Fungicides for Wheat Stripe Rust Disease Control

December 11, 2012

Doug Munier, Jerry Schmierer & Kent Brittan

- Symptoms
- When to spray Fungicides
- When Not to Spray

Wheat Stripe Rust

- Symptoms

Wheat Stripe Rust


LIBERTY
2001

When to Spray Fungicides

- At the first sign of the disease, <u>usually</u> in late March to early April

Wheat Stripe Rust

Sacramento Valley 2003-09

17 Trials

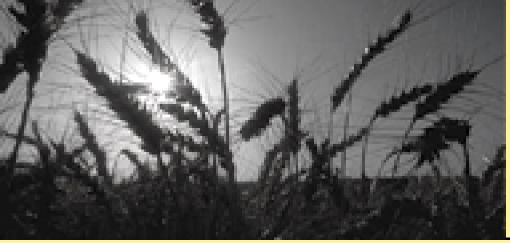
Over 7 Years

8 fungicides

26 unique treatments

Each treatment entered in one or more trials from 1 to 19 times over the 7 year period.

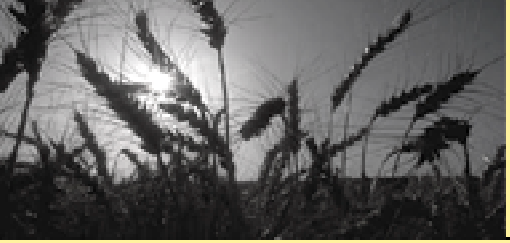
Treatment (1st # rate & 2nd # timing)	# reps	% Control
Untreated Control	68	100
Quilt + Quadris 14+6.2 8+10.5	11	102
Prosaro 8.2 10.5	4	113
Prosaro 6.5 10.5	4	115
Stratego 8.0 8	32	121
Headline 9.0 10.5	8	122
Quadris 4.0 8	24	130
Tilt 4.0 8	40	130
Quadris 4.0 10.5	35	132
Quadris 8.0 10.5	48	132
Stratego 8.0 10.5	16	133
Quilt 14.0 10.5	8	134
Quadris 6.2 10.5	76	135
Quadris 6.2 8	16	136
TwinLine 9.0 10.5	8	138
Headline 6.0 10.5	58	138
Headline 6.0 8	40	140
Quilt 14.0 8	39	140
Headline 9.0 8	39	141
Stratego 10.0 8	40	143
Stratego 10.0 10.5	20	148
TwinLine 7.0 10.5	4	160
Quadris + Headline 4+6 10.2 + 10.5	4	160
Stratego + Stratego 8+8 8 + 10.5	4	223
Quadris + Quadris 4+4 8 + 10.5	8	238
Stratego + Quadris 8+4 8 + 10.5	4	252



2003 to 2009

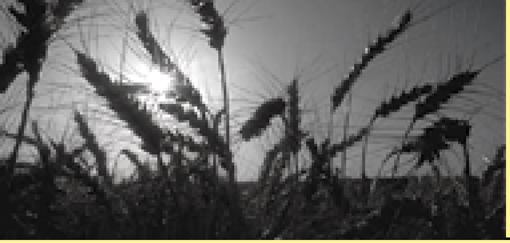
Summarize by:

- Year



Yield by Year for All Fungicides, All Rates, & All Timings

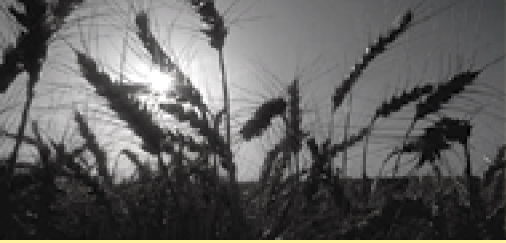
Year	# reps	All Fungicides (% control)
2003	48	123
2004	140	103
2005	159	133
2006	136	160
2007	60	131
2008	40	144
2009	40	118



2004 to 2006

Summarize by:

