

# **Wheat Breeding and Genetics at Michigan State University**

**SVREC**

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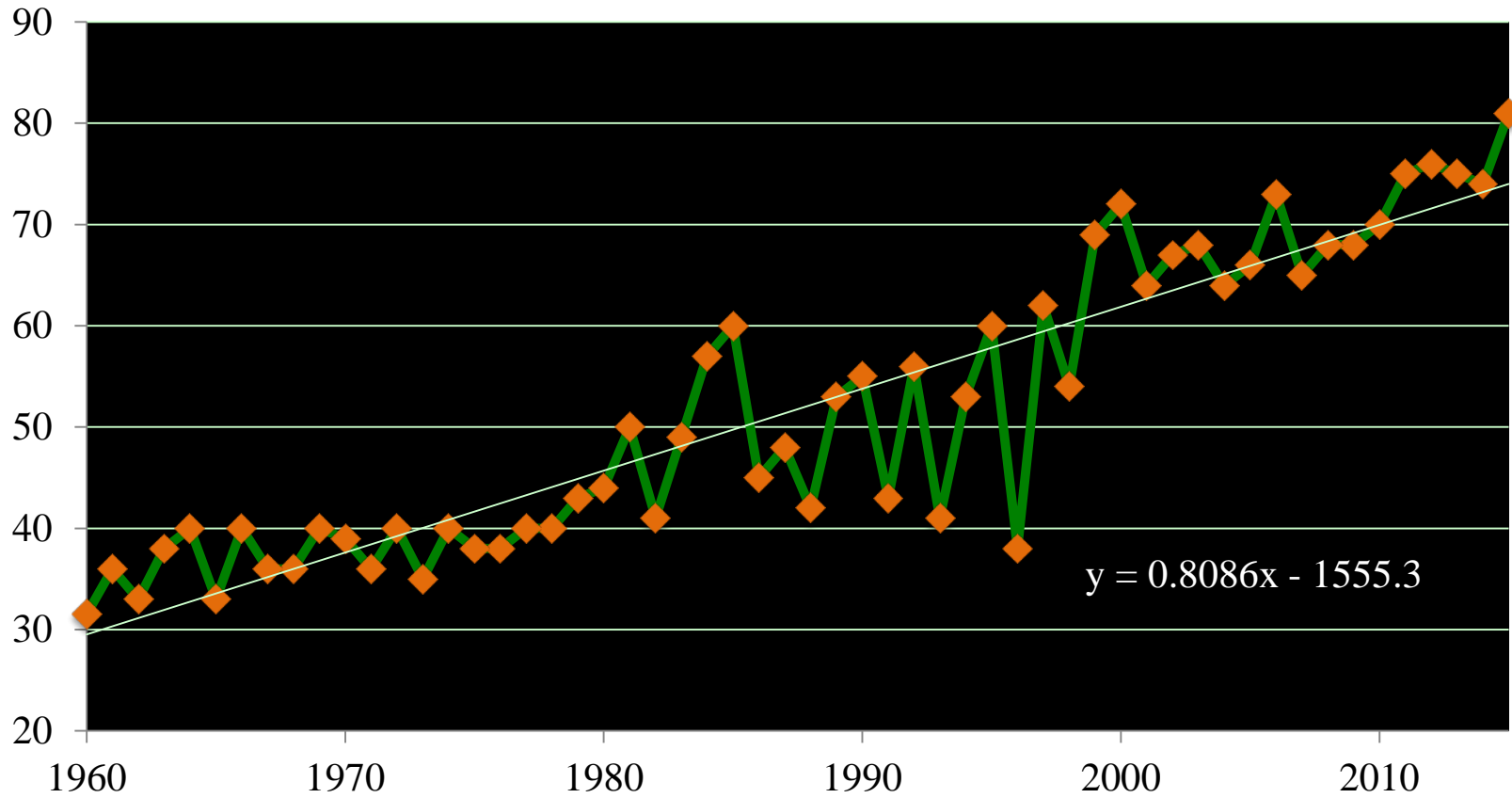
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# Yield Trends in Michigan 1960 to 2015



