



Rhizoctonia solani

Extent of the problem and control measures.

Michigan Sugar Company

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Rhizoctonia solani

- Serious root disease
- Severe in some areas
- In almost every field
- First tested a tolerant variety in 1990
- First tested Quadris for Rhizoctonia control in 1999

Rhizoctonia Strains

- AG 2-2 – Root and Crown Rot
 - 2-2 IV – Main strain in the past
 - 2-2 IIIB – Becoming more common
 - 50% is now IIIB
 - 2-2 IIIB
 - Corn is a host
 - Stronger strain – more aggressive



Crown Rot



Root Rot



Extent of the Problem

Agriculturist Survey

- Use Susceptible variety and no Quadris
- Use Susceptible variety and 1 Quadris App
- Use Susceptible variety and 2 Quadris Apps

- Use Tolerant variety and no Quadris
- Use Tolerant variety and 1 Quadris App
- Use Tolerant variety and 2 Quadris Apps



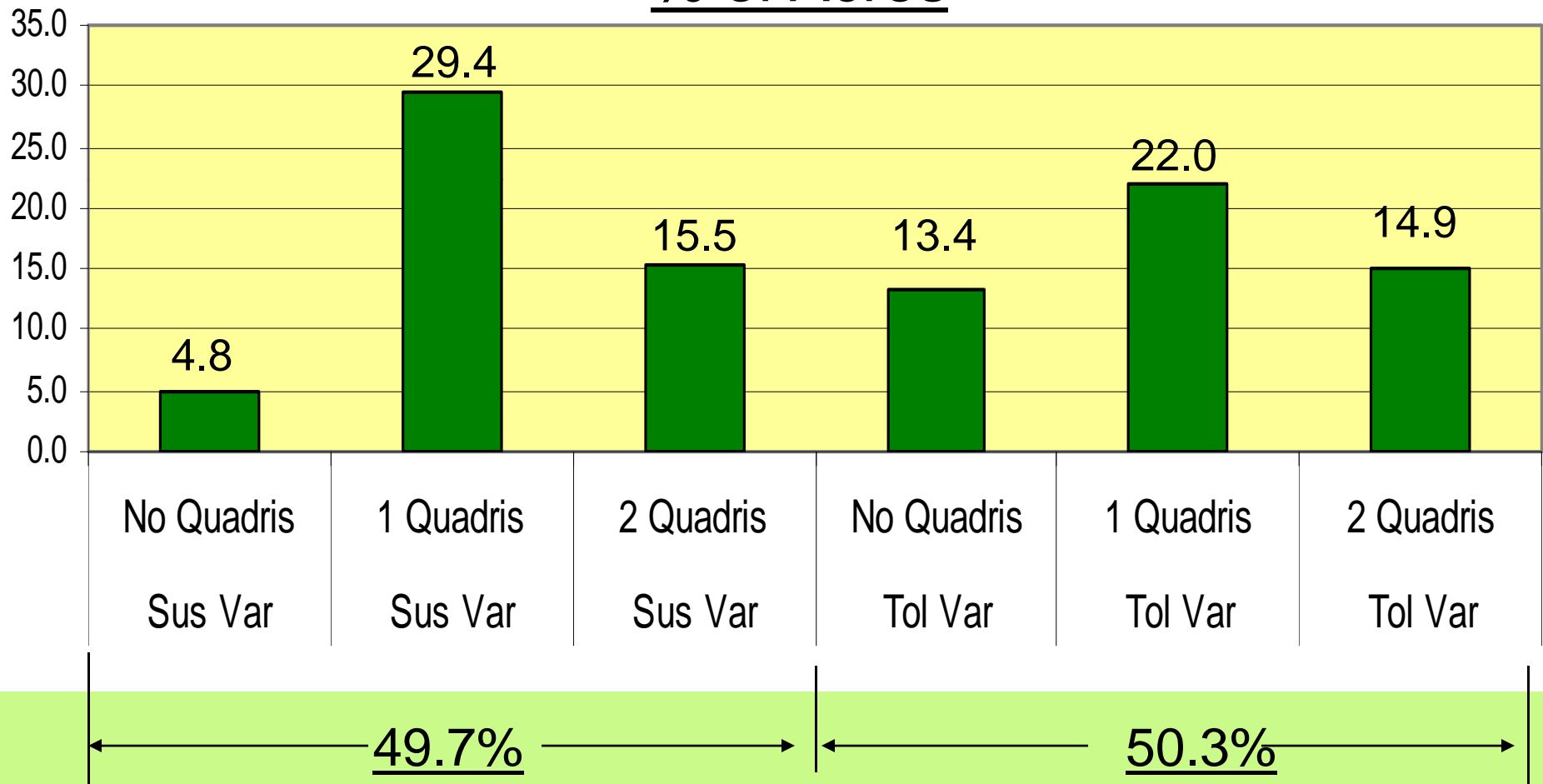
Survey Results

- Agriculturalists areas (15)
 - Only 3 areas had any acres with “no” Rhizoctonia
 - Susceptible variety & no Quadris
 - 78% in Ontario, Canada
 - 1 area, all Acres need Tolerant variety + 1 or 2 Quadris applications
 - 30% of the acres - 2 Quadris applications



Survey Results

% of Acres





Methods of Control

- Cultural controls
- Return crop residue
 - Soil health
 - Longer rotations
- Varieties with tolerance
- Fungicide applications



Previous Crop

Host

Strain AG 2-2 IV

Dry beans, Soys

Strain AG 2-2 IIIB

Also Corn

Corn was recommended in the past

AG 2-2 IIIB

50% now

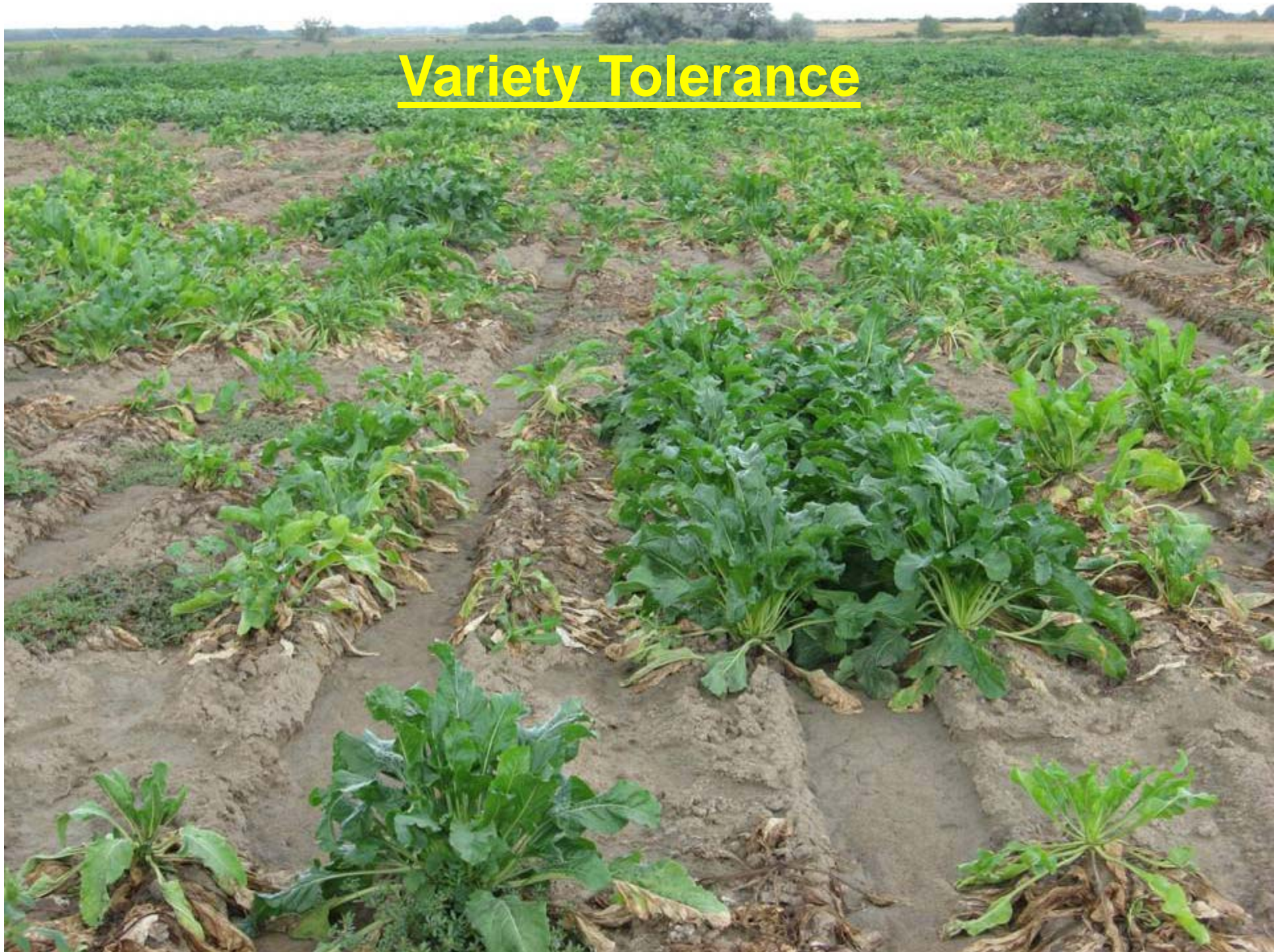
Non-Host Wheat (clover, alfalfa)

