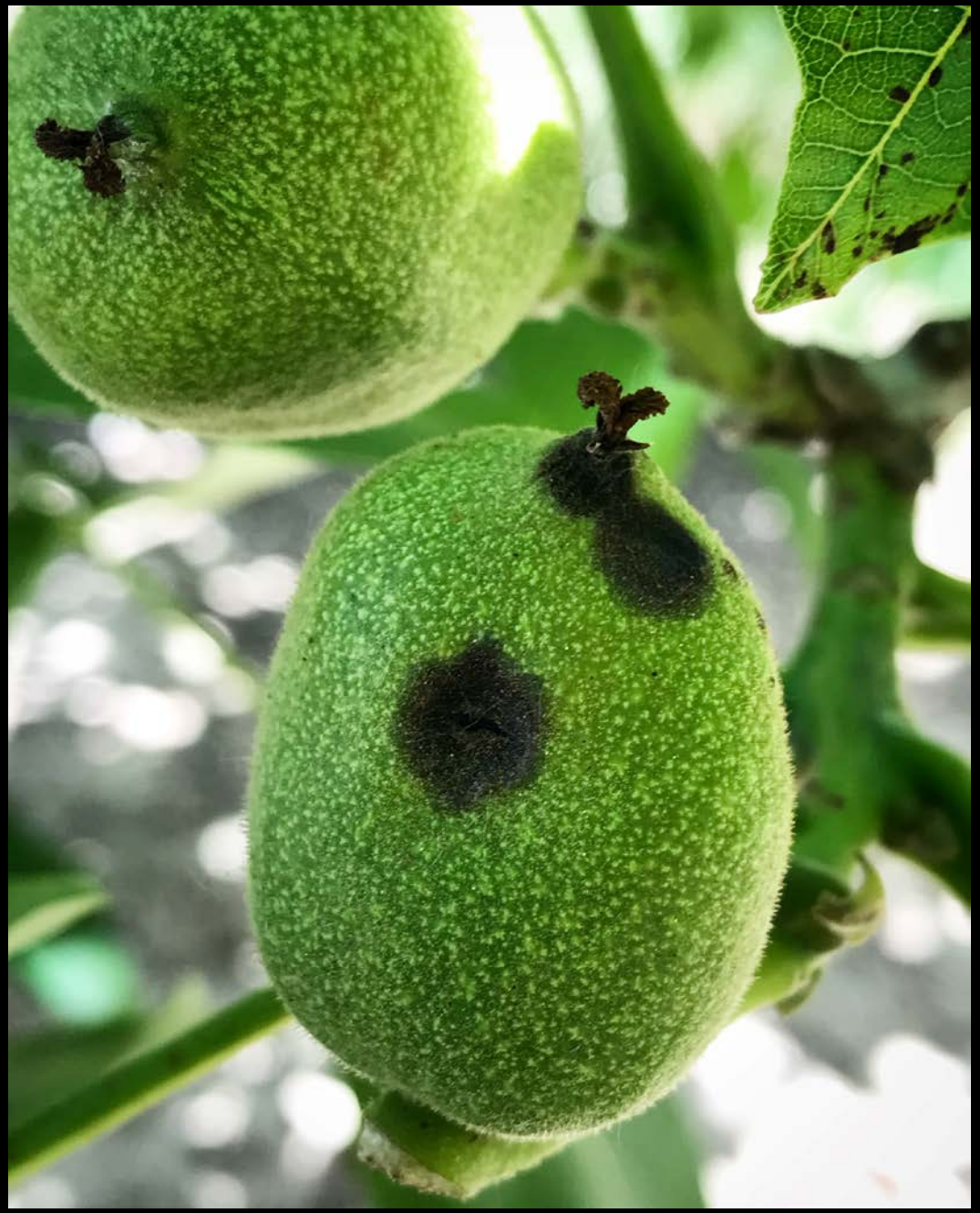

Walnut Blight

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UC Walnut Short Course

For the latest from UCCE orchard farm advisors…

- **Newsletters:** Sacramento Valley: Walnuts, Almonds, and Prunes

- **Podcast:** Growing the Valley

UC CE | University of California Agriculture and Natural Resources | Cooperative Extension

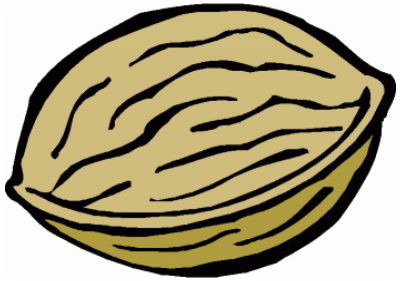
GrowingTheValleyPodcast.com

Subscribe: **Apple iTunes** and **Google Play Music**

- **Website:** SacValleyOrchards.com

What is walnut blight?