# 2014 and 2015 Soft Wheat: Harvested Acres

<b>State</b>	<b>2015</b>	<b>2014</b>	<b>2015v2014</b>
MISSOURI	610,000	740,000	-130,000
NORTH CAROLINA	570,000	770,000	-200,000
ILLINOIS	520,000	670,000	-150,000
OHIO	480,000	545,000	-65,000
<b>MICHIGAN</b>	475,000	470,000	5000
KENTUCKY	440,000	510,000	-70,000
TENNESSEE	395,000	475,000	-80,000

# 2014 and 2015 Soft Wheat: Total Bushels

<b>State</b>	<b>2015</b>	<b>2014</b>	<b>2015v2014</b>
MISSOURI	32,330,000	42,920,000	-0.25
N. CAROLINA	30,210,000	44,660,000	-0.32
ILLINOIS	33,800,000	44,890,000	-0.25
OHIO	32,160,000	40,330,000	-0.20
<b>MICHIGAN</b>	38,475,000	34,780,000	+0.11
KENTUCKY	32,120,000	36,210,000	-0.11
TENNESSEE	26,860,000	31,350,000	-0.14

# 2014 and 2015 Soft Wheat: Average Yield

<b>State</b>	<b>2015</b>	<b>2014</b>	<b>3 yr. average</b>
MISSOURI	53	58	56.0
N. CAROLINA	53	58	56.0
ILLINOIS	65	67	66.3
OHIO	67	74	70.3
<b>MICHIGAN</b>	81	74	76.7
KENTUCKY	73	71	73.0
TENNESSEE	68	66	68.3

# All US Wheat: 2015 Total Production

<b>State</b>	<b>Total</b>	<b>Avg. Yield</b>
NORTH DAKOTA	370,023,000	46.7
KANSAS	321,900,000	37.0
MONTANA	185,415,000	35.2
WASHINGTON	111,540,000	50.4
TEXAS	106,500,000	30.0
SOUTH DAKOTA	103,406,000	46.2
OKLAHOMA	98,800,000	26.0
MINNESOTA	88,294,000	59.9
IDAHO	87,850,000	77.4
COLORADO	79,635,000	37.1
NEBRASKA	45,980,000	38.0
OREGON	39,195,000	47.3
<b>MICHIGAN</b>	<b>38,475,000</b>	<b>81.0</b>

# MSU Wheat Breeding and Genetics Program Overview

## Early Generation Breeding

**Crossing**

~800 crosses  
15' – 16'

**F<sub>2</sub> bulks**

~600 popln.

...

