Northwestern Agricultural Research Center Field Day

June 24, 2015

11:30 am Registration and Introductions

12:00 pm Lunch Sponsored by CHS Kalispell

Guest Speakers: Dr. Barry Jacobsen, Department Head, Research Centers and Associate Director MAES
Dr. Charles Boyer, Vice President, Dean and Director, MSU College of Agriculture
Dr. Waded Cruzado, President, Montana State University

1:00 pm Field Tours

Northwestern Agricultural Research Center

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A Brief History of the Northwestern Agricultural Research Center

NWARC was established by the 1947 legislature to conduct agricultural research to benefit producers in Montana, particularly in the Northwestern part of the state. Of the 225 acres making up the grounds of the research center, 189 acres are planted to crops. Pastures are maintained on 30 acres of untillable ground. The remaining area is occupied by buildings, roads, lawn areas, and equipment yards. Of the 189 tillable acres, 140 acres are irrigated. The well is 358 feet deep, has a maximum volume of 271 acre-feet (AC-FT), and a flow rate of two cubic feet per second (CFS).

In the early years, research was conducted on both livestock and crops, with an emphasis on sheep and cereal production, respectively. With time, research focused more directly on crop production and included forages as well as cereals.

Research at NWARC has always been responsive to the needs of the local producers, particularly with respect to market fluctuations. And so, research has been conducted on various crops over time, and has included peppermint, spearmint, potatoes and camelina, to name a few. Similarly, as new pests appear in the region, research is redirected in order to develop management strategies to combat the new threat. Pest research initially emphasized weed management issues, but has evolved to include plant disease and insect pests as well.

Most recently, economic and environmental imperatives have resulted in a redirection of research emphasis to focus on crop nutrient use efficiency and water use efficiency. These two factors are essential for optimum crop production and quality, and will be increasingly important resources to manage wisely as NWARC continues to meet the future demands of Montana's agricultural producers and aligned industries.

Photo taken in 1953

Northwestern Agricultural Research Center Staff

Back Row: Mike Davis, Bob Stougaard, Heidi Dettmering, Raylene Kerney, Erik Echegaray, John Garner, Jordan Penney
Front Row: Ashley Hubbard, Jessica Torrion, Marcelle Tikka, Dennara Gaub, Dove Carlin, Brooke Bohannon
Not Pictured: Mary Ann Davis, Karly Hanson

Advisory Committee

Flathead County

Markus Braaten, Toby Goodroad, Tryg Koch, Andy Lybeck, Pat McGlynn, Miles Passmore, Dale Sonstelie, David Tutvedt

Lake County

Dan Barz, Scott Buxbaum, Dan Lake, Steve Siegelin, Jack Stivers, Steve Tobol

Lincoln County

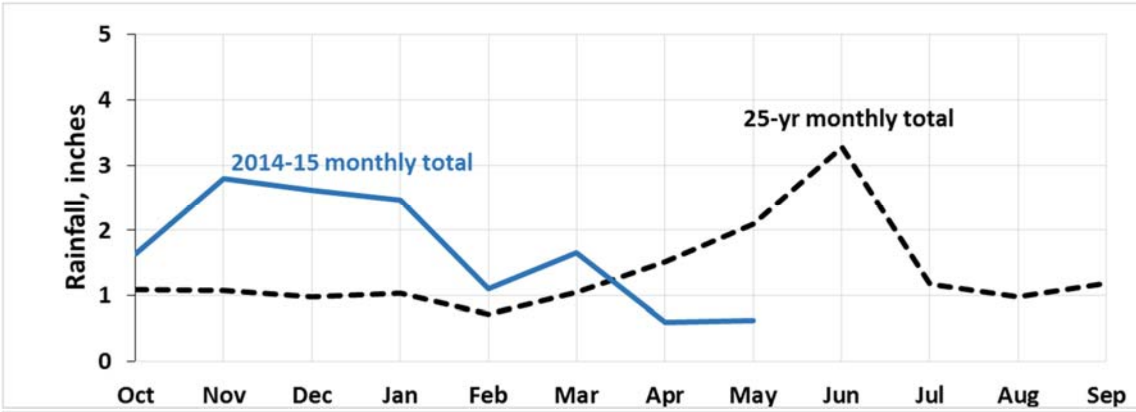
Ed Braaten, Joe McAfee

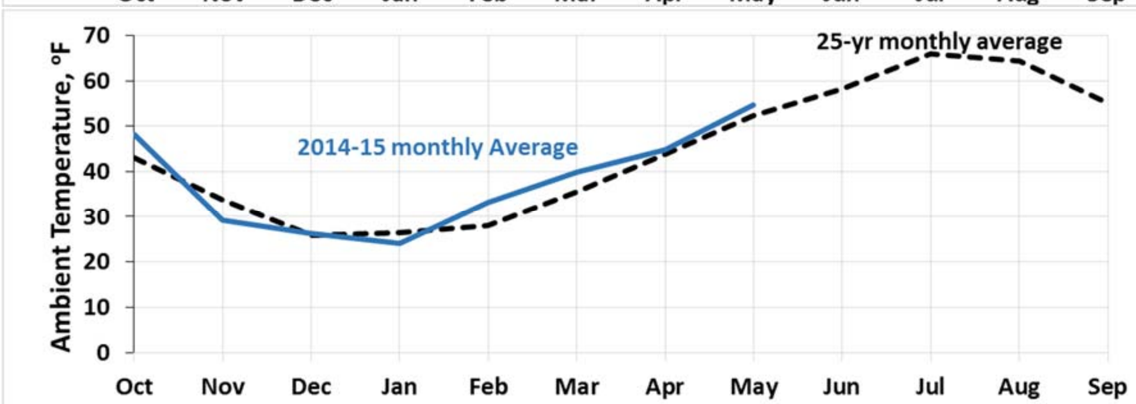
Sanders County

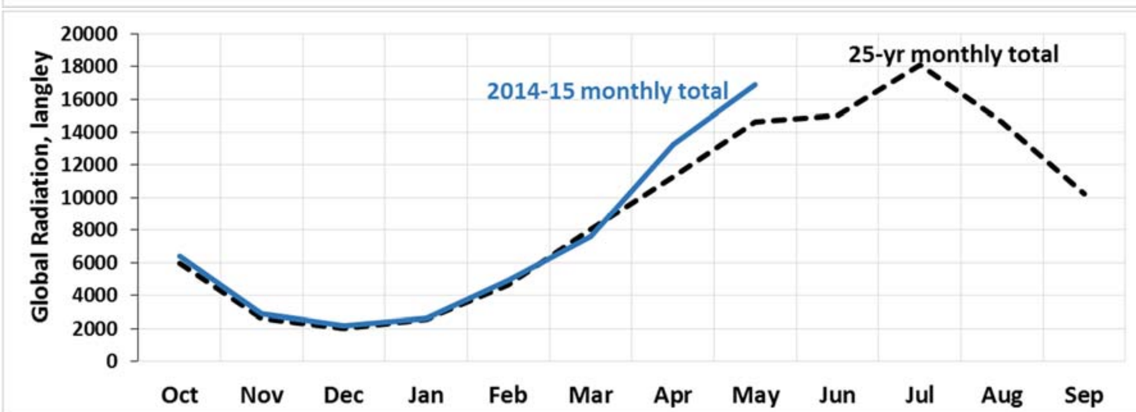
Jason Badger, Dale Neiman, Craig Weirather

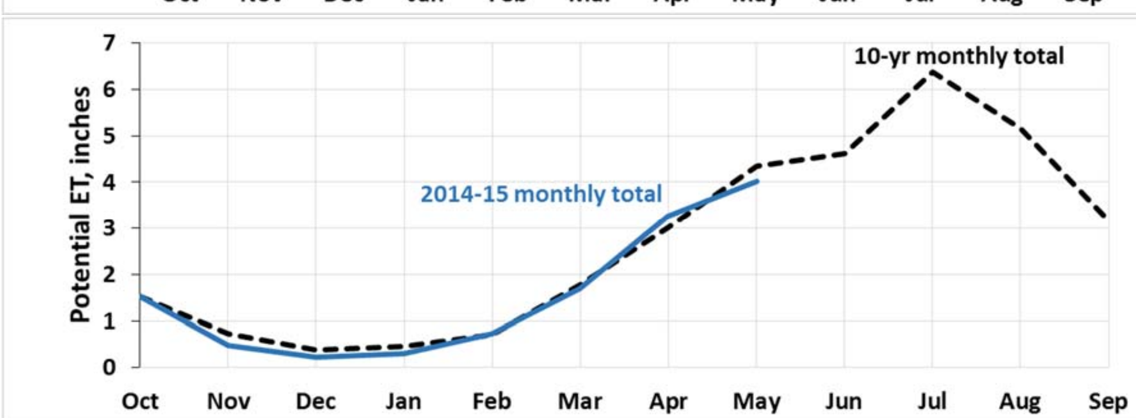
AgriMet
Cooperative Agricultural Weather Network

2014-2015 Weather Trend in Relation with the 25-year (1989-2014) Climate Data









Water Use Efficiency of Spring Wheat

The **goal of this research** is to determine the yield performance and grain quality of 8 spring wheat varieties when subjected to 100% evapotranspiration (ET), deficit (66%ET), and various early irrigation terminations.