- *Xanthomonas arboricola* pv. *juglandis* (Xaj)
- Bacterial disease
- All green tissues susceptible: buds, leaves, shoots, flowers and **nuts**




Inoculum

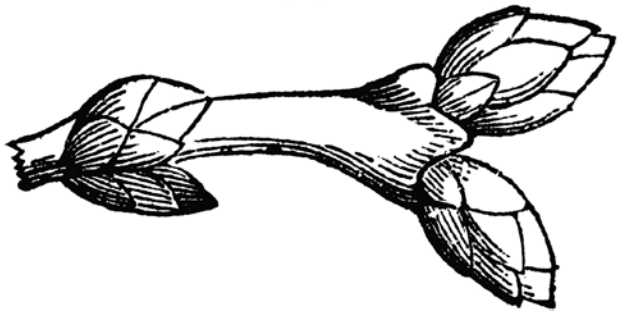
“**end blight**”	Vs.	“**side blight**”
Sunken lesions at flower end		Lesions deepen, spread, crack

Often have BOTH

Early Infection/End Blight March and April Vs. **Late Infection/Side Blight** May and June

Typically…

- Primary infection
- Infects kernel and result in June/July nut drop



- Secondary infection
- Does not drop: Possible navel orangeworm and coddling moth entry

Evidence of early infection?

Not all walnut varieties equally susceptible…

- Ivanhoe, Ahsley, Vina, Serr, Tulare among most susceptible (early leafing varieties)

- Hopeful future in UC Davis breeding efforts…

Material
Rate
Timing
Coverage

Material: A Cu & mancozeb

- Copper resistance since the 1980's…
  - Level of resistance is variable
- A copper and EBDC (Ethylene Bis-dithiocarbamate e.g. mancozeb) world…
  - Mancozeb sensitivity?
- Why copper and mancozeb?

2018: Introduction of kasugamycin

- Classified as antibiotic
- NOT a silver bullet!
- copper-mancozeb-kasugamycin
  resistance management (3 modes of action)

i.e. (1)Cu-mancozeb (2)Kasumin-mancozeb (3)Kasumin-Cu

The fundamentals remain…

Rate
Timing
Coverage

now with the opportunity for… **Rotation**

Rate: Under High Pressure

- Paying attention to metallic copper equivalent (MCE)

  Rate **x** % MCE e.g. 6 lbs x 0.3 = 1.8 MCE

fungicide/bactericide

Dry Flowable

Active Ingredients	***By Weight***
Copper Hydroxide* (CAS No. 20427-59-2)	46.1%
Inert Ingredients	53.9%
TOTAL	100.0%

(* Metallic Copper Equivalent 30%)

Rate: Under High Pressure

- CA Walnut Board: EPA considering reduction in annual copper use for walnuts from 32 lbs/ac to **24 lbs/ac**

- Added value of kasugamycin?

Timing: Disease Pressure

- What is the disease pressure?
  - Orchard History
  - No history? = Bud testing

    (i.e. measuring the inoculum)
    - 50-100 dormant buds collected / block

Timing: First Spray

- High Pressure
  - Catkin emergence
  - “Bud-break”
- Moderate/Low Pressure
  - 20% Female flowers visible (aka “prayer stage”)
- Very low pressure
  - 40% “prayer stage”