Improve Soil Health Cover Crops

- Improved soil structure & drainage
- Increase organic matter
- Erosion control
- Oil seed radish
 - Cyst nematode suppression
- Clovers planted in wheat
 - Produce nitrogen in soil



Variety Tolerance



Variety Selection

- One variety does not have all traits
 - Varieties that produce the most RWST and RWSA are the most susceptible to Rhizoctonia
 - The most tolerant varieties do not meet our approval standards – Special Approval



2010 Trials

Inoculate .3 gm/foot
AG 2-2

Quadris Rate

- 22 inch rows
– 14.25 fl oz/acre



Rhizoctonia Control Products Compared

Quadris FL

Moncut DF

Proline SC

ActinoGrow AG

Topsin M

Headline EC

In-furrow

3.5 inch T-band

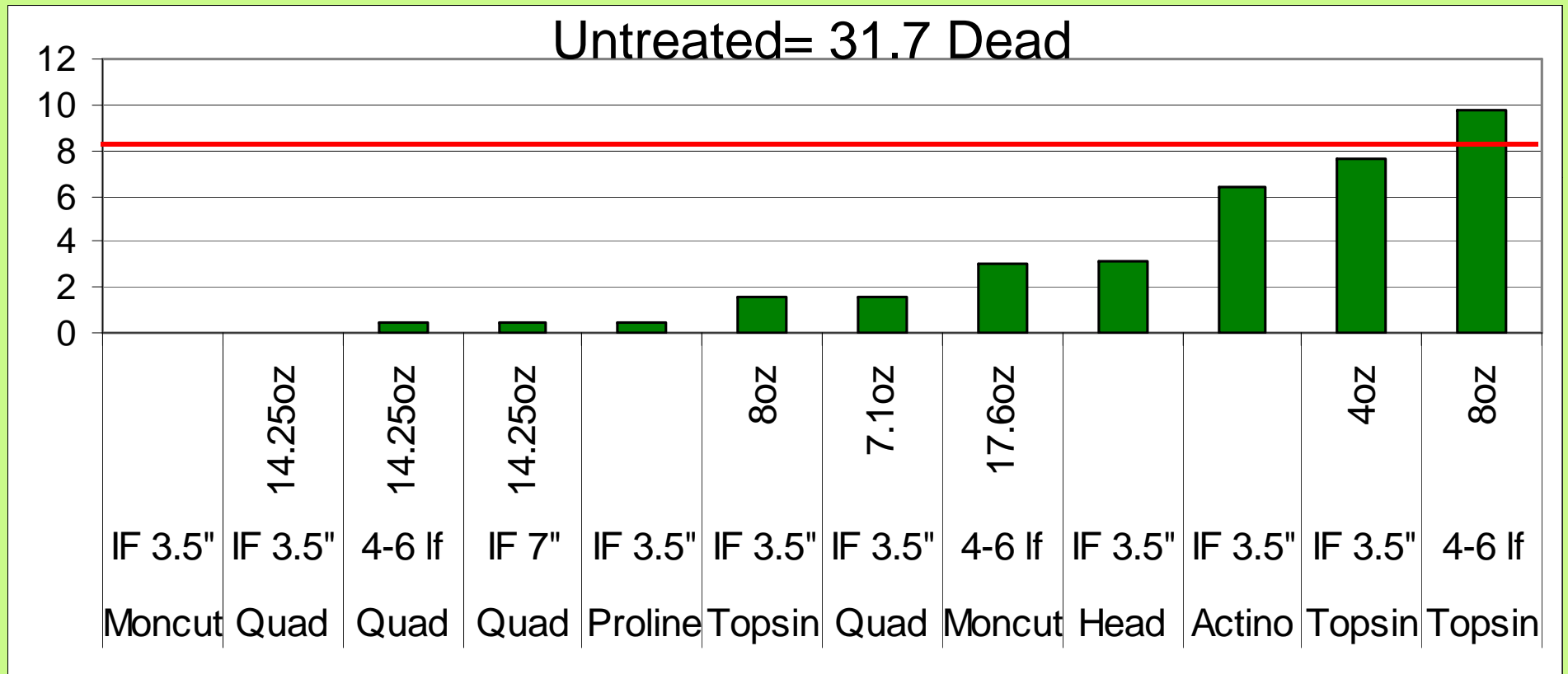
Foliar

4-6 leaf size



Rhizoctonia Control Products Compared

Dead Beets/100'