**F<sub>5</sub> bulks**

~700 popln.  
mini-bulks  
in GH

**Headrow  
Nurseries**

~6800  
Ingham

## Yield Testing

**Preliminary  
Yield Trials**

1000  
Tuscola  
Ingham

**Advanced  
Yield Trials**

100 X  
5 locations

**State  
Performance  
Trials**

3 entries  
F2016

**Uniform  
Nurseries**

F1027  
F1026R

# FHB selection and fast cycling

Bulk selected  
 $F_3$  seed



Color sorting of FDK



Vernalize in  
germination boxes



Greenhouse advance

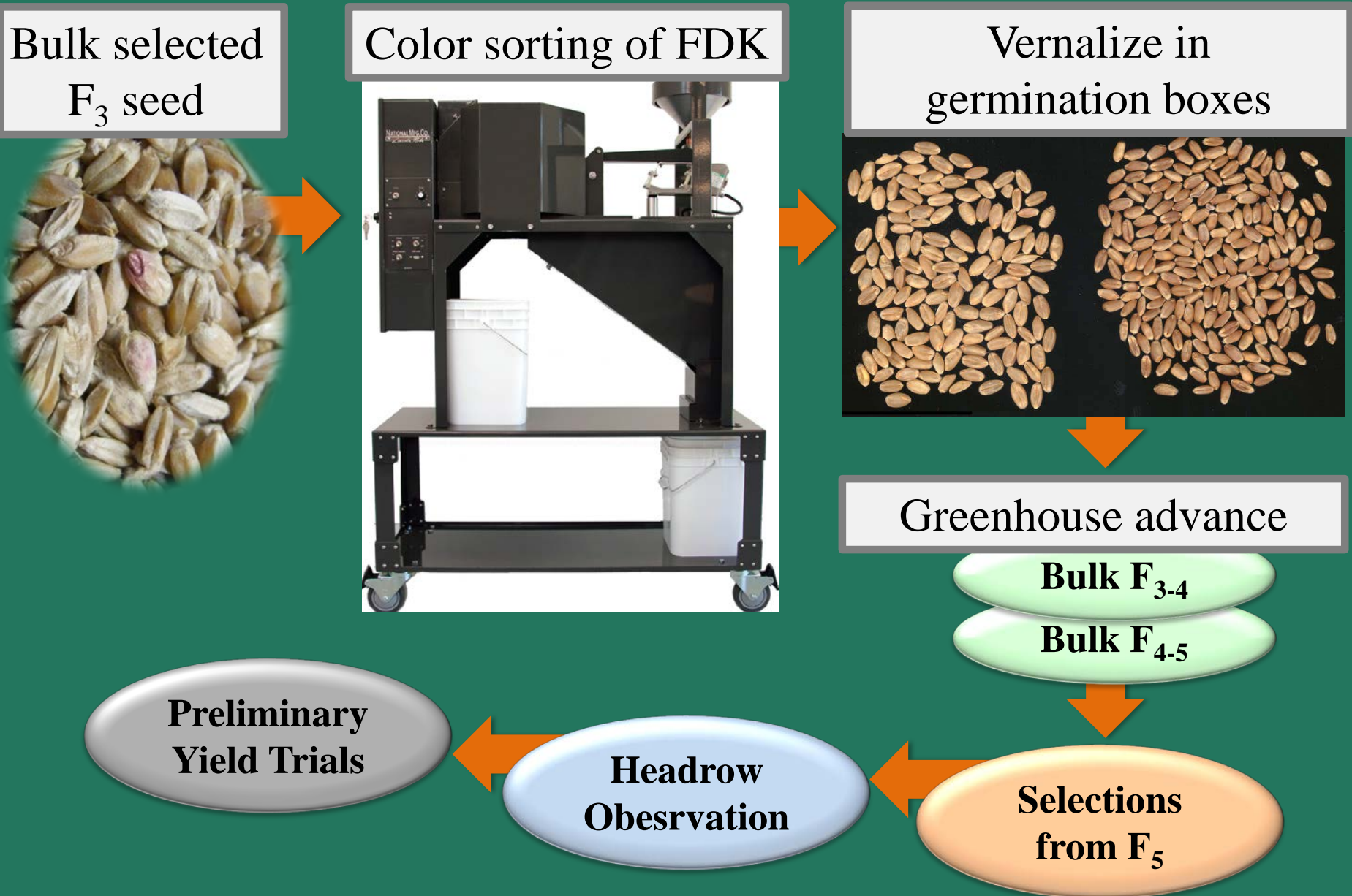
Bulk  $F_{3-4}$

Bulk  $F_{4-5}$

Preliminary  
Yield Trials

Headrow  
Observation

Selections  
from  $F_5$





Line	Pedigree	Yield, bu/Ac SVREC	FHB SVREC 0-9	FHB Nursery %Severtiy	PHS 0-9	Septoria 0-9, Mason	C. Stripe 0-9 Mason
MI14R0029	SE0010286-7 / VA05W-257	123.0	6	49.5	-	4	7
MI14R0354	E0028 / VA03W-409	122.5	7	49.5	-	4	7
MI14R0009	UNKNOWN	121.8	7	64.5	-	2	2
MI14R0008	UNKNOWN	121.5	8	66	-	-	-
MI14R0343	E0028 // Pioneer 25R47 / AgriPro Branson	118.5	6	72.5	-	3	6
MI14R0666	E0039/P 25R18	118.4	3	27	-	7	7
MI14W0298	Aubrey / MO 050699	116.3	3	17.5	6	4	2
