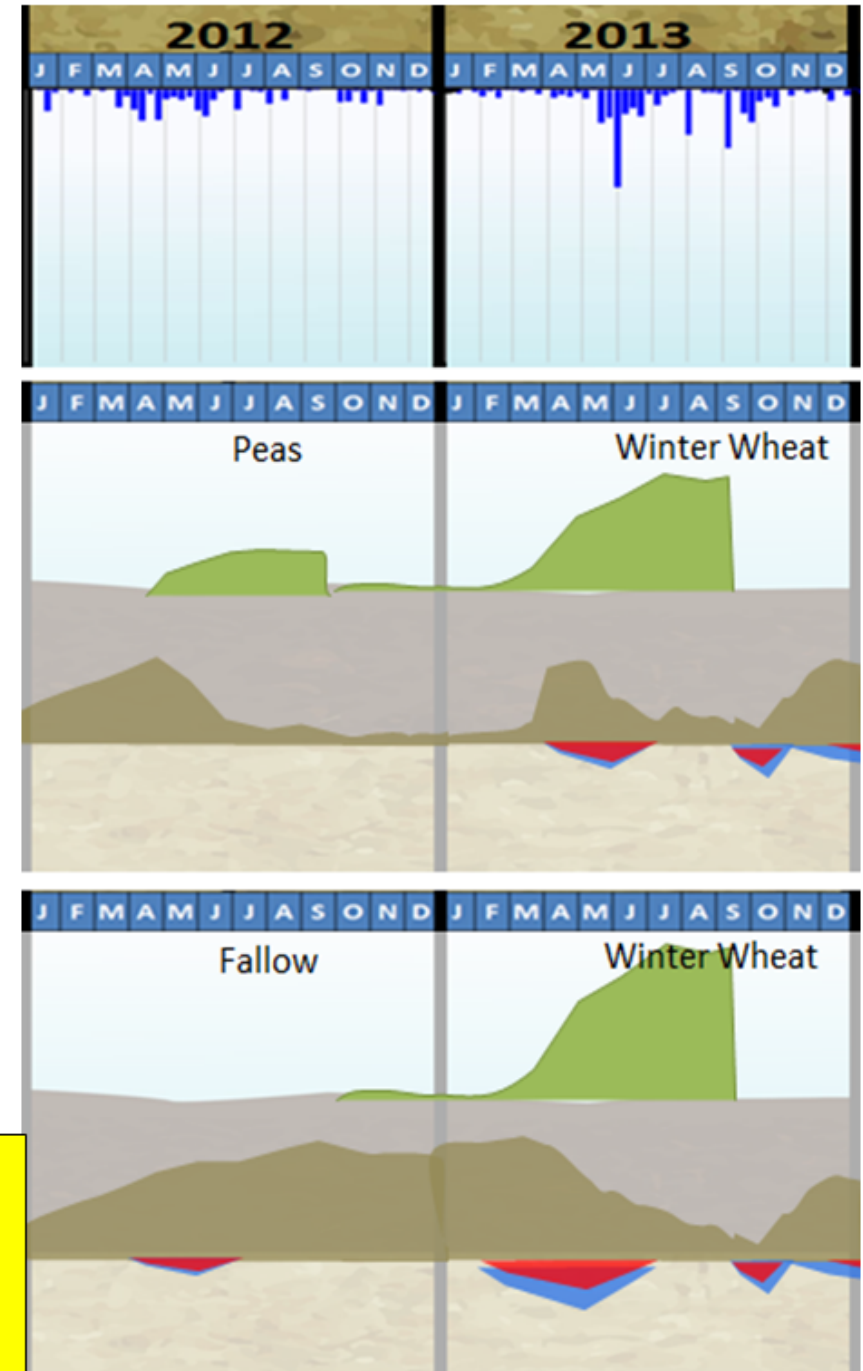


*Take home:* Organic matter decomposition in fields can produce almost as much soil nitrate as farmers apply to crops as fertilizer