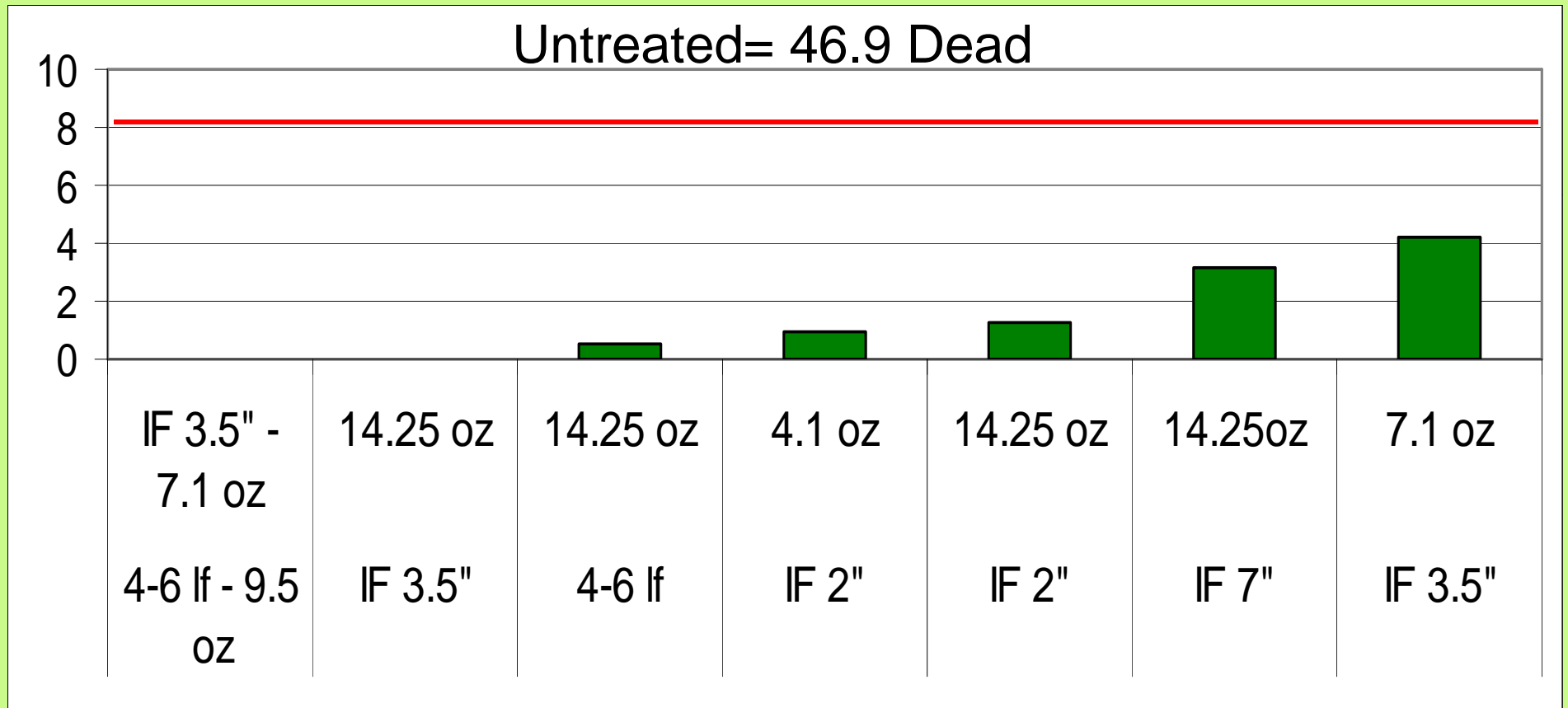
In-furrow Quadris Rates & Band Widths

- In-furrow, T-band
 - Band width- 2, 3.5 and 7 inch