The **final irrigation events** for FullIrr-1 was at early dough, FullIrr-2 at milk, and FullIrr-3 at flowering stage. *Irrigating at flowering is not recommended to avoid disease pressure*. Better yet, trigger irrigation just before flowering.

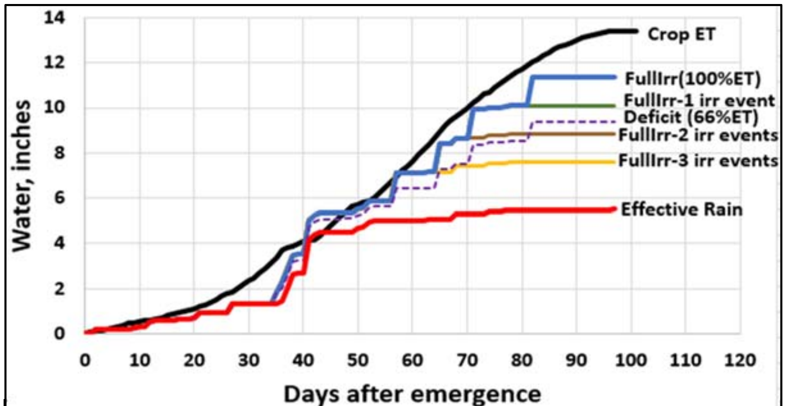


Figure 1. Water regime treatments in relation to crop ET of spring wheat (2014).

Yield with full season irrigation (FullIrr treatment [100%ET], Figure 1) did not differ from the early termination treatment (FullIrr-1). In fact, full season irrigation could negatively impact yield (see Buck Pronto green color bar yield response in Figure 1, top). This indicates that the water requirement from the dough period to physiological maturity is low, thus additional irrigation (Figure 2, top) does not provide any yield benefit.

Though an expected relation between yield and protein was observed (higher the yield, the lower the protein), **an increase in protein also was observed when supplemental irrigation was provided** relative to the dryland treatment, which can be attributed to the increased uptake of soil nitrogen. Also, no significant difference in protein was observed between treatments that received irrigation within milk to dough stage. This again indicates no advantage for protein when irrigation is applied within the dough stage.

Most varieties showed good tolerance towards Preharvest sprout (PHS), as represented by falling number, except Brennan where falling number decreased as the amount of irrigation applied increased (Figure 2)

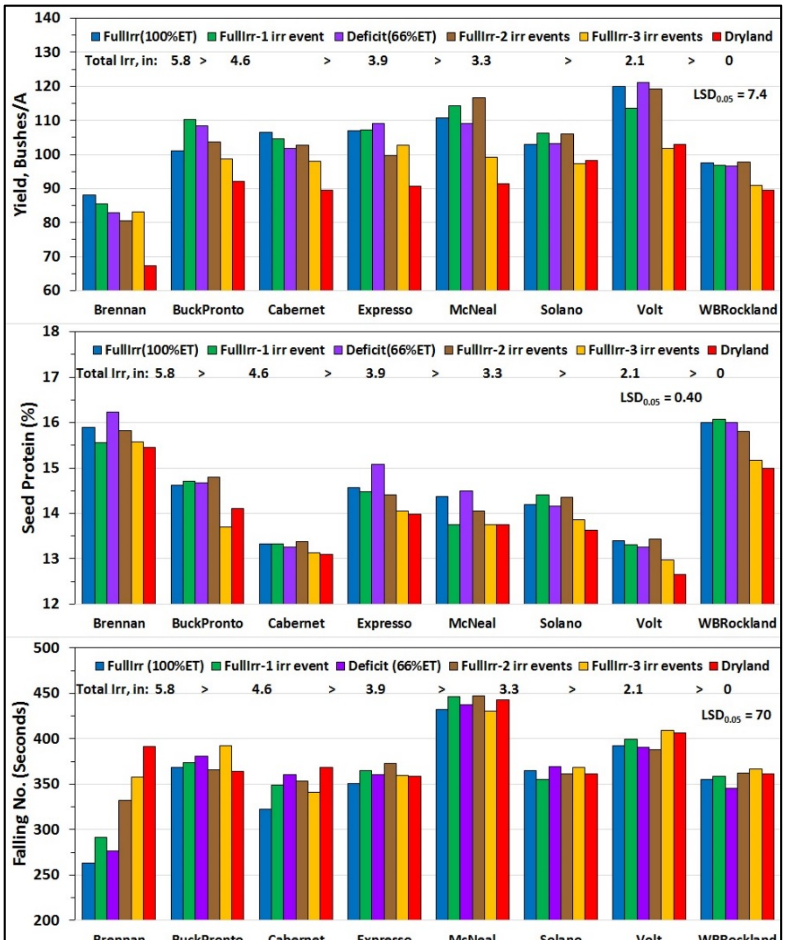


Figure 2. Yield (top), protein (middle) and falling number (bottom) of various spring wheat varieties with water treatments (2014).

Water Use Efficiency of Spring Wheat

Currently, for 2015, we are conducting similar studies to validate last year's results.

Table 1. Agronomic management information for 2015.

Planted:	April 22	Applied herbicide @4-leaf:	Husky Complete
Emerged:	May 5	Insecticide/Fungicide:	To be determined
Target plants:	$20/ft^2$	Fertilizer applied:	227 -45 -80
Seed treatment:	Cruiser Maxx Vibrance		

To improve our irrigation recommendation to growers, we installed Eddy Covariance Tower (below photo) that measures water and carbon fluxes in a producer's spring wheat field (South of MT 35, North of NWARC). We intend to validate crop coefficient (Kc) values for improved irrigation scheduling of agricultural crops.

Crop coefficient (Kc) is crop specific and changes over the course of the growing season. It is used to estimate crop evapotranspiration (ETc) (a.k.a. daily crop water use) by multiplying Kc with reference evapotranspiration (ETo) obtained from the weather stations (ETc = ETo x Kc).

Canola Planting Date, Variety and Density (DVD)

In 2012 the Flathead Valley experienced a late frost which caused severe damage to canola stands. Many producers were faced with the decision of whether or not to reseed their fields. Based on this experience and with the input of our Advisory Committee, we developed a research project to investigate the effects of seeding date, rate, and maturity on canola production.

This study consists of three plant densities, two maturity groups, and three seeding dates. DKL 30-03 and DKL 70-07 were selected as the early and late maturity varieties, respectively.

Table 1. Seed requirements to achieve targeted plant density

Variety	TKW	Target density (plants/sqft)	Rate (lb/ac)	Achieved density (plants/sqft)
DKL 30-03	4.7	4	2.4	5
DKL 30-03	4.7	8	4.8	11
DKL 30-03	4.7	16	9.6	21
DKL 70-07	5.1	4	2.6	5
DKL 70-07	5.1	8	5.2	11
DKL 70-07	5.1	16	10.4	19

lb/ac = 9.6 x plants/sqft x tkw ÷ 75% survival

Seeding dates were chosen by the number of growing degree days it takes for canola to be fully emerged and the first true leaf visible (300 GDD32).

Table 2. Seeding Dates

Date		
1	4/22/14	4/21/15
2	5/14/14	5/8/15
3	5/29/14	5/22/15

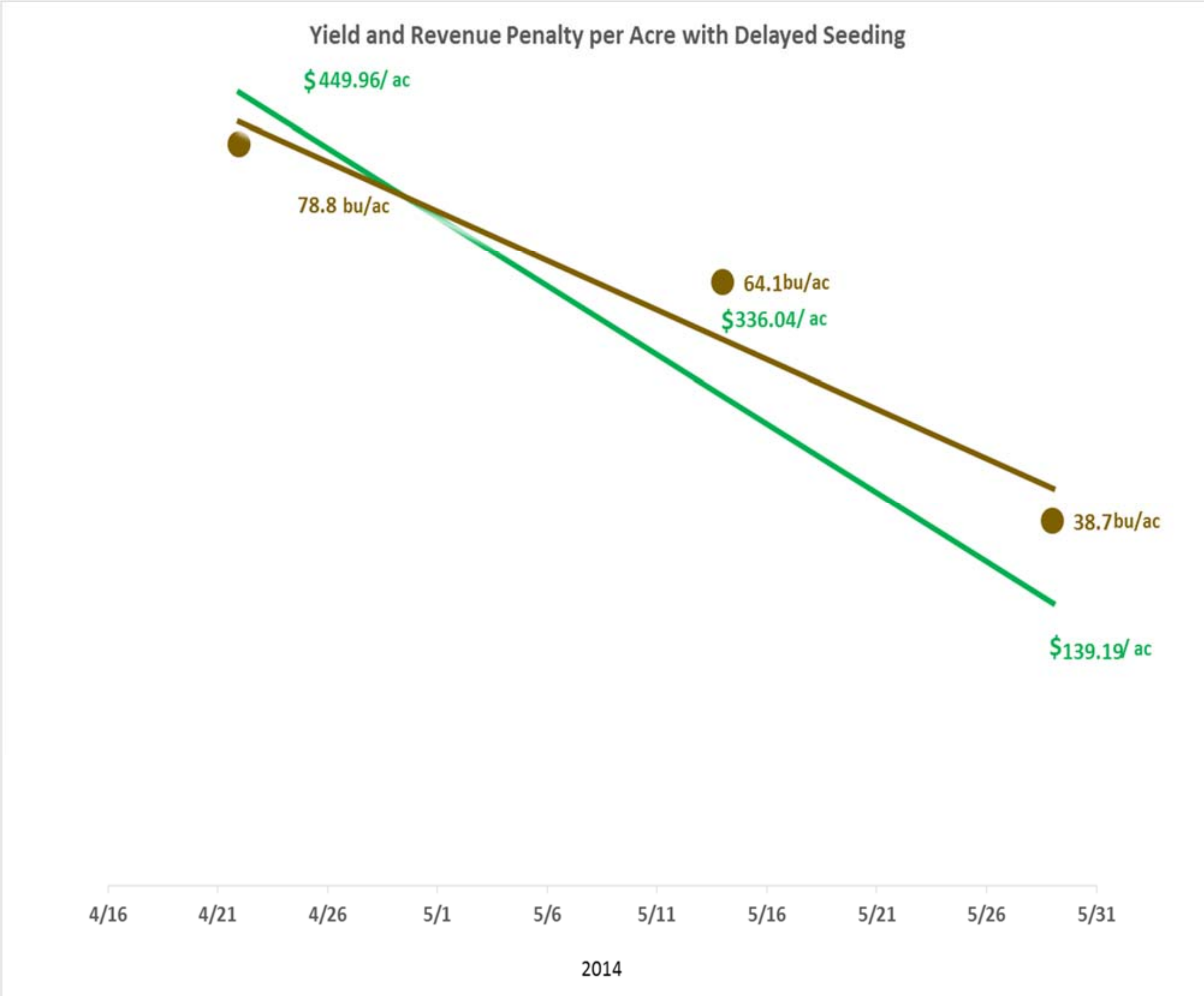
Table 3. Per acre input cost at 5 lb/ac of seed