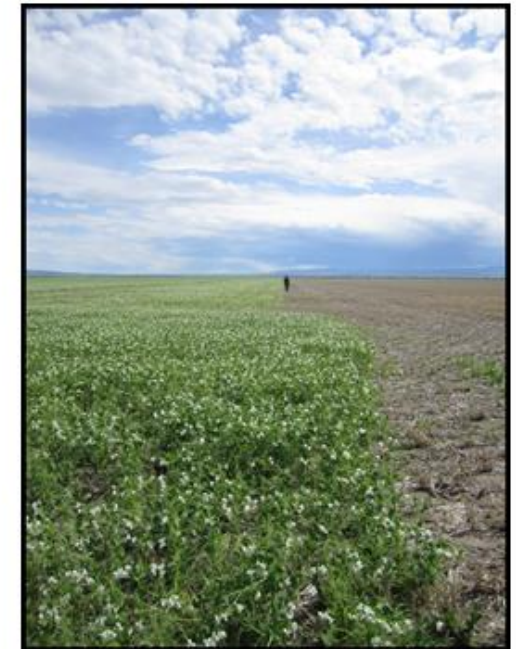
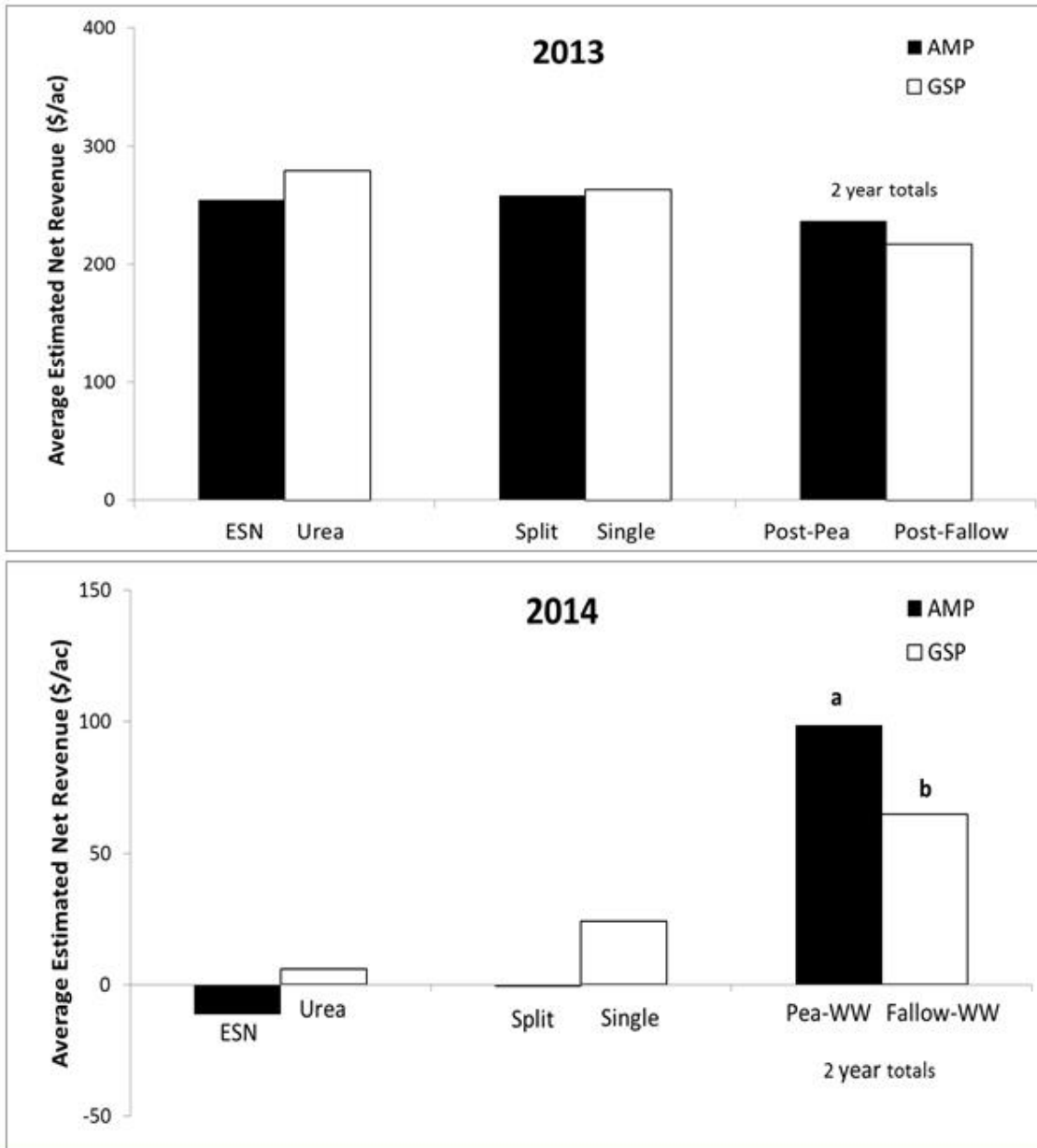
# 6 Mgmt Practice Effects on Leaching