- Foliar- 4-6 leaf



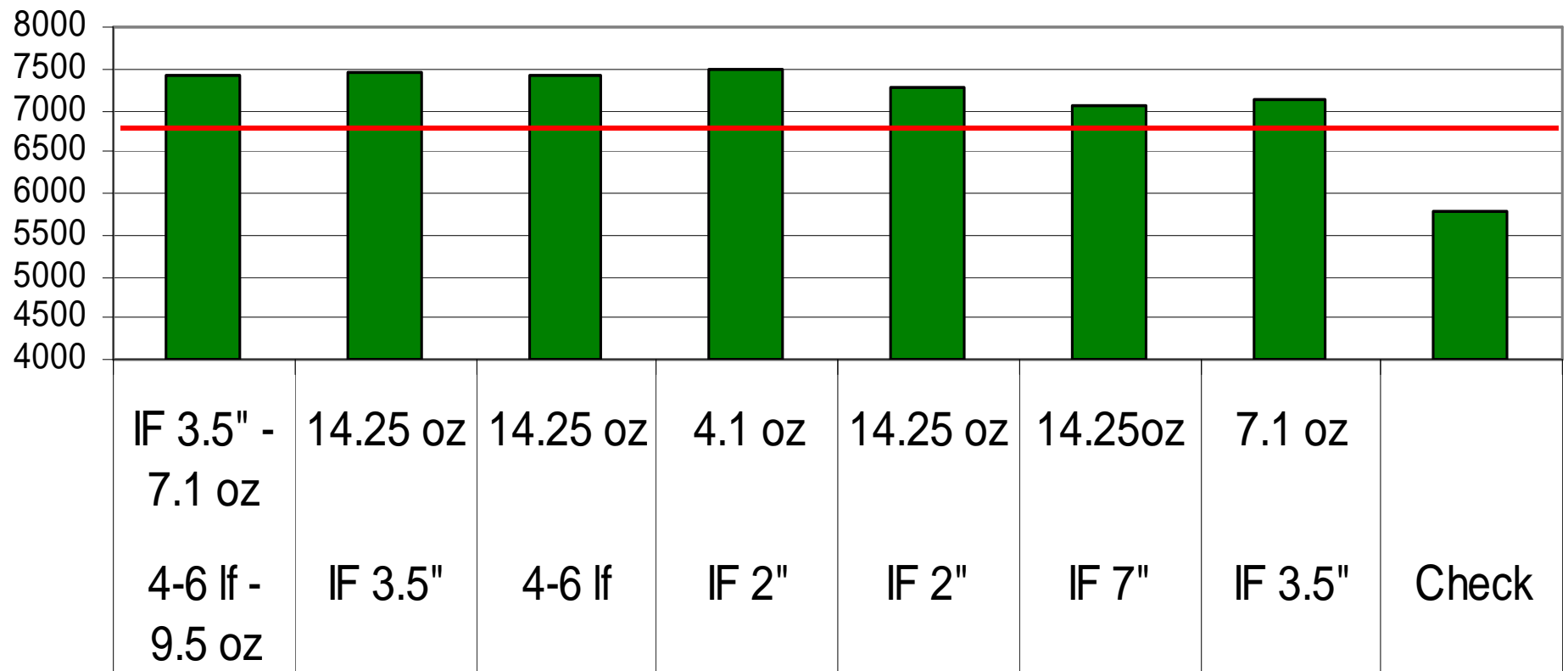
In-furrow Quadris Rates & Band Widths

Dead Beets/100'