Seed:	$535 / 50lb bag	$53.50
Fertilizer	50-30-40-20 $71.79 / ac	$71.79
Herbicide	Cornerstone (16oz/ac) $22/gal	$2.75
Insecticide	Warrior II (1.92oz/ac) $280/gal	$4.20
Fungicide	Endura (6oz/ac) $4.75/oz	$28.50
Total:		$160.74

Table 4.Main effect of planting date on agronomic performance of canola - 2014

Planting date	Emergence DAP	FLWR DAP	Density sqft	Lodging %	Height in	Yield bu/ac	Biomass g/sqft	Oil %	TWT lb/bu	# PODS /plant
4/22	13.8	61.8	11.2	46.9	56.6	78.8	107.0	49.2	49.4	138.9
5/14	6.9	50.7	12.7	45.0	59.5	64.1	130.3	48.2	48.9	84.4
5/29	5.8	46.8	13.6	30.0	53.1	38.7	83.6	48.4	48.0	62.1
LSD	0.9	1.1	ns	ns	3.7	7.8	19.4	0.5	ns	42.3
Pr>0.05	0.0001	0.0001	0.0753	0.1643	0.0226	0.0003	0.0068	0.0097	0.1592	0.0167

DAP: days after planting, FLWR: 50% flowering, TWT: test weight, ns: no significant differences



Canola yields declined as planting date was delayed. Yields declined from 78.8 bu/ac for the first seeding date, to 38.7 bu/A for the third seeding date. This equates to approximately a bushel per day for every day planting was delayed after April 22.

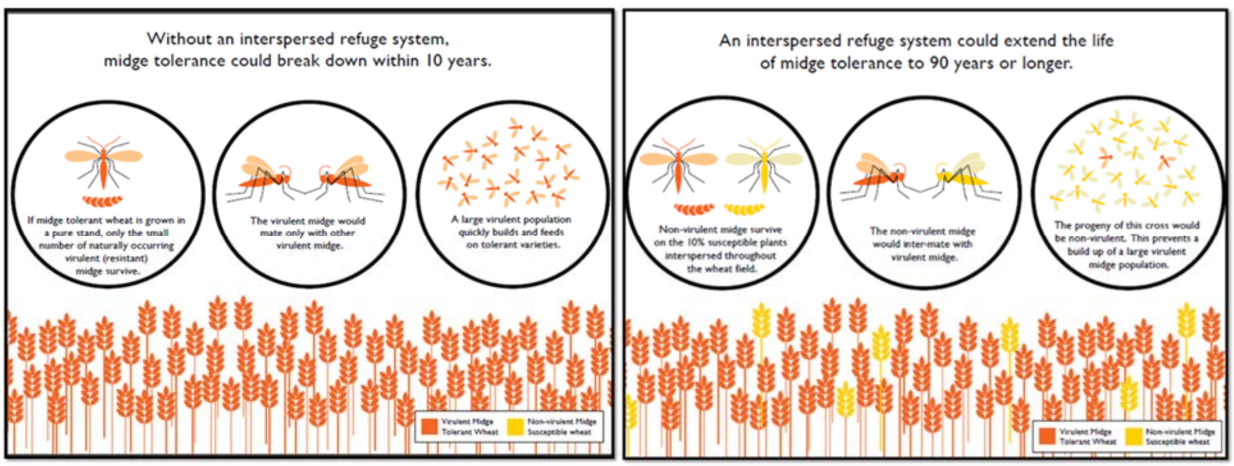
Although the reduction in canola yield was substantial, revenues declined at an even greater rate. The revenue loss was roughly $8.00 per acre per day.

In summary, the greatest yield was afforded with the earliest seeding date. When faced with the decision of having to plant late or re-plant a field, one needs to know what the expected yield is for a particular field and estimate a yield reduction of 15-25% for a mid-May seeding date and a 30-50% yield reduction for a late May seeding date.

Development of Orange Wheat Blossom Midge Resistant Spring Wheats

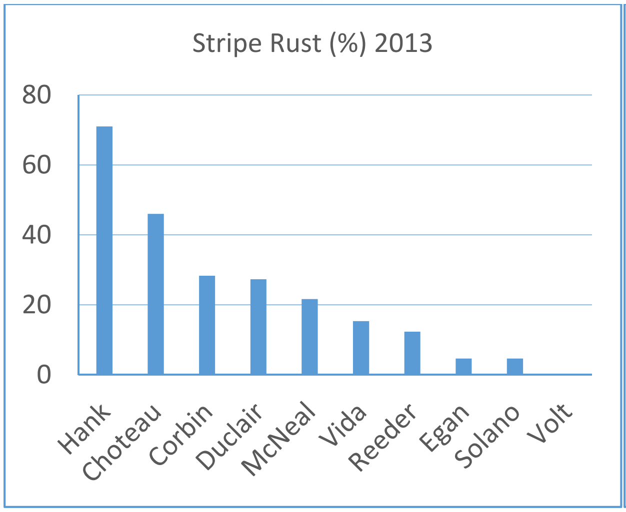
Long-term control of the orange wheat blossom midge (OWBM) will require the use of several management tools. Host plant resistance is one of the most economical and efficient forms of control available to producers. A resistance gene, called Sm1, has been identified that causes death of the midge larvae as they feed on the kernel. Dr. Luther Talbert has been conducting a backcross and selection program to incorporate the Sm1 gene into locally adapted spring wheats. Progress has been made and MSU has recently released “EGAN”, its first midge resistant variety.

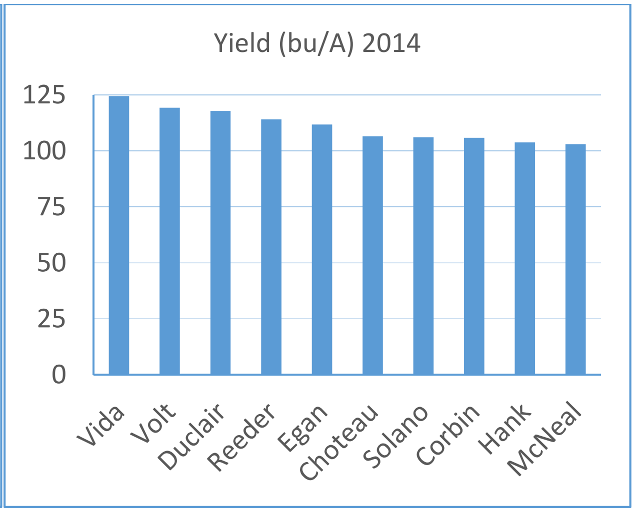
The resistance gene is highly effective, resulting in almost complete mortality of the wheat midge. This level of selection pressure is so intense that entomologists are concerned that the midge population might develop resistance to the gene. Some predict that resistance to the Sm1 gene could breakdown within 10 years!



In order to delay the development of resistance, entomologists are recommending that producers use variety blends, or an interspersed refuge system. With this strategy, a susceptible variety is blended with the midge resistant variety at a ratio of 1 to 9. The combination is planted together so that the susceptible variety serves as a refuge and allows a small number of midge to reproduce and maintain diversity within the midge gene pool. This strategy should hopefully extend the utility of the Sm1 gene for 90 years or more.