Timing: Second Spray…. Under high pressure

All new growth is unprotected…

Timing: Fruitfulness

Early sprays have the most impact on disease control

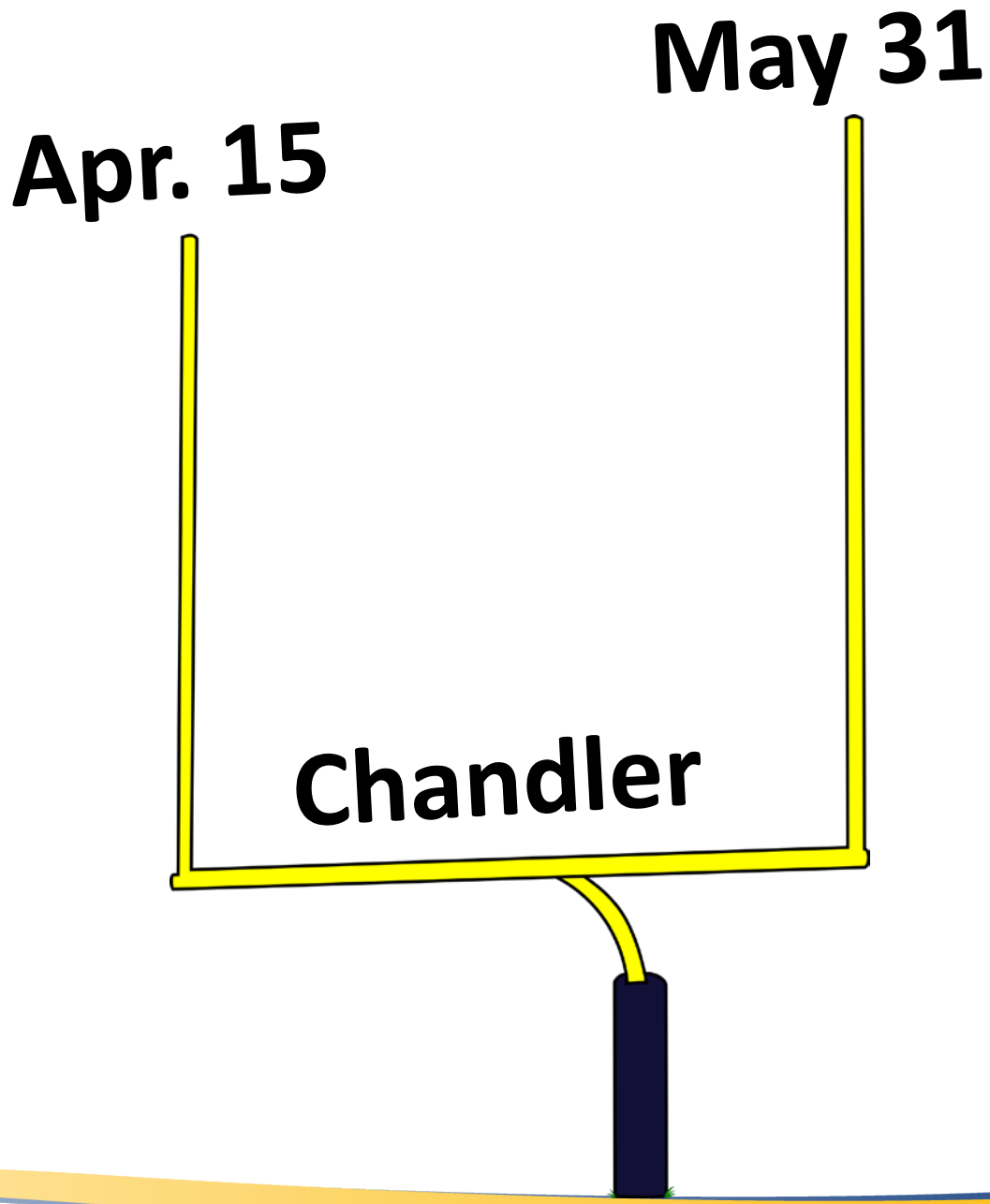
Incidence of walnut blight on trees treated at various frequencies with Kocide + Manex