In-furrow Quadris Rates & Band Widths

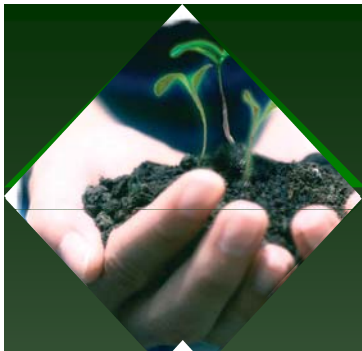
Recoverable Sugar per Acre



Quadris

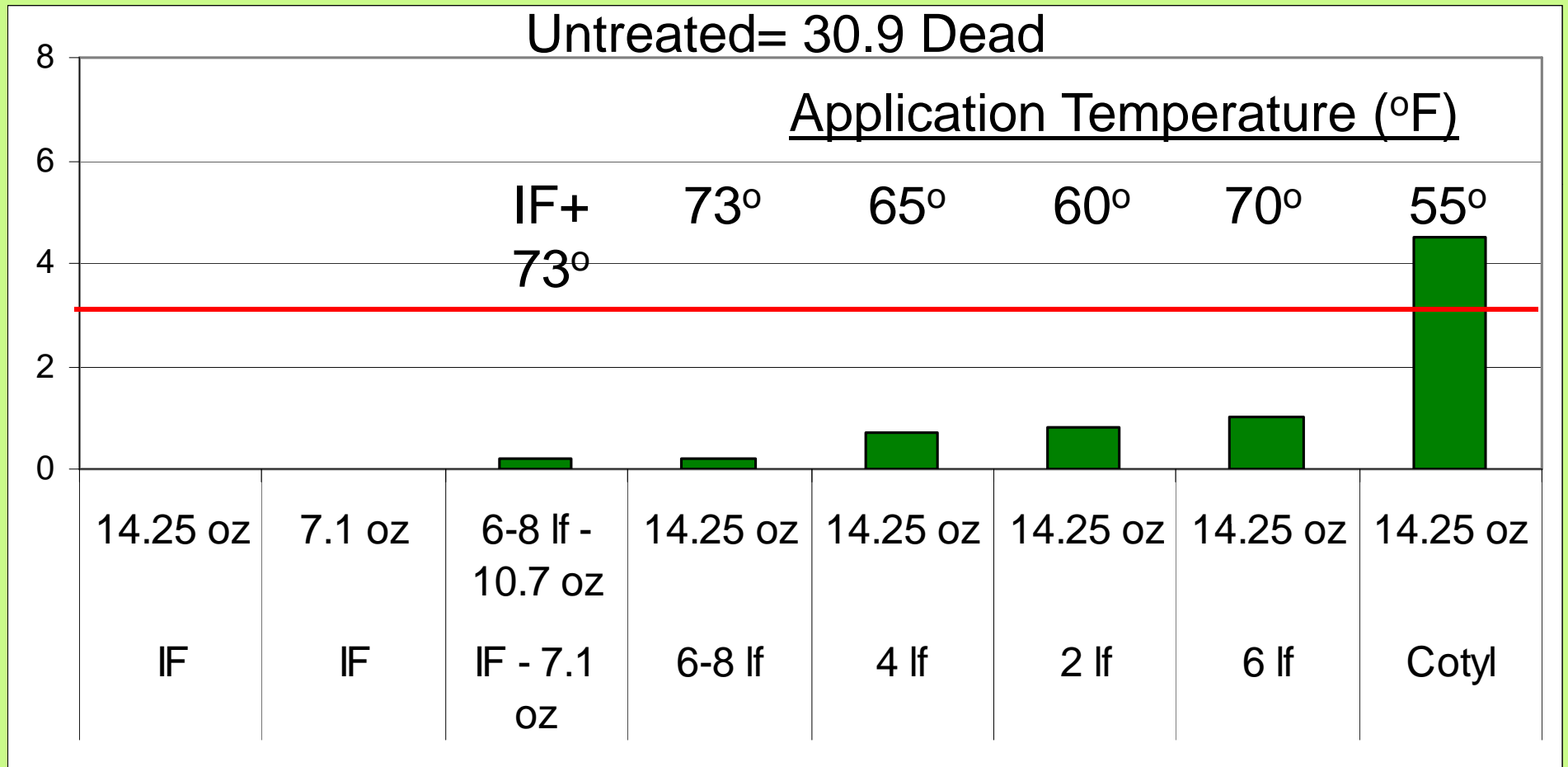
Application Timings

- In-furrow- 3.5 inch T-band