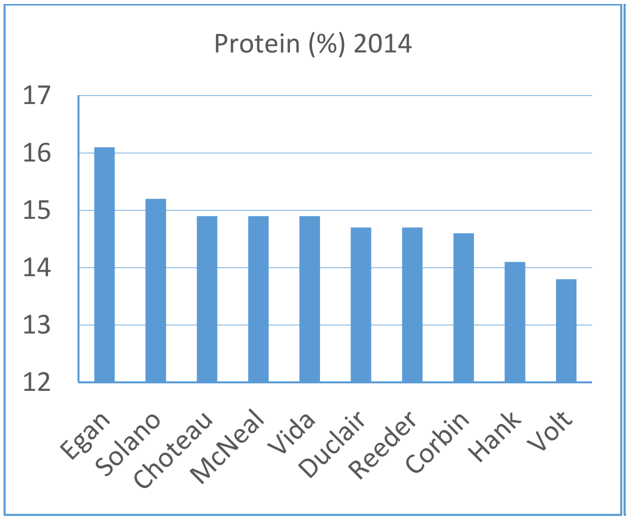
Spring wheat growers will only be able to purchase this seed as a blend, and they will not be able to save back harvested seed. This requirement exists in order to maintain the 1 to 9 ratio of susceptible to resistant spring wheat varieties. Nevertheless, the benefits of the Sm1 gene are substantial. This technology offers greater flexibility in crop rotations and seeding dates. Most importantly, it should eliminate the need to use insecticides. Eliminating the need to scout fields and spray for the midge provides more time to devote to other activities.

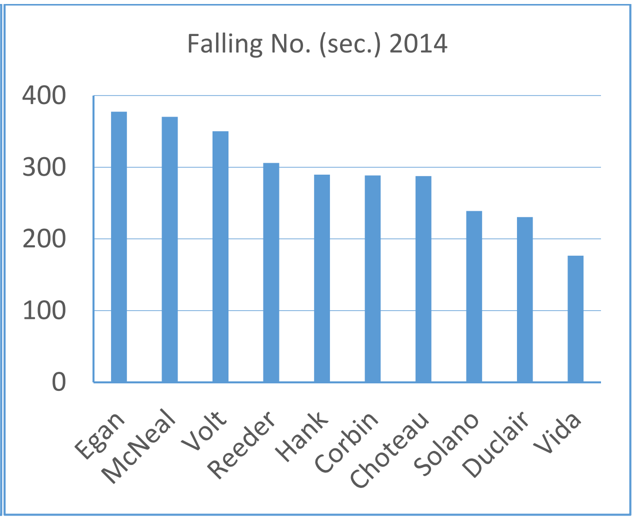




Although the benefits of the Sm1 gene are significant, Egan offers other advantages as well. Egan is not only resistant to the orange wheat blossom midge, but also has resistance to stripe rust. As such, Egan could eliminate the need for an insecticide as well as a fungicide application, potentially saving growers about $34 per acre compared to susceptible spring wheats.

In the absence of insect or disease pressure, Egan provides yields that are comparable to the average of our recommended varieties. And although Egan is a semidwarf, lodging can be a concern. However, grain quality with Egan is outstanding. Egan consistently produces the highest grain protein and falling numbers of the varieties evaluated at NWARC.





Breeding efforts continue to in an attempt to identify superior spring wheat varieties with resistance to the wheat midge. In the meantime, Egan provides a valuable tool in the battle against the orange wheat blossom midge.

Demographics of Agriculture in Northwestern Montana

Based on 2012 Montana Department of Agriculture Statistics

Agriculture is the largest industry in the state of Montana and generates approximately $4,743,600,000 per year. The next leading industries are travel at $2,643,900,000, third is gas and oil at $2,329,700,000, fourth is mining at $1,717,500,000, and fifth is wood and paper products at $580,000,000.

Agriculture also is an important economic driver in Northwest Montana. This region includes the counties of Flathead, Lake, Sanders and Lincoln, and collectively these counties generate approximately $152,751,000 in revenue from agriculture on an annual basis. This equates to 3.2 % of the state's agricultural industry. Lake County brings in the largest amount with a gross income of $56,563,000, next is Flathead County with $34,677,000, third is Sanders County with $14,227,000 and fourth is Lincoln County at 3,466,000.

Statewide there are 59,758,917 acres in farms and ranches, with Northwest Montana having 1,111,673 acres. Lake County has the greatest number of acres with 555,766, followed by Sanders with 338,725, Flathead with 169,898 and Lincoln County with 47,284 acres. Based on a per acre basis Flathead Country has a gross income of $204.10 per acre followed by Lake County at $101.77 per acre, third is Lincoln at $73.30 per acre and fourth is Sanders at $42.00 per acre. In comparison, the state-wide average is $79.38 per acre. This encompasses income derived from both livestock and crops.

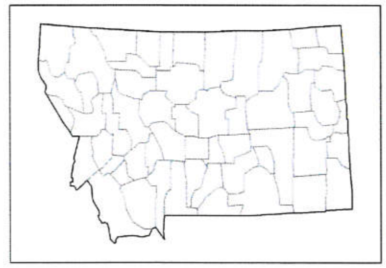
The average farm/ranch sizes in northwestern Montana range from a low of 145 acres in Lincoln County to a high of 688 acres in Sanders County. In comparison, the average size farm/ranch size for the state of Montana is 2,134 acres. Statewide, Montana's farm and ranch land consists of 65.8% pasture, 28.5% cropland and 5.8% in other (which includes timber). The land use base in northwestern Montana varies by county. Woodlands dominate the land use patterns in Lake (44%) and Lincoln (45.5%) Counties, whereas pastures (50.7%) and cropland (42 %) comprise the majority of the land use in Sanders and Flathead Counties, respectively.

The crop mixture within the 4 northwestern counties are very similar. The largest acreage within the 4 counties is hay, followed by hard red spring wheat, hard red winter wheat, white wheat, barley, oats and corn. We also have some specialty crops raised within this region, with Lake and Flathead Counties raising certified seed potatoes for Washington, Idaho and Oregon. Canola is increasing in acres with this year having approximately 7000 acres. Other specialty crops include peppermint, spearmint, camelina, peas, dill, lentils, and malt barley.

Raising crops in Northwest Montana differs compared to the rest of Montana, largely due to the local climatic conditions. As a result, variety selection, soil fertility, and pest management issues are unique to this area of Montana. This area is noted for warm days 80-90 degrees with cool nights, often down into the 40's. This type of weather pattern limits the type of crops that can be raised. Northwest Montana is a semi-arid area, receiving about 15-16 inches of rainfall and having about 100-120 frost free days.

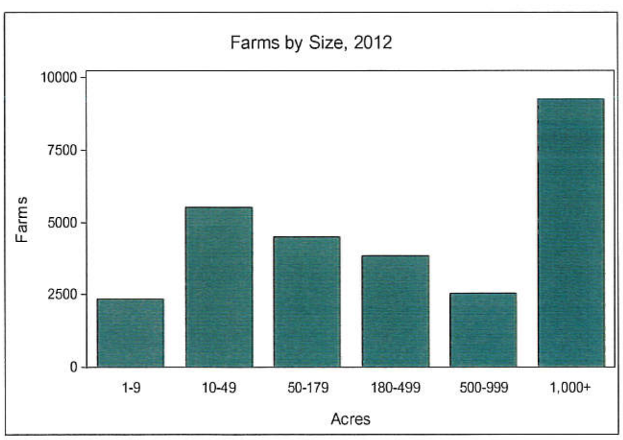
2012 CENSUS OF AGRICULTURE

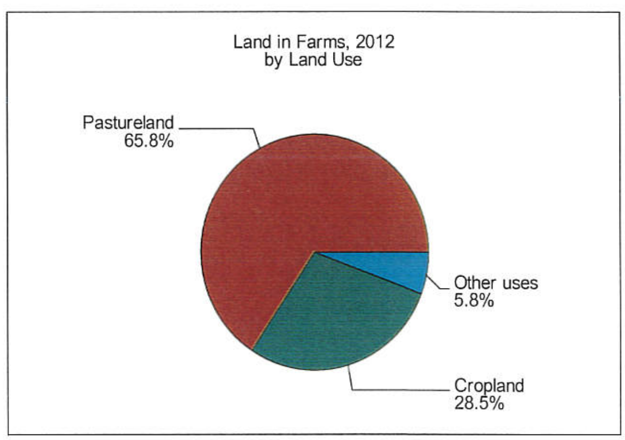
STATE PROFILE



Montana

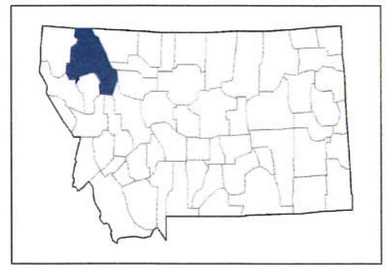
	2012	2007	% change
Number of Farms	28,008	29,524	- 5
Land in Farms	59,758,917 acres	61,388,462 acres	- 3
Average Size of Farm	2,134 acres	2,079 acres	+ 3
Market Value of Products Sold	$4,230,083,000	$2,803,062,000	+ 51
Crop Sales $2,255,996,000 (53 percent) Livestock Sales $1,974,087,000 (47 percent)			
Average Per Farm	$151,031	$94,942	+ 59
Government Payments	$209,846,000	$221,977,000	- 5
Average Per Farm Receiving Payments	$16,865	$16,971	- 1