*Take home: Pea reduced leaching compared to fallow*



# 7 Impacts on Net Revenue 2013-2014

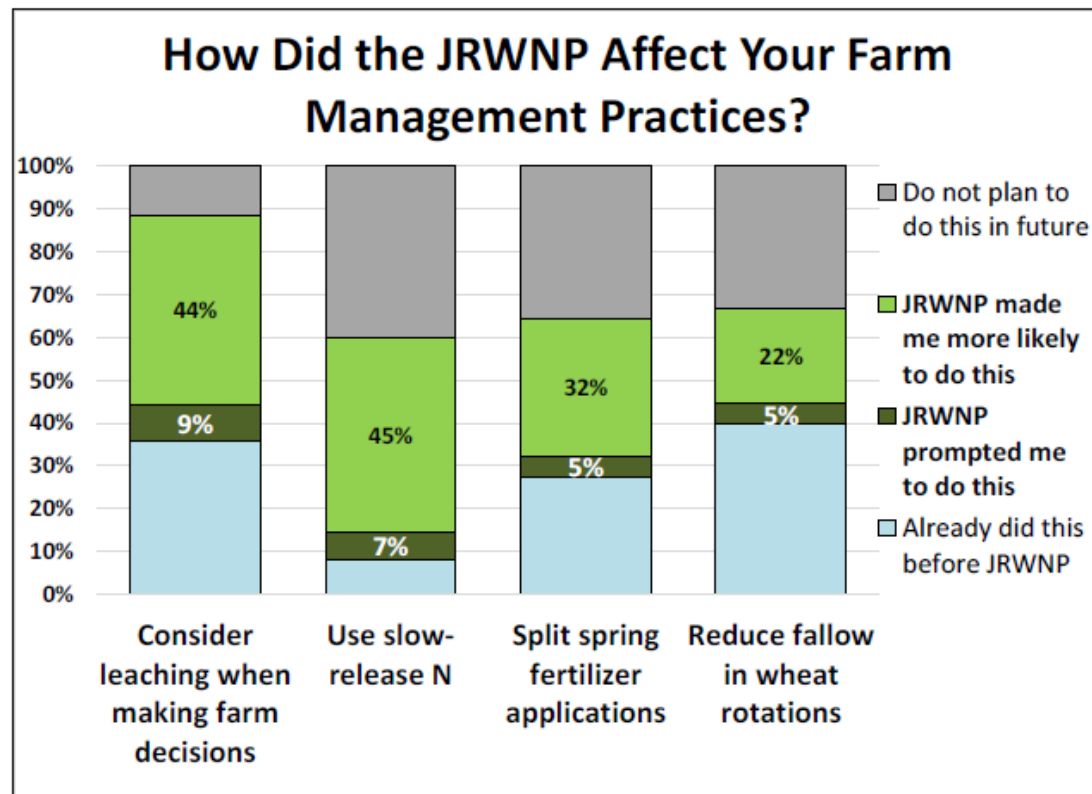
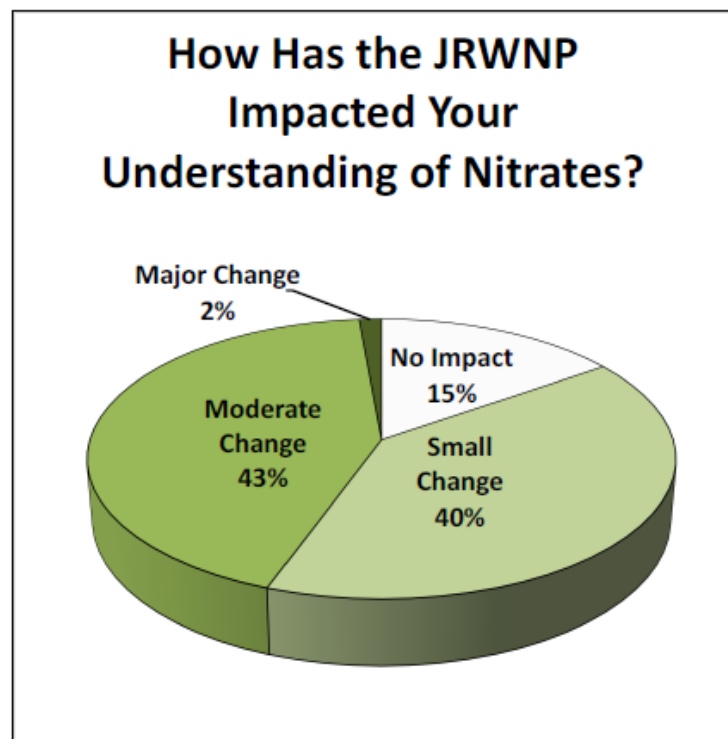


*Take home: Only pea increased net revenue*



# 8 Evidence of Project Impacts

## *Results of 2015 Farm Survey*



## Producer Research Advisory Group

Nita Bronec  
Greg Grove  
Jim Kulish  
Dave Linker  
Brandon Morris  
Bing VonBergen

## Acknowledgements

### Advisory Council

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