 - 14.25 and 7.1 fl oz/acre
- Foliar-
 - Cotyledon, 2, 4, 6, and 6-8 leaf size
 - 14.25 fl oz/acre



Quadris Application Timings

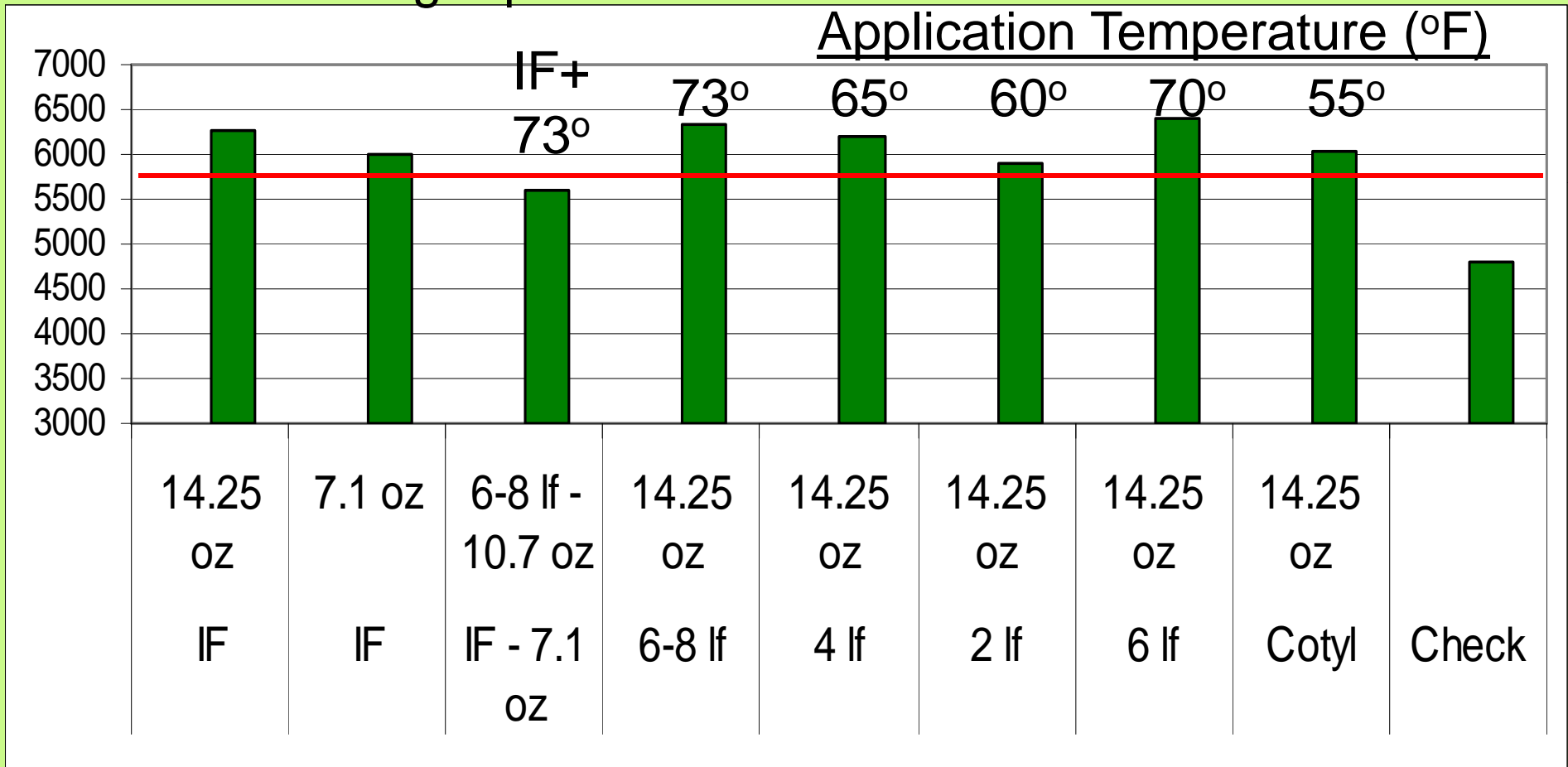
Dead Beets/100'