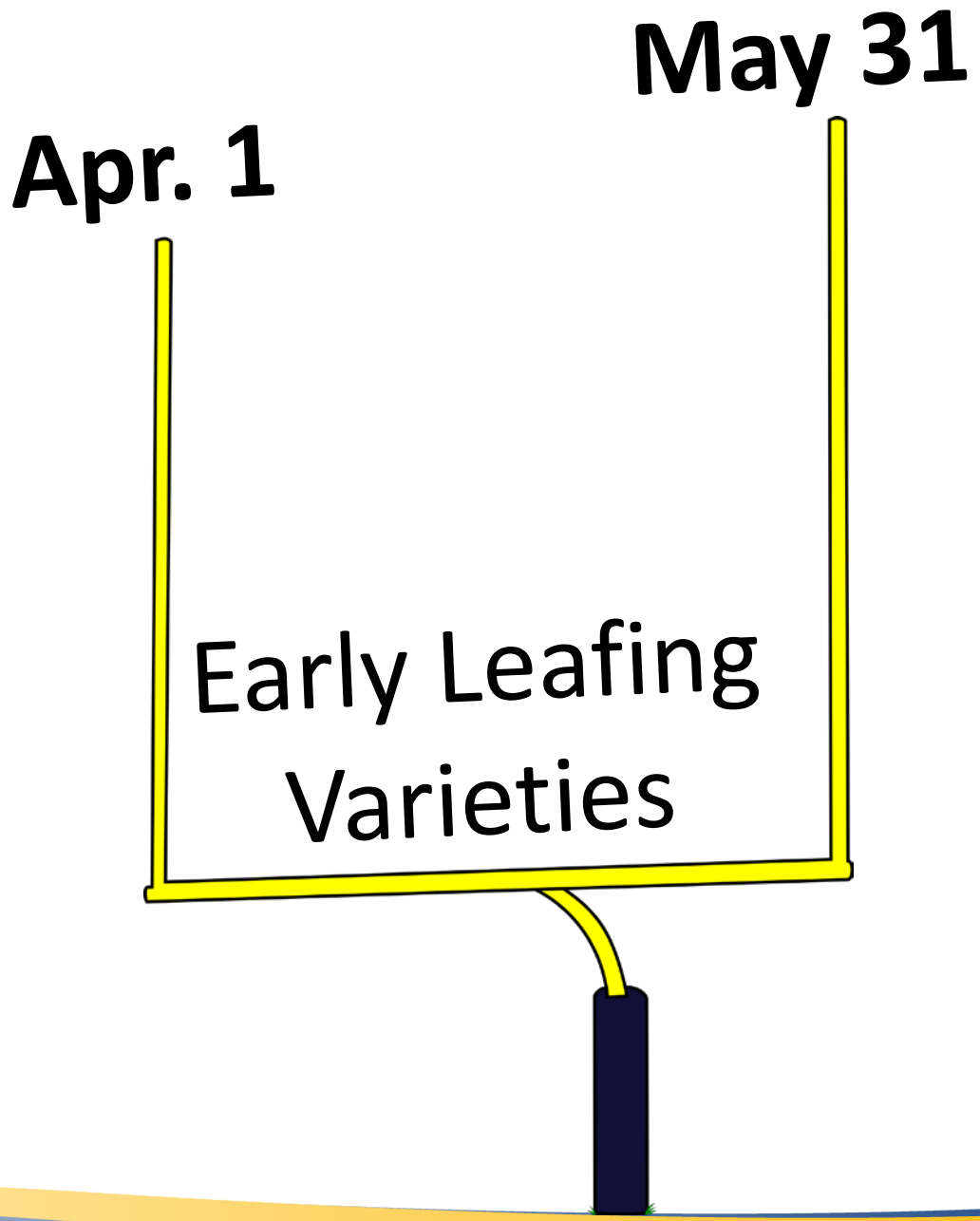
Week							Disease
0	1	2	3	4	5	6	(%)
none							57.4 a
+							25.4 b
+	+						4.4 c
+	+	+					4.7 c
+	+	+	+				1.1 c
+	+	+	+	+			1.0 c
+	+	+	+	+	+		1.2 c
+	+	+	+	+	+	+	0.9 c
none	+	+	+	+	+	+	1.1 c