MI14W0598	E0027/E5201	116.1	8	66	5	2	5
MI14R0025	SE0010286-7 / VA05W-257	115.5	9	64.5	-	-	-
P25R39	-	104.3	5	-	-	5	5
AC Mountain	-	99.8	8	64.5	9	5	5
Ambassador	P27W37/D1148	96.5	9	70	9	8	8



# High Management Input Costs

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<b>Product</b>	<b>Rate per Acre</b>	<b>Cost per Acre</b>	<b>Base</b>
28% Liquid Nitrogen	30.0 lb.	\$13.20	\$0.44 per lb.
Quilt Excel	12.0 oz.	\$14.16	\$150 per gal.
Prosaro	7.4 oz.	\$18.69	\$400 per gal.
Three Custom Applications	-	\$21.00	-
<b>Total Cost per Acre</b>		<b>\$67.05</b>	

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# Varieties most responsive to management

<b>Variety</b>	<b>Color</b>	<b>Hi</b>	<b>Conv</b>	<b>Response</b>	<b>Group</b>
DF 105R	Red	96.7*	72.2	24.4	<i>a</i>
AgriMaxx-413	Red	100.9	80.2	20.7	<i>ab</i>
DF 109R	Red	94.1	74.2	19.9	<i>abc</i>
Jupiter	White	91.6	71.8	19.7	<i>abc</i>
RS 972	Red	97.8	79.6	18.3	<i>abcd</i>
9242W	White	92.8	74.7	18.1	<i>abcde</i>
DF 112R	Red	84.7	66.8	17.9	<i>abcde</i>
RS 907	Red	84.5	66.6	17.9	<i>abcde</i>