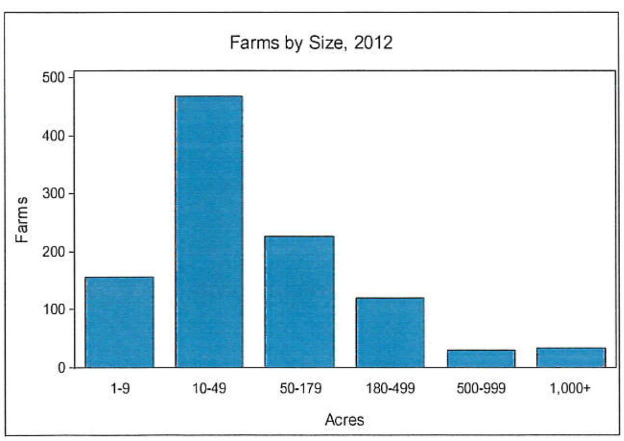
2012 CENSUS OF AGRICULTURE

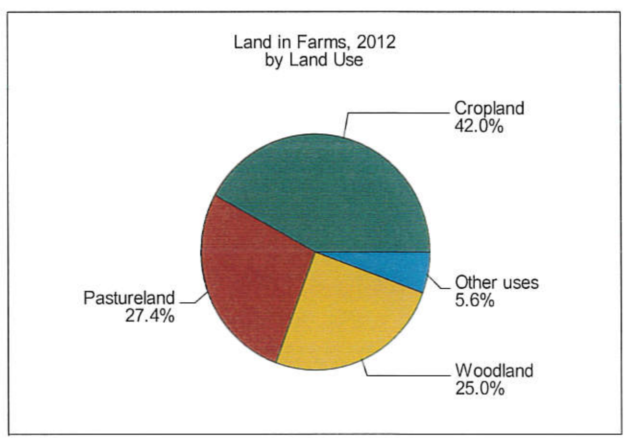
COUNTY PROFILE



Flathead County
Montana

	2012	2007	% change
Number of Farms	1,035	1,094	- 5
Land in Farms	169,898 acres	251,597 acres	- 32
Average Size of Farm	164 acres	230 acres	- 29
Market Value of Products Sold	$34,677,000	$33,525,000	+ 3
Crop Sales $27,593,000 (80 percent) Livestock Sales $7,083,000 (20 percent)			
Average Per Farm	$33,504	$30,644	+ 9
Government Payments	$707,000	$1,001,000	- 29
Average Per Farm Receiving Payments	$4,108	$4,699	- 13





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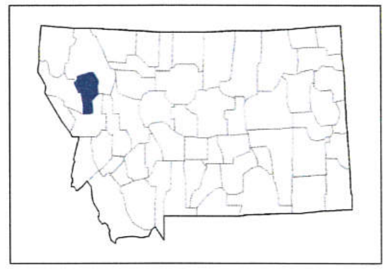
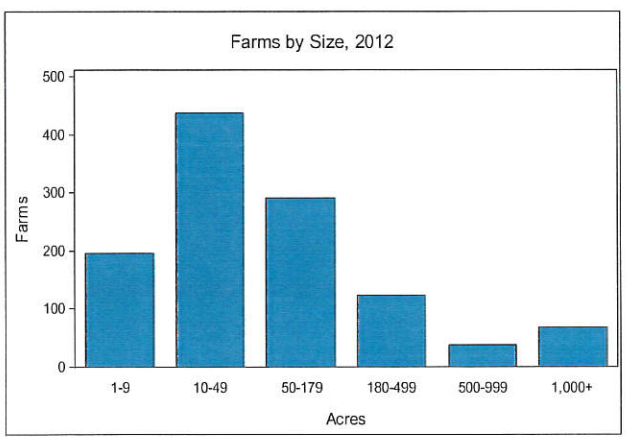
2012 CENSUS OF AGRICULTURE

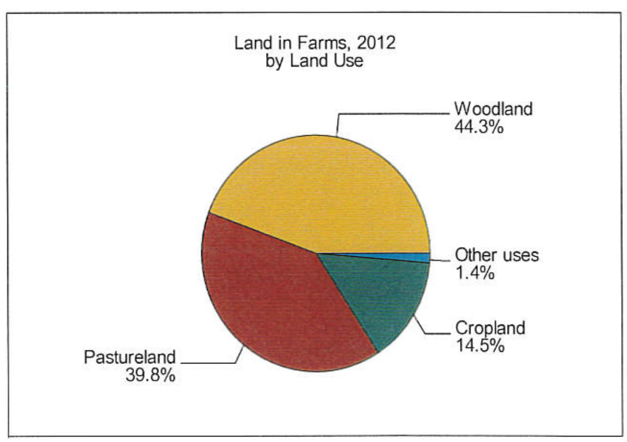
COUNTY PROFILE



Lake County
Montana

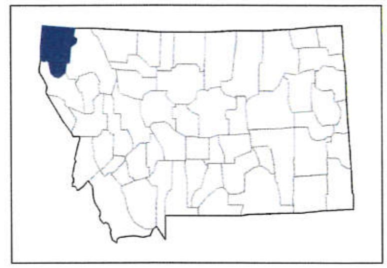
	2012	2007	% change
Number of Farms	1,156	1,280	- 10
Land in Farms	555,766 acres	637,306 acres	- 13
Average Size of Farm	481 acres	498 acres	- 3
Market Value of Products Sold	$56,563,000	$51,631,000	+ 10
Crop Sales $24,269,000 (43 percent) Livestock Sales $32,294,000 (57 percent)			
Average Per Farm	$48,930	$40,337	+ 21
Government Payments	$783,000	$698,000	+ 12
Average Per Farm Receiving Payments	$3,347	$3,524	- 5





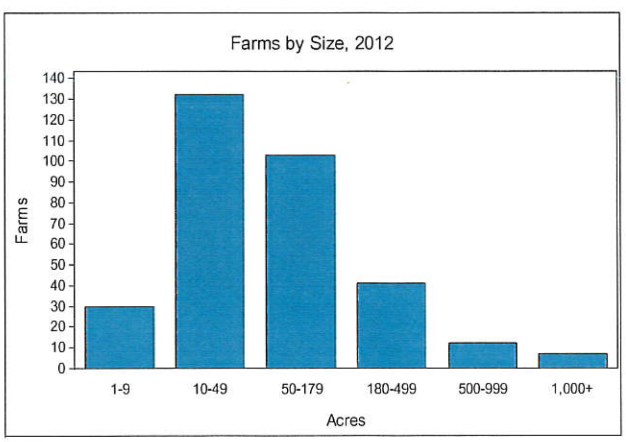
2012 CENSUS OF AGRICULTURE

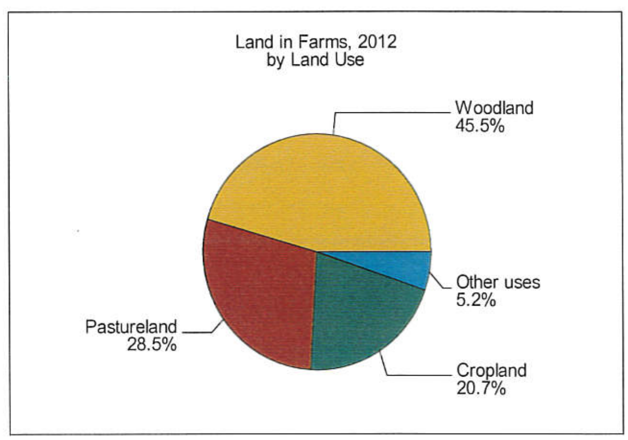
COUNTY PROFILE



Lincoln County
Montana

	2012	2007	% change
Number of Farms	325	350	- 7
Land in Farms	47,284 acres	51,885 acres	- 9
Average Size of Farm	145 acres	148 acres	- 2
Market Value of Products Sold	$3,466,000	$2,705,000	+ 28
Crop Sales $1,007,000 (29 percent) Livestock Sales $2,459,000 (71 percent)			
Average Per Farm	$10,665	$7,728	+ 38
Government Payments	$55,000	$24,000	+ 129
Average Per Farm Receiving Payments	$4,987	$2,645	+ 89





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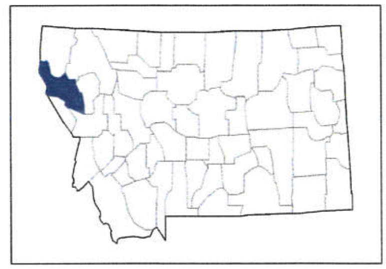
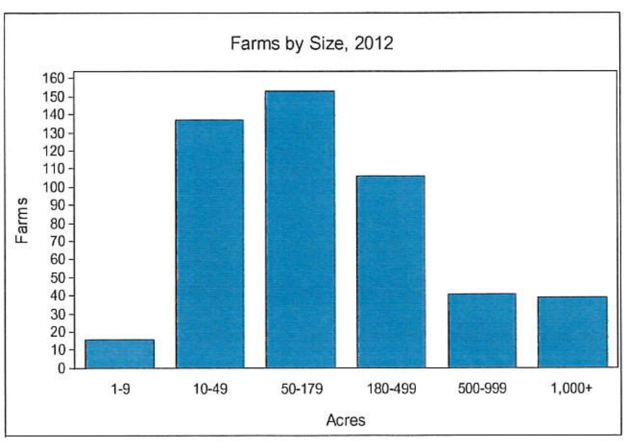
2012 CENSUS OF AGRICULTURE