Quadris

Application Timings

Recoverable Sugar per Acre



Fungicide Recommendations

- Quadris
 - Post emergence Foliar application
 - 4-8 leaf – best time varies with soil temperature
 - In-furrow T-band
 - At least as good as a foliar application and is not affected by temperature later



Recommendations for 2 Applications

Quadris – 2 applications

- Moderate Rhizoc – Susceptible Variety
- High Rhizoc – Tolerant Variety
 - In-furrow + Foliar 6-8 leaf
or
 - Two Foliar
2-4 and 6-8 leaf





Foliar Recommendations

- Do not cut rates
- 7 inch band
- Do not broadcast
- 4-8 leaf size
- Do not mix with oils (MSO, ECs)

Foliar Application

7 inch band

Quadris Rates (fl oz/A) at Row Spacings

30"	28"	24"	22"	20"
Rows	Rows	Rows	Rows	Rows
<u>10.5</u>	<u>11.2</u>	<u>13.1</u>	<u>14.3</u>	<u>15.8</u>

T-band Quadris



In-Furrow Recommendations

- T-band only, between seed drop and row closing
- Often see a 5% stand reduction
- Do not mix with fertilizer
- Do not dribble in-furrow



In-Furrow Recommendations

- Not less than 20 psi
- 5–10 gallons/acre
- Tip not less than “015” for volume
- 50 mesh screen
- Tip angle depends on height
 - 25° to 80°



In-Furrow Summary

- Narrow T-band
 - 3.5 inches
- Lower proportionate rate
 - Down to $\frac{1}{2}$ rate



In-Furrow, T-band, Rates of Quadris, fl oz/acre

	Row Spacing				
Band Width	30 Inch	28 inch	24 inch	22 inch	20 inch
7 inch	10.5	11.2	13.1	14.3	15.8
6 inch	9.0	9.6	11.3	12.3	13.5
5 inch	7.5	8.0	9.4	10.2	11.3
4 inch	6.0	6.4	7.5	8.1	9.0
3 1/2 inch or less	5.3	5.6	6.6	7.2	7.9



Questions?