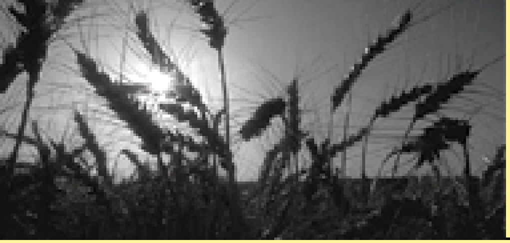
- Year
- **Timing of Application**



2004 to 2006

Fungicide Timing

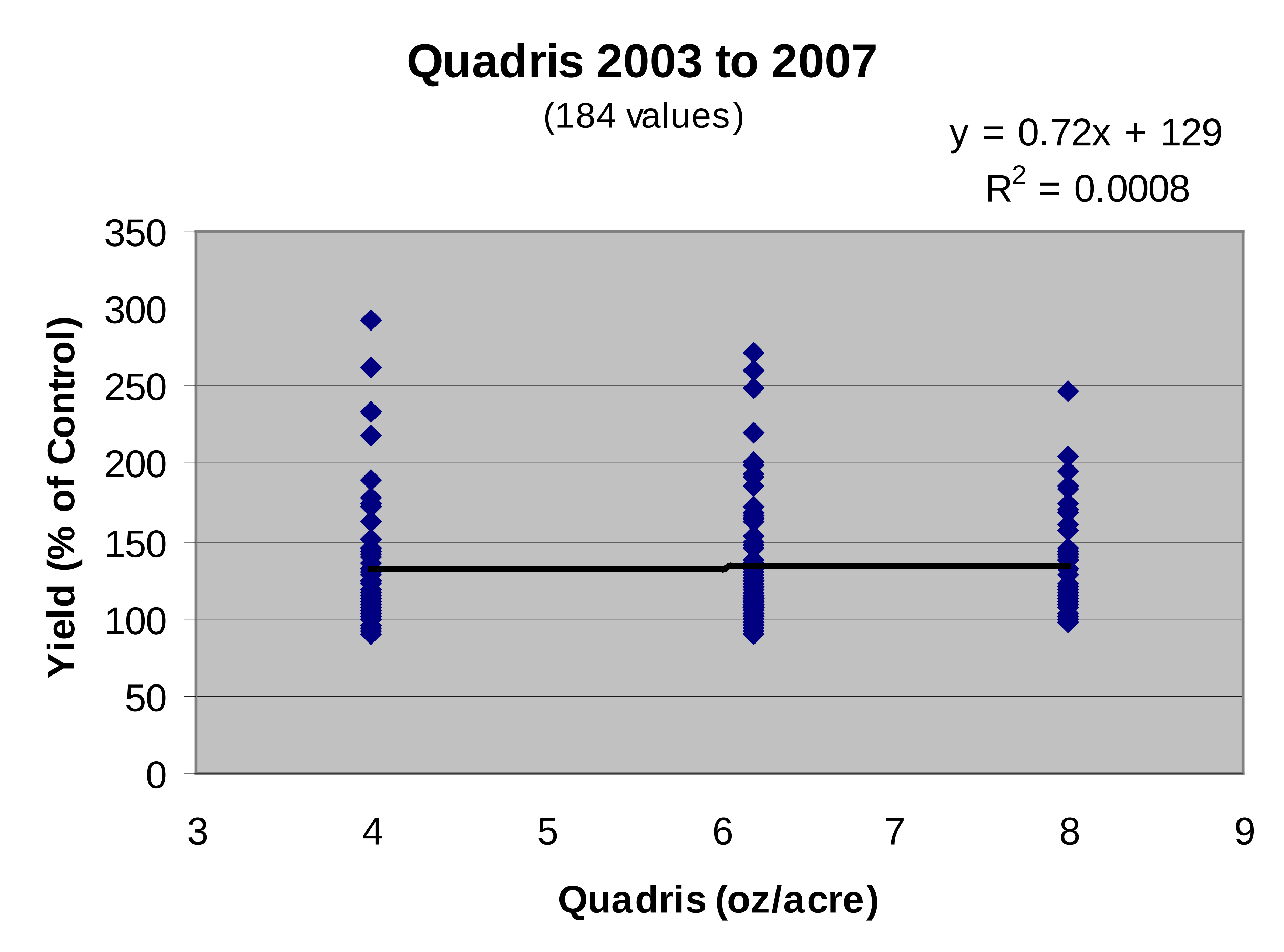
Fungicide	# reps	Yield (% of untreated) Early (Feeks 8.0)	Later (Feeks 10.5)	Significance
Quadris	163	132	133	NS
Headline	113	140	139	NS