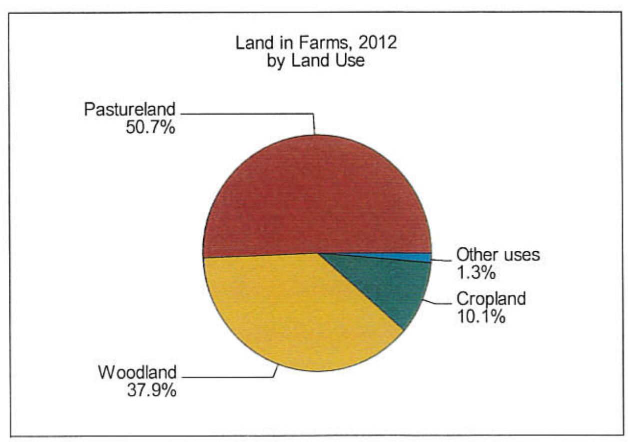
COUNTY PROFILE



Sanders County
Montana

	2012	2007	% change
Number of Farms	492	508	- 3
Land in Farms	338,725 acres	341,913 acres	- 1
Average Size of Farm	688 acres	673 acres	+ 2
Market Value of Products Sold	$14,227,000	$14,010,000	+ 2
Crop Sales $5,524,000 (39 percent) Livestock Sales $8,702,000 (61 percent)			
Average Per Farm	$28,916	$27,579	+ 5
Government Payments	$501,000	$183,000	+ 174
Average Per Farm Receiving Payments	$9,444	$2,776	+ 240





Assessment and Management of Falling Number in Montana Wheat

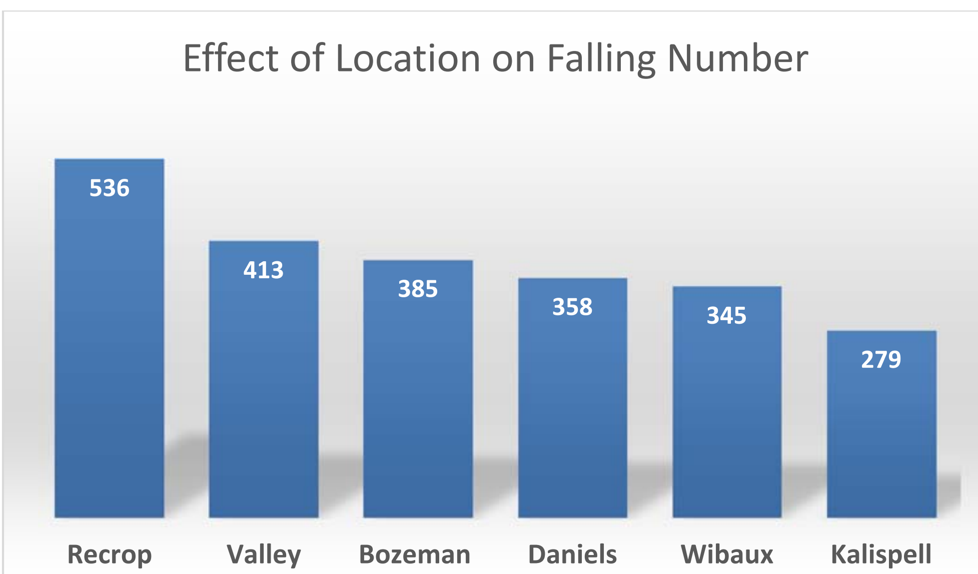
Today's grain buyers are demanding that specific quality standards be met. As a result, marketing at the elevator now involves a host of tests to prove that the grain meets these quality attributes. Falling number (FN) is such a test, the results of which affect both the grade and marketing price of wheat, and in turn, profitability.

The FN test provides an indication as to whether or not the grain has started to germinate in the head prior to harvest. This is very important, because baking quality declines as germination proceeds. During germination, the seed produces an enzyme called alpha amylase (AA). Alpha amylase converts starch into sugar. A certain amount of AA is necessary for proper baking to occur, as it breaks down starches to provide sugars to fuel the yeast fermentation process. However, if the activity is too high, the result is a sticky bread crumb and low loaf volume.

This is a huge problem for the baking industry, which needs a way to determine whether or not flour is of sound quality. It takes too long to bake bread or test for AA activity on every truckload of wheat, but the FN test provides a quick, indirect measure of AA activity by simulating the physical changes flour undergoes during baking.

It's important to note that high AA activity results in low FN values, and that low AA produces high FN values. Complicating matters further is the fact that there are three different AA families present in the wheat seed.

The major AA enzyme family is associated with wet harvest conditions and is responsible for the majority of FN problems. The second amylase family is associated with high altitudes and cold temperature shock midway through grain filling. The third enzyme is expressed with insect feeding, specifically by the orange wheat blossom midge. All three affect wheat in northwestern Montana.

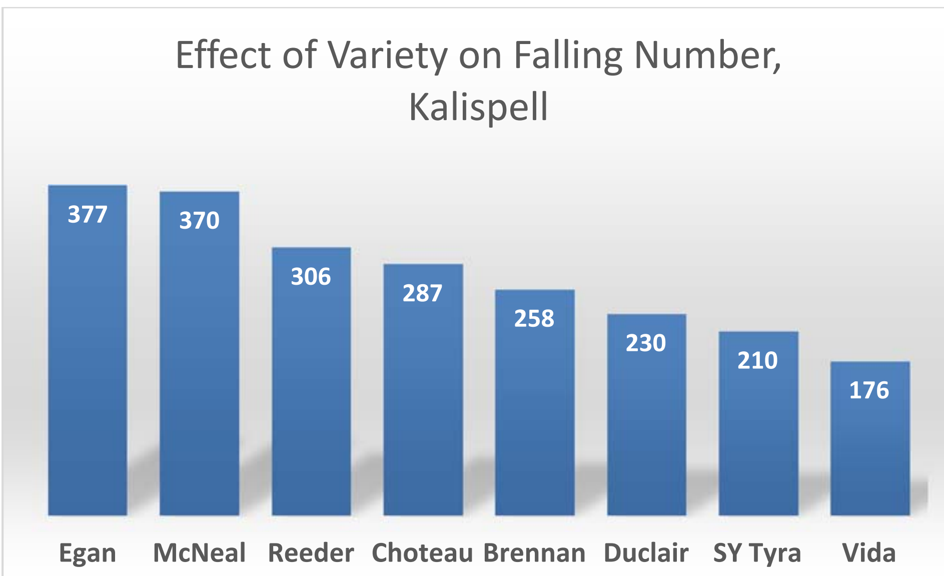


Although FN is a major concern in northwestern Montana, this is an issue of economic importance in other areas of the state, and the PNW region as a whole. Globally, the wheat industry can lose as much as $1 billion a year as a result of premature germination.

The three AA enzyme families illustrate that FN values are affected by environment, especially by rainfall patterns and temperature. Furthermore, the impact that these variables have on FN depends on when these weather events occur relative to the growth stage of the crop.

Rainfall is credited with having the greatest impact on FN, especially when it occurs after the grain has reached physiological maturity. Lodging accentuates the problem because humidity levels are high, especially for those plants laying directly on the soil surface. There's not much that can be done to control rainfall, but there are tools available to minimize lodging. One area that we have been investigating is the use of plant growth regulators to help reduce the incidence of lodging, and in turn, produce higher FN values.

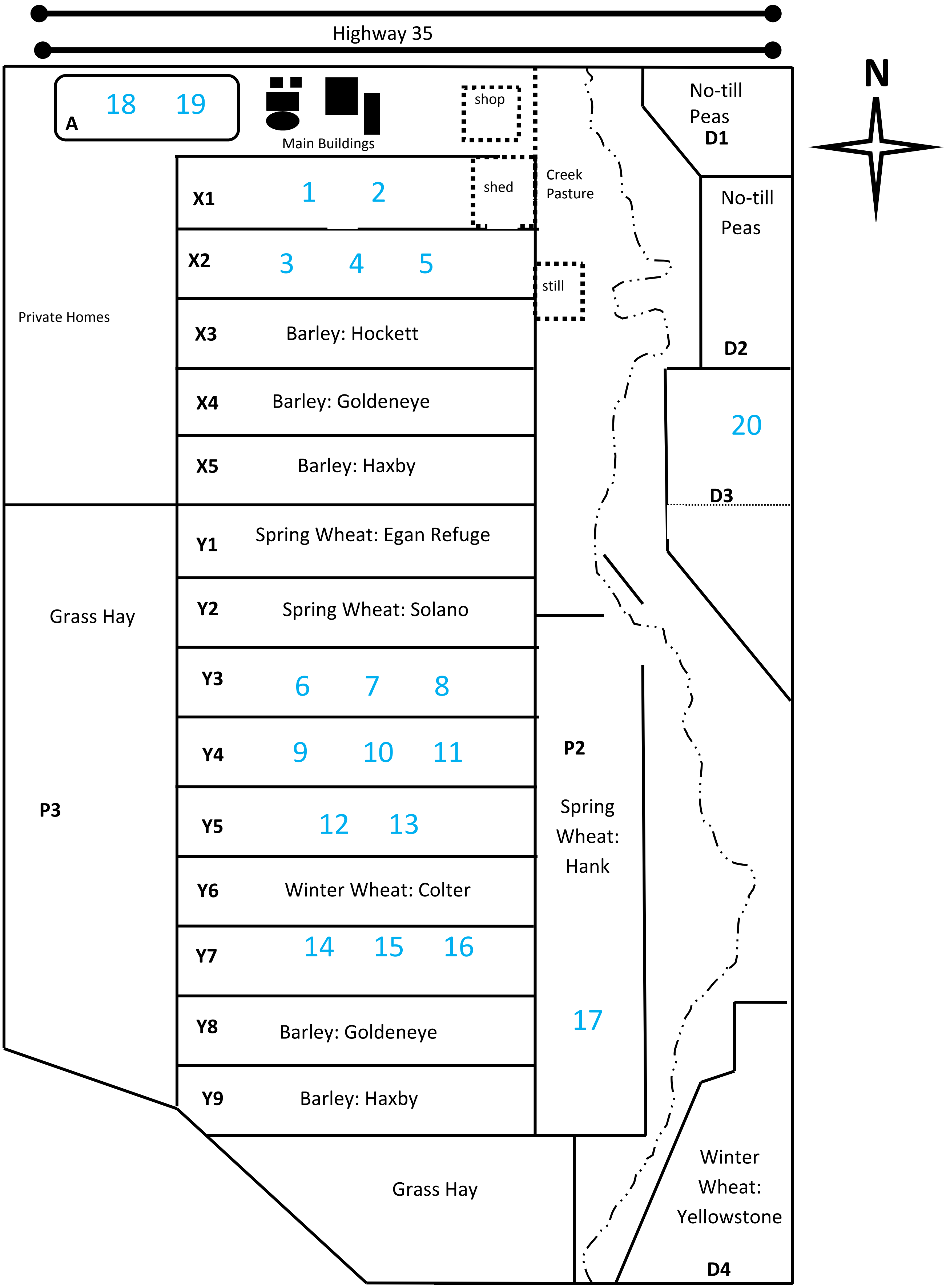
Although FN values are affected by environment, there is tremendous genetic variation for FN among wheat varieties grown in Montana. Since the market price received at the elevator depends on grain quality, Montana producers could benefit from knowledge pertaining to the FN values associated with specific winter and spring wheat varieties. We annually screen experimental and commercially available winter and spring wheats in order to characterize varieties as susceptible or resistant to low FN.