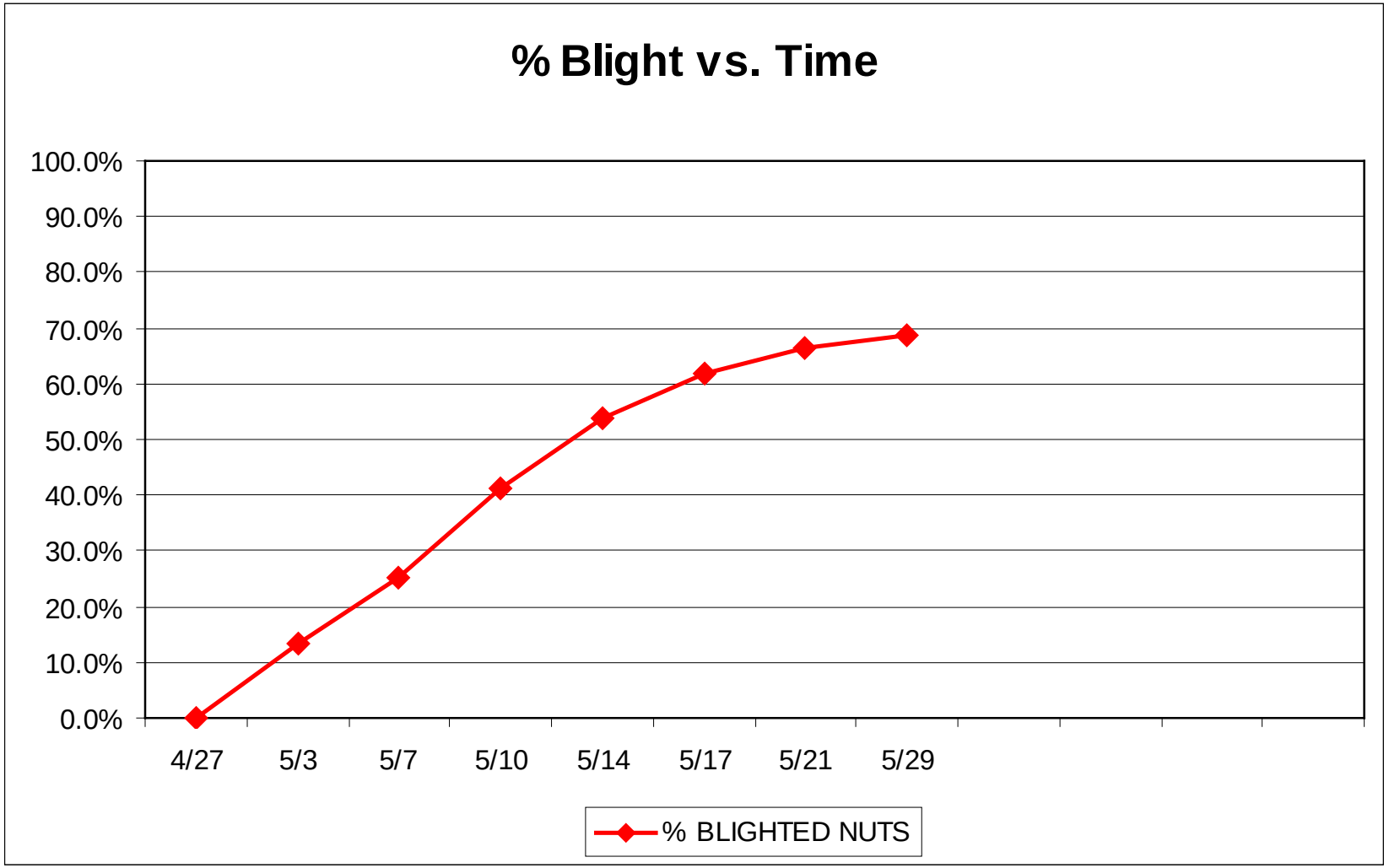
Timing:

Goal posts for management

-New unprotected foliage all the time

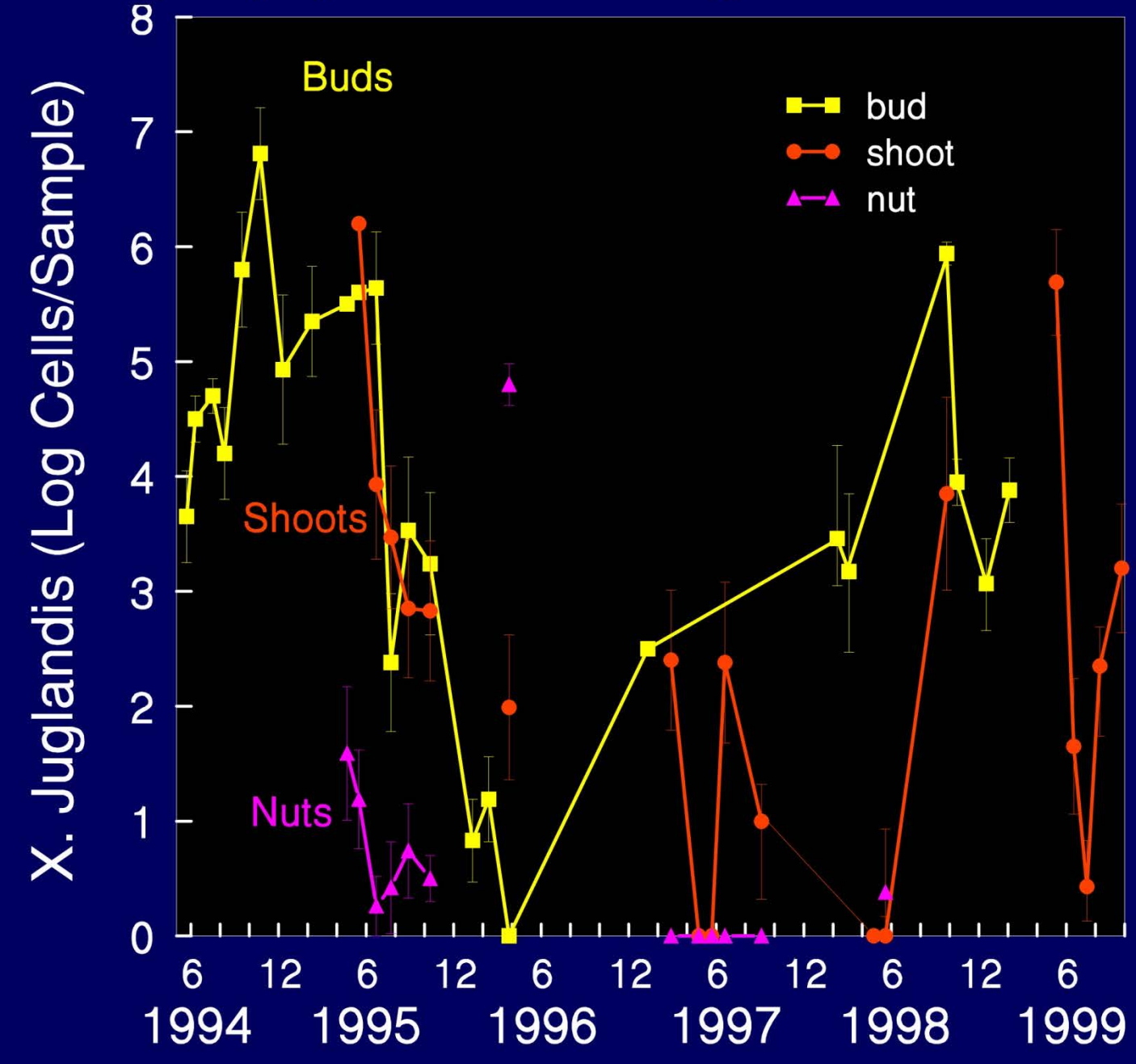



May 31
Apr. 1
Early Leafing
Varieties



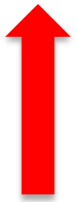
Blight Symptoms on Untreated Chandler Walnuts Under Simulated Rainfall. Tehama experiment 2007.