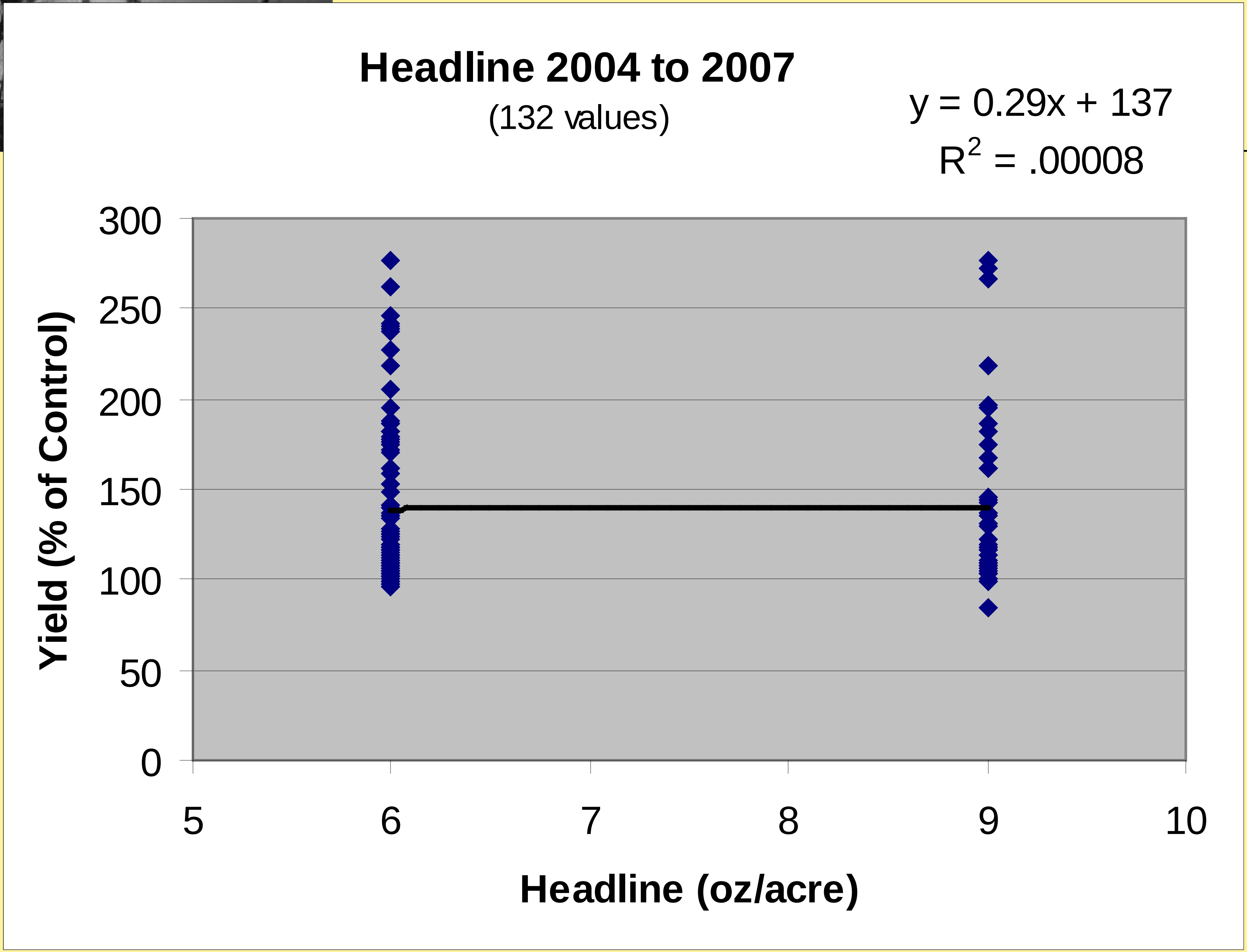


2003 to 2007

Summarize by:

- Year
- Timing of Application
- **Rate of Fungicide**

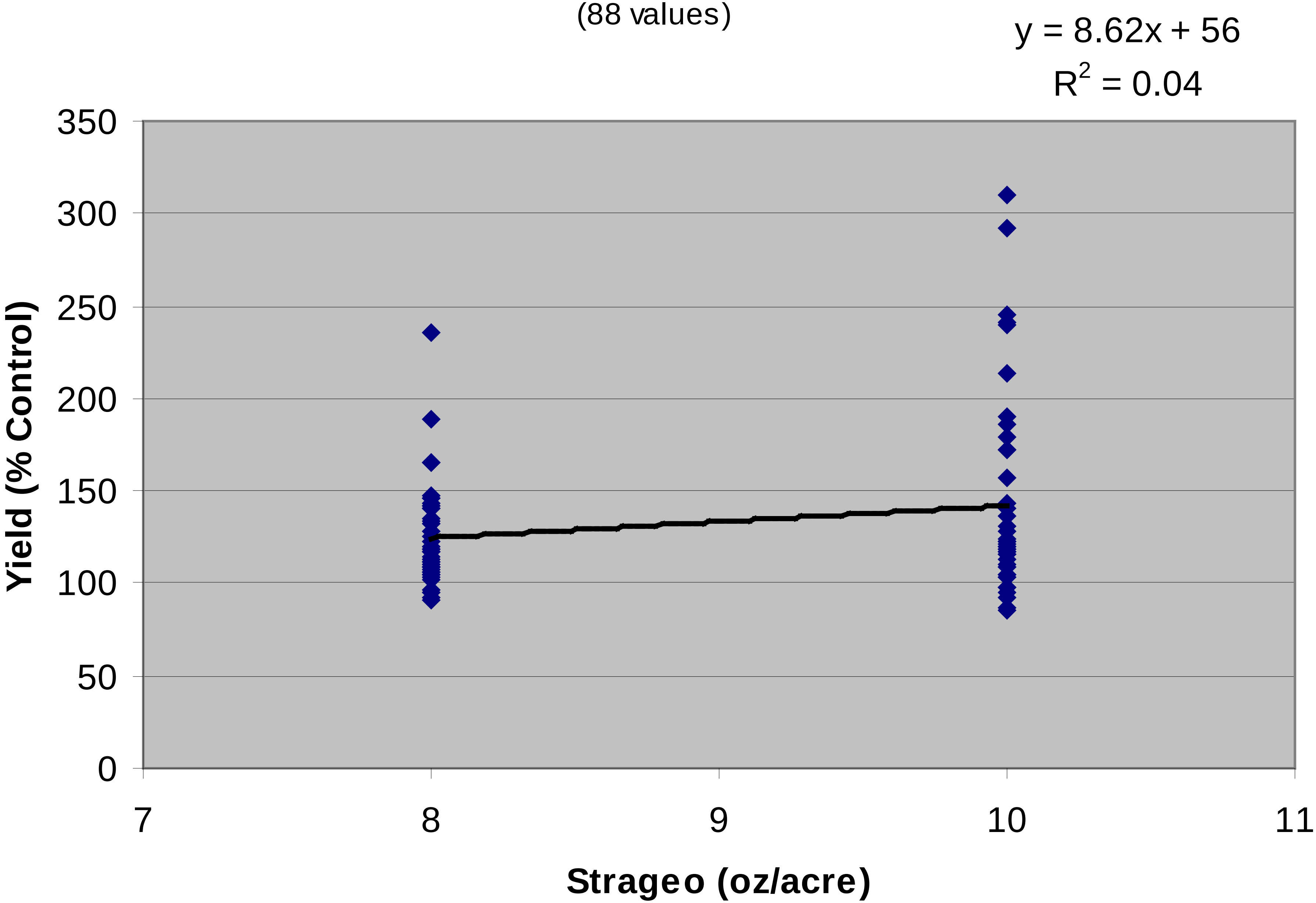

Quadris 2003 to 2007
(184 values)
y = 0.72x + 129
R2 = 0.0008
Yield (% of Control)
0
50
100
150
200
250
300
350
3
4
5
6
7
8
9
Quadris (oz/acre)