*\*Values are in bushels per acre*

# Varieties with intermediate response to management

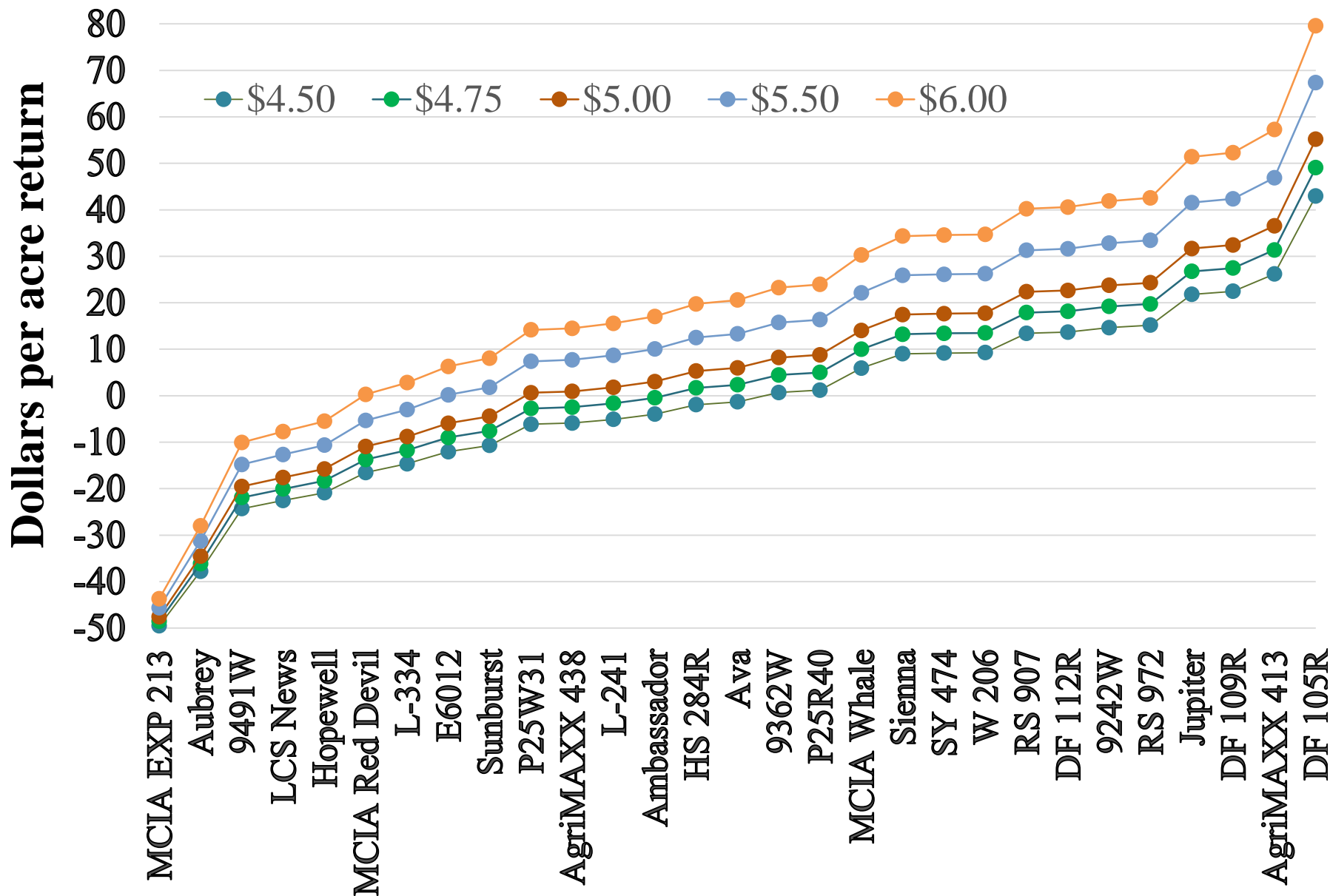
Variety	Color	Hi	Conv	Response	Group
W 206	Red	99.7	82.7	17.0	<i>bcdef</i>
SY 474	White	87.4	70.4	16.9	<i>bcdef</i>
Sienna	Red	88.8	72.0	16.9	<i>bcdef</i>
MCIA Whale	Red	93.1	76.9	16.2	<i>bcdefg</i>
P25R40	Red	96.1	80.9	15.2	<i>bcdefg</i>
9362W	White	87.5	72.5	15.0	<i>bcdefg</i>
Ava	White	90.7	76.1	14.6	<i>bcdefg</i>
HS 284R	Red	90.8	76.3	14.5	<i>bcdefg</i>
Ambassador	White	77.1	63.1	14.0	<i>bcdefg</i>
L-241	Red	89.6	75.8	13.8	<i>bcdefg</i>
Agrimaxx-438	Red	88.6	75.0	13.6	<i>cdefg</i>
P25W31	White	83.6	70.1	13.5	<i>cdefg</i>
Sunburst	Red	97.7	85.2	12.5	<i>defgh</i>
E6012	White	81.0	68.8	12.2	<i>defgh</i>
L-334	Red	79.6	67.9	11.6	<i>defgh</i>
MCIA Red Devil	Red	92.6	81.4	11.2	<i>efgh</i>