Pathogen populations change over time



Coverage

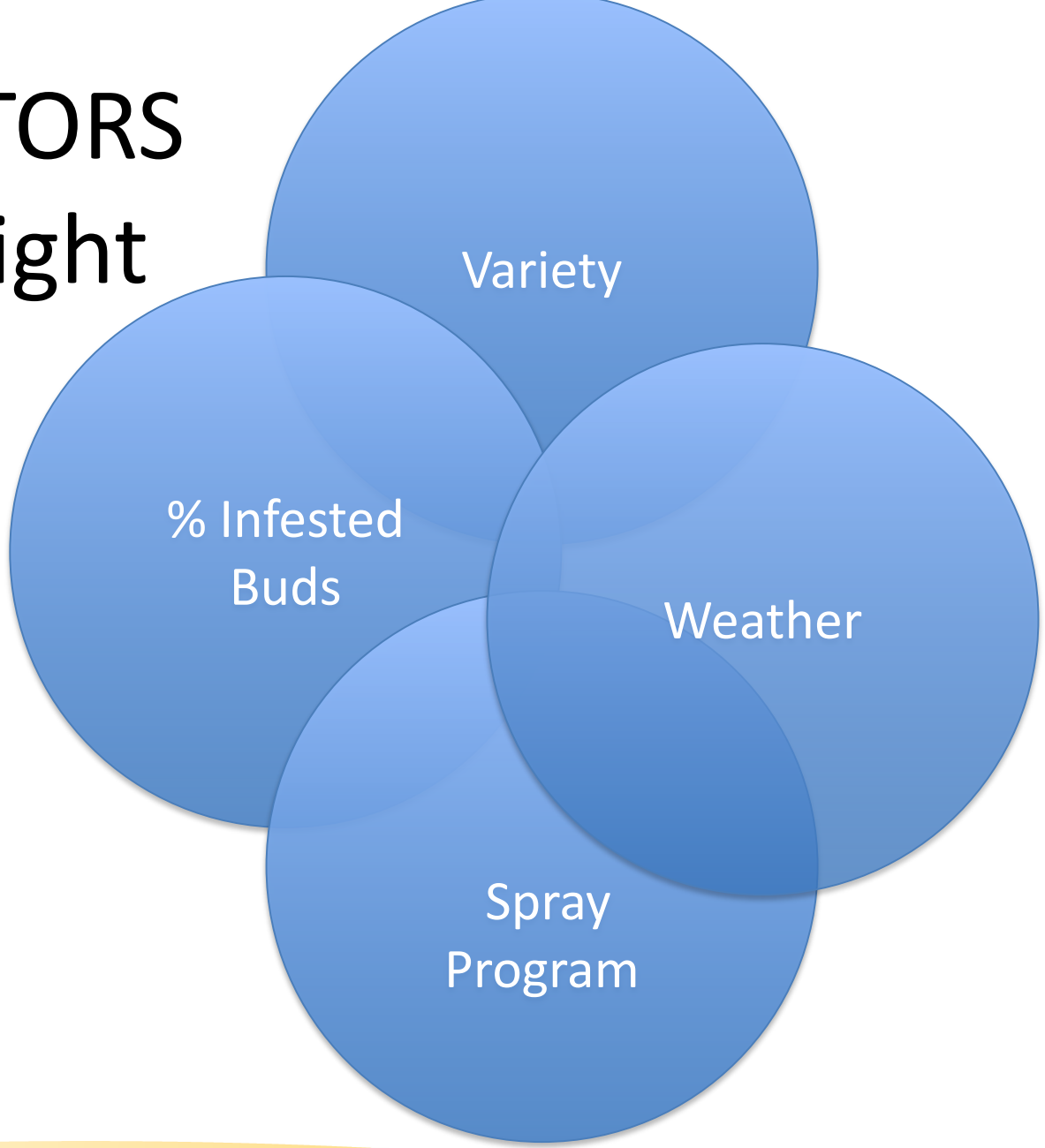
- If you don't cover it, you don't protect it!
  - Calibrate, use spray cards
- Employing large sprayers….



…foliage!
- **Avoiding ½ sprays**
  - particularly on first two sprays

    (NOT allowed anyway for Kasumin 2L)

The FACTORS for % Blight



What can go wrong

1) First spray timing too late.
2) Walnut blight bacterial populations very high in dormant buds resulting in high initial disease pressure.
3) Material rates too low.
4) Poor spray coverage.
5) Using a weak material in high blight potential orchards.
6) Not tank mixing with an EBDC formulation.
7) Every other row sprays….

The Future of Blight Management

- Future chemistries???
  - Antibiotics
  - Spray partners
- Natural products & biopesticides

- UCD Breeding Program
  - Screening for resistance

Blight Control Summary

1) First application at appropriate stage for inoculum level. Second 7-10 days later.

2) Watch weather and treat accordingly.

3) Full label rates of copper.

4) Full coverage spray

5) Apply copper, mancozeb and kasugamycin in two part combinations and rotate!

6) Use judgment based upon location and disease severity.