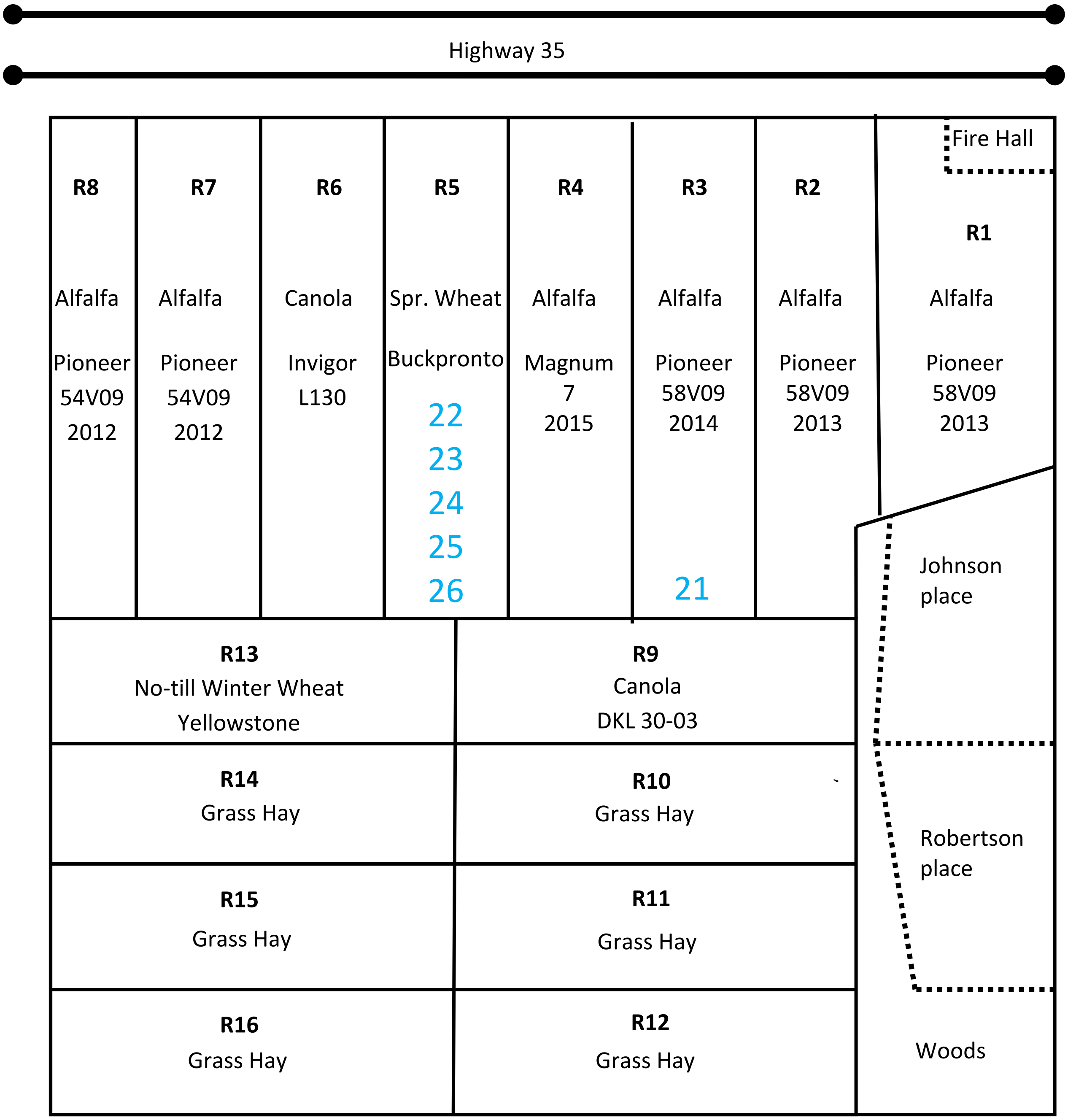
While screening wheat for low FN helps Montana wheat producers avoid this issue in the near term, long term success depends on identifying genes responsible for seed dormancy and incorporating these traits into Montana adapted germplasm. Seed dormancy is controlled by many genes, some of which are just starting to be identified.

Understanding what factors control these genes is another area of study. Abscisic acid is a major plant hormone that plays an important role in regulating seed germination. Abscisic acid inhibits seed germination by reducing the synthesis of gibberellic acid. This in turn results in lower concentrations of alpha amylase. We are currently evaluating ABA under field conditions for the potential to minimize dockage attributed to low falling numbers.

Northwest Ag Research Center Field Map-East Side



Northwest Ag Research Center Field Map



2015 NWARC Studies and Objectives

X1

1) Barley Off Station Nursery

Objective: To evaluate the agronomic performance of commercial barley varieties grown in environments representative of northwestern Montana.

2) Hull-less Barley Nursery

Objective: To evaluate the agronomic performance of hull-less barley varieties grown in environments representative of northwestern Montana.

X2

3) Nitrogen Use Efficiency Study

Objective: To evaluate variety-specific nitrogen use response of irrigated spring wheat.

4) Water Use Efficiency Study

Objective: To evaluate water use response of spring wheat varieties on yield and quality.

5) Spring Wheat Abscisic Acid Study

Objective: To evaluate foliar applications of abscisic acid for prevention of pre-harvest sprout.

Y3

6) Spring Wheat Advanced Yield Nursery

Objective: To evaluate spring wheat varieties and experimental lines for agronomic performance in environments representative of northwestern Montana.

7) Western Regional Soft White Spring Wheat Nursery

Objective: To evaluate soft white spring wheat varieties for agronomic performance in environments representative of northwestern Montana.

8) Western Regional Hard Red Spring Wheat Nursery

Objective: To evaluate hard red spring wheat varieties for agronomic performance in environments representative of northwestern Montana.

Y4

9) Canola Planting Date and Population Study

Objective: To identify the optimum canola planting date and density for northwestern Montana.

10) Canola Variety Nursery

Objective: To evaluate canola varieties for agronomic performance in environments representative of northwestern Montana.

11) Canola Seed Treatment Study

Objective: To evaluate rates of Green & Grow Agriplier seed treatment on canola growth and yield.

Y5

12) Winter Wheat Abscisic Acid Study

Objective: To evaluate foliar applications of abscisic acid for the prevention of lodging in winter wheat.

13) Winter Wheat Lodging Study

Objective: To compare the efficacy of commercial plant growth regulators for the prevention of lodging in winter wheat.

Y7

14) Winter Wheat Stripe Rust Screening Nursery

Objective: To evaluate experimental winter wheat lines for stripe rust resistance, yield and agronomic performance.

15) Winter Wheat Fungicide Evaluation Study

Objective: To evaluate fungicides and the effect of application timing for control of stripe rust in winter wheat.

16) Winter Wheat Intrastate Nursery

Objective: To evaluate winter wheat varieties and experimental lines for agronomic performance in environments representative of northwestern Montana.

P2

17) Spring Wheat Fungicide Evaluation Study

Objective: To evaluate fungicides and the effect of application timing for control of stripe rust in spring wheat.

A

18) Pea Variety Nursery

Objective: To evaluate pea varieties for yield and agronomic performance.

19) Lentil Variety Nursery

Objective: To evaluate lentil varieties for yield and agronomic performance.

D3

20) Nitrogen Use Efficiency Study

Objective: To evaluate variety specific nitrogen use response of dryland spring wheat**.**

R3

21) Optimizing Boron Fertilizer Maintenance of Alfalfa

Objective: To determine alfalfa response in yield and quality to boron application and timing.

R5

22) Wild Oat Herbicide Study

Objective: To evaluate herbicides for crop safety and the control of wild oats in spring wheat.