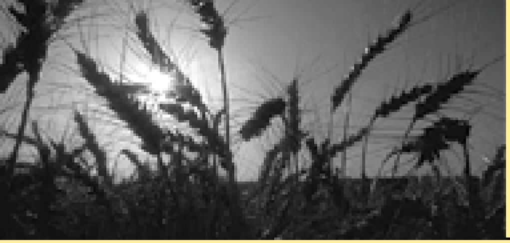


Headline 2004 to 2007
(132 values)
y = 0.29x + 137
R2 = .00008
300
250
200
150
100
50
0
5
6
7
8
9
10
Yield (% of Control)
Headline (oz/acre)

Stratego 2004 to 2007

(88 values)

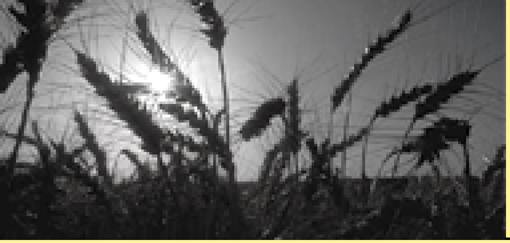




2003 to 2009

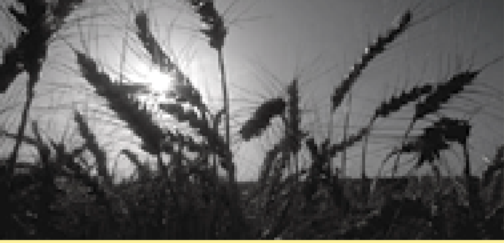
Summarize by:

- Year
- Timing of Application
- Rate of Fungicide
- **Fungicide**



2003-09 by Fungicide

Treatment	# reps	% Control Yield	Stats
Untreated Control	68	100	X
Prosaro	8	114	?
Tilt	40	130	X
Quadris	199	133	X
Stratego	108	136	X
Headline	145	138	X
Quilt	47	139	X
TwinLine	12	145	XX
Fungicide + Fungicide	31	180	X



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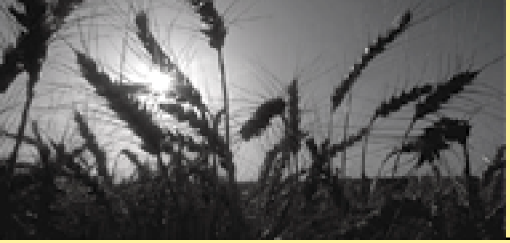
Single Fungicide Average	551	136	



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Sacramento Valley 2003-09

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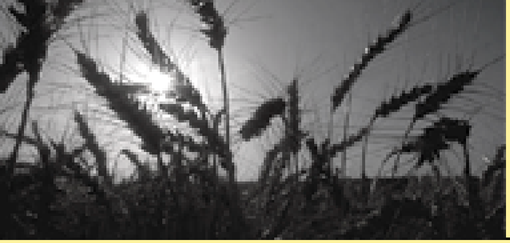
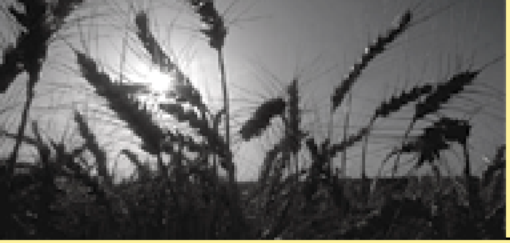


20003 - 2009

With single fungicide applications no significant differences in:

- **Timing of application**
- **Rate of fungicide**
- **Fungicide material**

Significant additional increased yields with sequential applications of fungicides under high levels of stripe rust



2012 Stripe Rust Trial

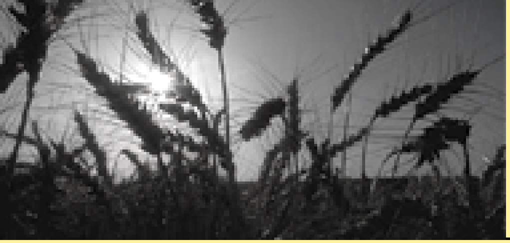
- **April 9th fungicide treatment at Feeks 10.1**
- **Little rust until April 23rd (typical)**
- **May 7th, less than 30 DAT, leaves were turning brown from moisture stress from a year with little mid-winter rain & no irrigation**

Treatment	# reps	Yield (lb/A)	Statistics
Untreated Control	4	100	X
Priaxor - 4 oz	4	111	XX
Twinline - 9 oz	4	111	XX
Headline - 6 oz	4	117	X

When Not to Spray:

1) Varietal resistance holds

Wheat Stripe Rust



Stripe Rust Ratings

Variety	2008 Stripe Rust: Average (4 Loc)		Colusa	UC Davis	Sac-SJ Delta	Kern
WHEAT						
ANZA	5.2	(18)	7.0	6.8	4.8	2.3
EXPRESS	5.7	(19)	7.3	7.0	6.8	1.8
SUMMIT	6.7	(22)	8.0	8.0	8.0	2.8
BLANCA GRANDE	6.1	(21)	8.0	7.5	7.8	1.0
MIKA	2.1	(13)	3.0	3.3	1.0	1.0
DASH 12	2.9	(15)	3.3	3.3	4.0	1.0
CLEAR WHITE	3.8	(17)	5.3	4.0	5.0	1.0
SOLANO	5.7	(19)	7.8	6.8	7.3	1.0
PATWIN	1.0	(1)	1.0	1.0	1.0	1.0
JOAQUIN	3.6	(16)	3.8	5.0	3.3	2.3
CAL ROJO	1.1	(7)	1.0	1.0	1.3	1.0
OTIS	1.9	(12)	2.0	3.5	1.3	1.0
LASSIK	1.0	(1)	1.0	1.0	1.0	1.0
EXPRESSO	1.0	(1)	1.0	1.0	1.0	1.0
REDWING	1.2	(10)	1.8	1.0	1.0	1.0
BLANCA ROYALE	1.0	(1)	1.0	1.0	1.0	1.0
BLANCA FUERTE	1.0	(1)	1.0	1.0	1.0	1.0
TRITICALE						
TRICAL BRAND 105	1.0	(1)	1.0	1.0	1.0	1.0
TRICAL BRAND 118	1.1	(7)	1.0	1.0	1.3	1.0
TRICAL BRAND 98	2.4	(14)	2.0	3.0	3.3	1.5
RSI 01T40207	1.3	(11)	1.3	1.3	1.8	1.0
WB ACS 55304	1.1	(9)	1.0	1.5	1.0	1.0

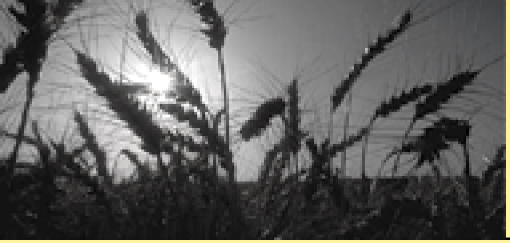
When Not to Spray:

1) Varietal resistance holds

or

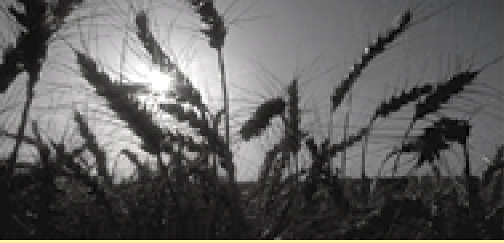
2) Disease starts very late

Wheat Stripe Rust



2009 Stripe Rust Trial

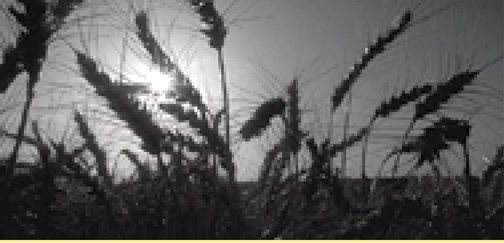
Treatment	# reps	Yield (lb/A)	Statistics
Quilt - 14 oz	4	4873	X
Untreated Control	4	5100	X
Headline - 9 oz	4	5229	X
Prosaro - 8.2 oz	4	5238	X
Stratego - 8 oz	4	5244	X
Prosaro - 6.5 oz	4	5280	X
Quadris - 4 oz	4	5310	X
Twinline - 9 oz	4	5397	X
Stratego - 10 oz	4	5397	X



2009 Fungicide Averages

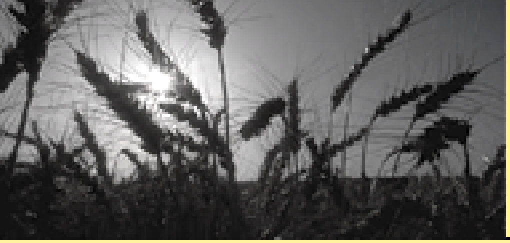
- **May 20th 0 to 10 % leaf infection with fungicides**
- **April 16th fungicide treatment at Feeks 10.5**
- **Little rust until May 20th**
- **May 20th 60 % for untreated control**

Treatment	# reps	Yield (lb/A)	Statistics
All Fungicides	32	5257	X
Untreated Control	4	5100	X



Factors influencing fungicide application profitability:

- **Year**
  - **Wet vs. Dry**
  - **High vs. Low disease incidence**
  - **Early vs. Late plantings**
- **Wheat Variety**
  - **Level of resistance compared to the current stripe rust strains**
- **Price of Wheat**
  - **Higher priced wheat returns more $ for fungicide increases**
- **Fungicide**
  - **Timing of application, rate & cost**

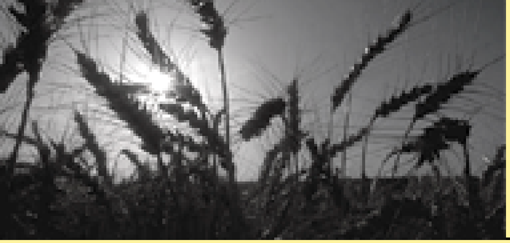


2003 – 2009

Overall average results of 17 trials over 7 years, when stripe rust is treated as disease starts with a single application.

136 % of control grain yields

= 1410 lbs/acre grain yield increase & a 4 lb/bushel increase



Wheat Stripe Rust Information

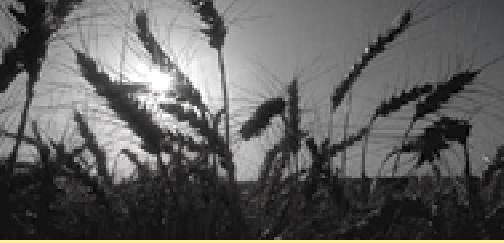
Australian New South Wales – “Stripe Rust: Understanding the disease in wheat”

Google “Stripe Rust: Understanding the disease in wheat” to get the 12 page pdf.

Adding Nitrogen to Fungicide Sprays


Headline + UN-32

Headline + Liquid Urea



2008 Glenn County Trial

Average of Headline – Stratego – Quadris

(12 replications per treatment)

Treatment	Bushel Wt.	Yield	Protein
	(lbs)	(lb/A)	(%)
Fungicide	61.0	6906	12.8
Fungicide + UN-32 (18# N/A)	60.6	6655	12.7
Fungicide + Liquid Urea (30# N/A)	61.5	7002	12.7
$LSD_{.05}$	1.9	698	NS