# Varieties least responsive to management

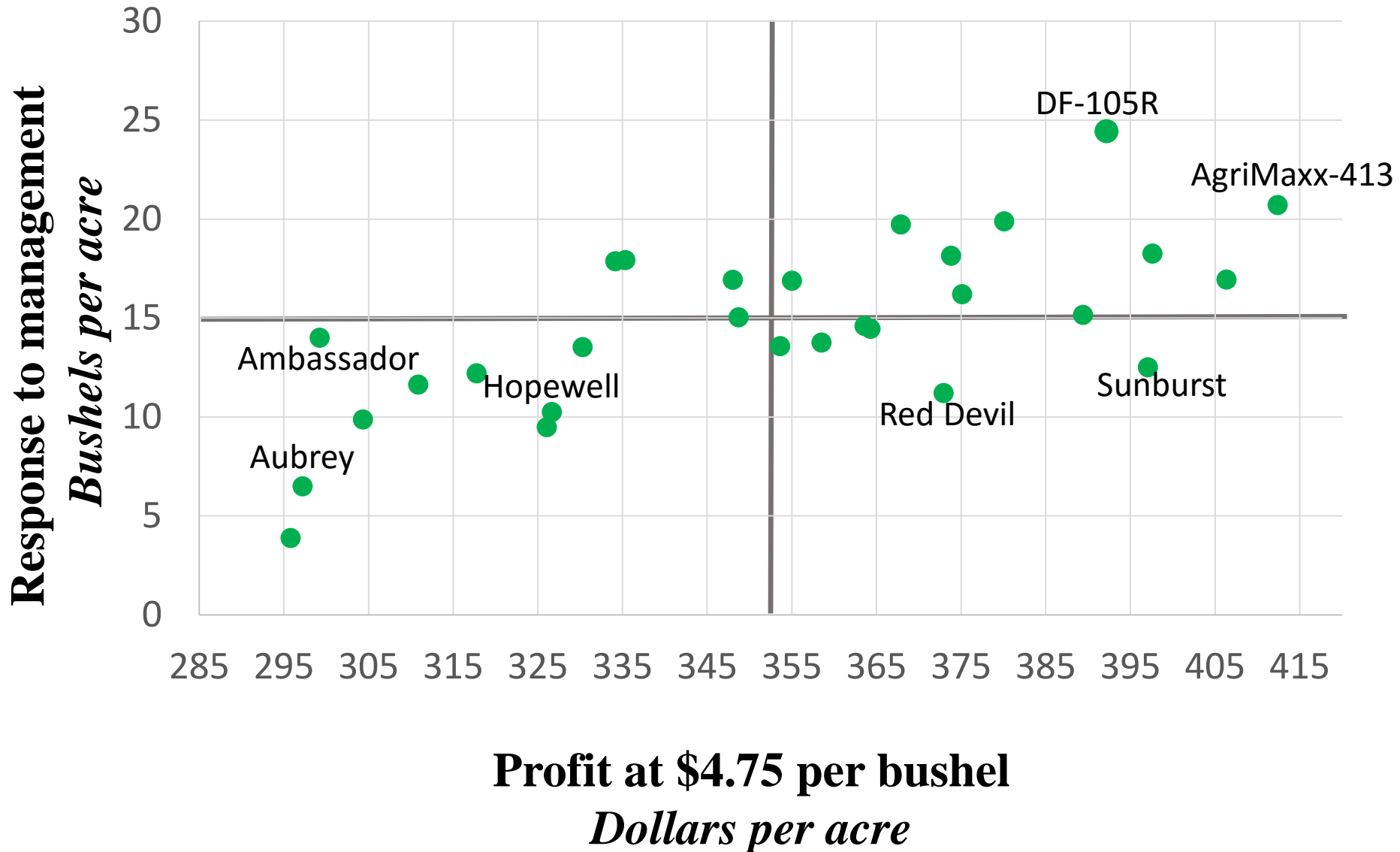
<b>Variety</b>	<b>Color</b>	<b>Hi</b>	<b>Conv</b>	<b>Response</b>	<b>Group</b>
Hopewell	Red	82.9	72.6	10.2	<i>fghi</i>
LCS News	Red	78.2	68.3	9.9	<i>ghi</i>
9491W	White	82.8	73.3	9.5	<i>ghi</i>
Aubrey	White	76.7	70.2	6.5	<i>hi</i>
MCIA EXP 213	Red	76.4	72.5	3.9	<i>i</i>

# Return on Investment for High Management Inputs

## *Dollars per acre return at variable wheat prices*



# Variety Profitability Under High Management



Thank you for your support!



MICHIGAN WHEAT PROGRAM



Project GREEN



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