23) Downy Brome Herbicide Study

Objective: To evaluate herbicides for crop safety and the control of downy brome in spring wheat.

24) Intrastate Barley Nursery

Objective: To evaluate barley varieties and experimental lines for agronomic performance in environments representative of northwestern Montana.

25) Water Use Efficiency Study

Objective: To evaluate water use response of spring wheat varieties on yield and quality.

26) Nitrogen Use Efficiency Study

Objective: To evaluate variety-specific response of spring wheat on irrigated and dryland fine sandy loam soil.

Off-Station Experiments

Sm1 Advanced Spring Wheat Nursery

Objective: To evaluate advanced experimental lines for midge resistance and agronomic performance.

Effect of Actigard on Wheat Resistance to Orange Wheat Blossom Midge

Objective: To evaluate the efficacy of Actigard for the control of the midge in susceptible and resistant spring wheat cultivars.

E**ffect of Salicylic Acid on Wheat Resistance to Orange Wheat Blossom Midge**

Objective: To evaluate the efficacy of salicylic acid for the control of the midge in susceptible and resistant spring wheat cultivars.

Sm1 Preliminary Spring Wheat Nursery

Objective: To evaluate early generation experimental lines for midge resistance.

Midge and Parasitoid Monitoring Program

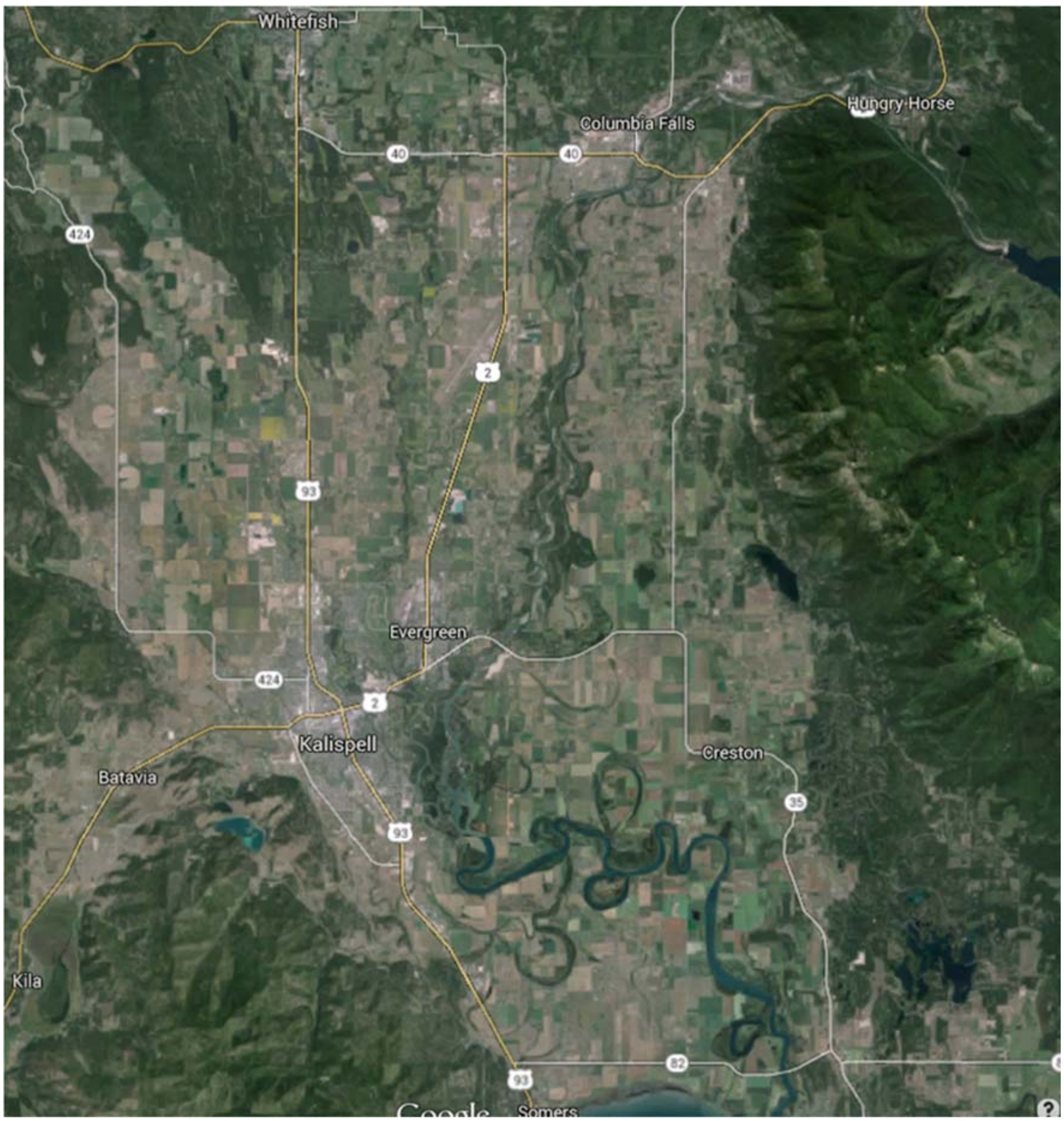
Objective: To determine the spacial distribution and emergence patterns of the midge and the parasitoid at 8 sites throughout Flathead County.

NWARC and Northwestern MT Agriculture's Aerial View

You are here!

Northwestern Ag Research Center (NWARC)

Image Source: Google™, August 2014.



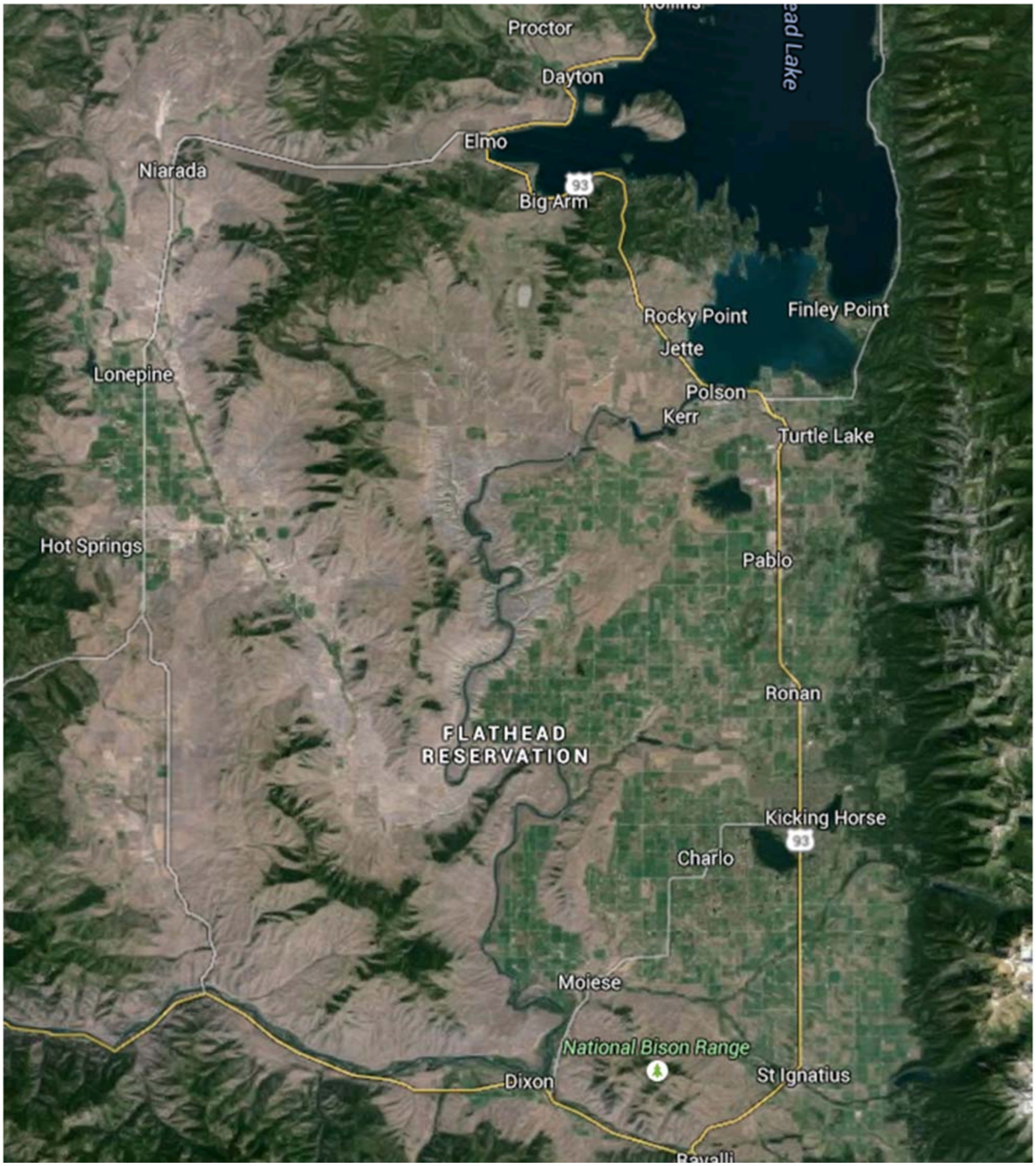
Flathead

Image Source: Google™, August 2014.

NWARC and Northwestern MT Agriculture's Aerial View

Lake County

Source: Google™, August 2014



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