Walnut Blight Control Investigations Tehama County 2008

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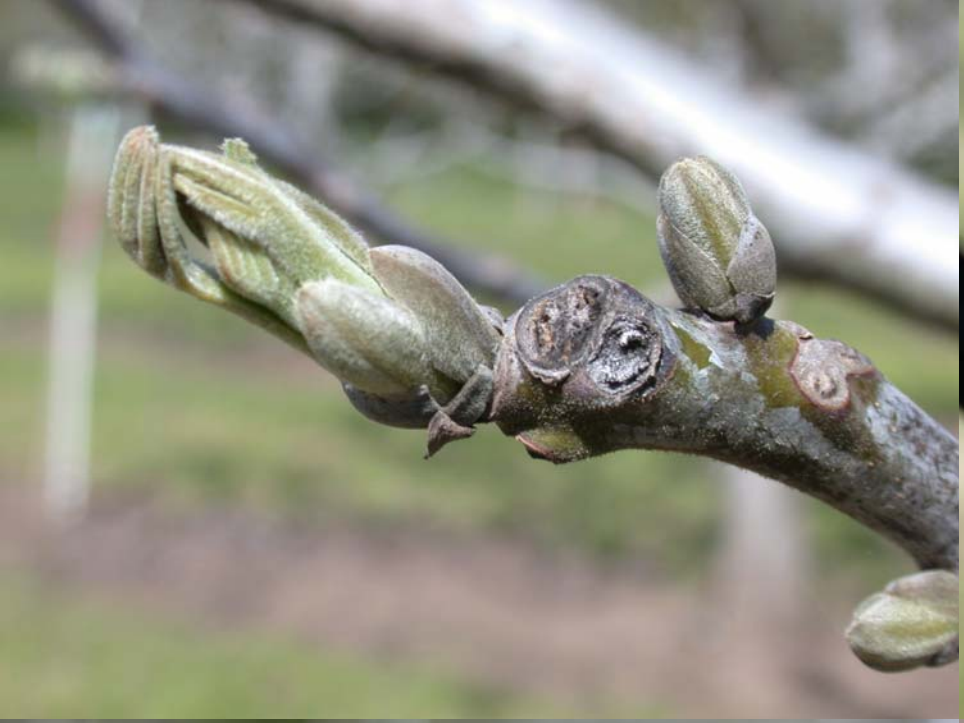
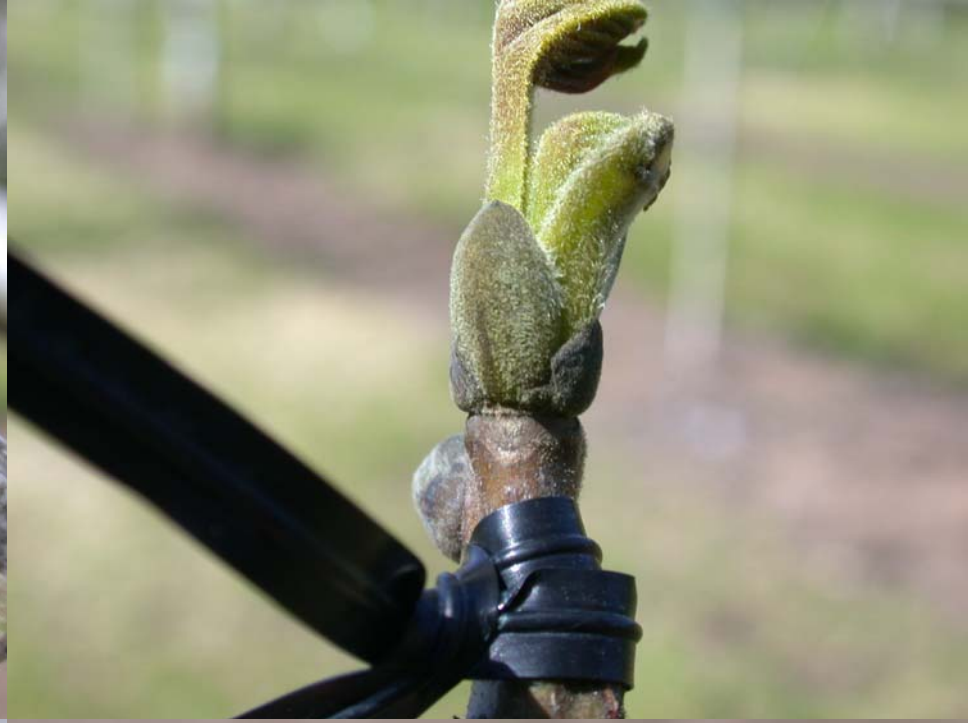
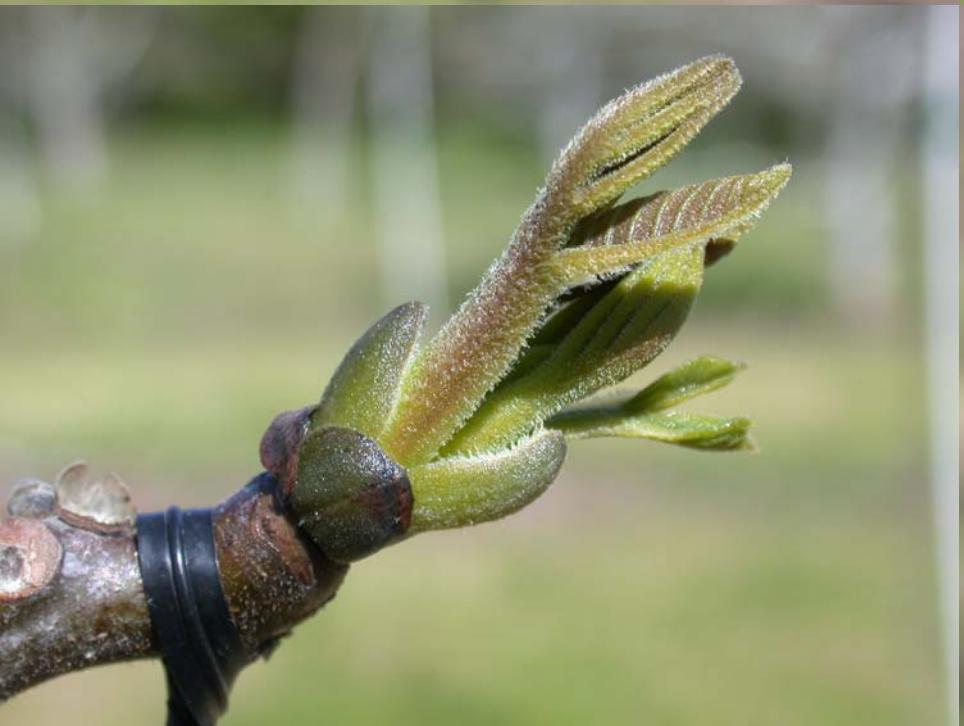
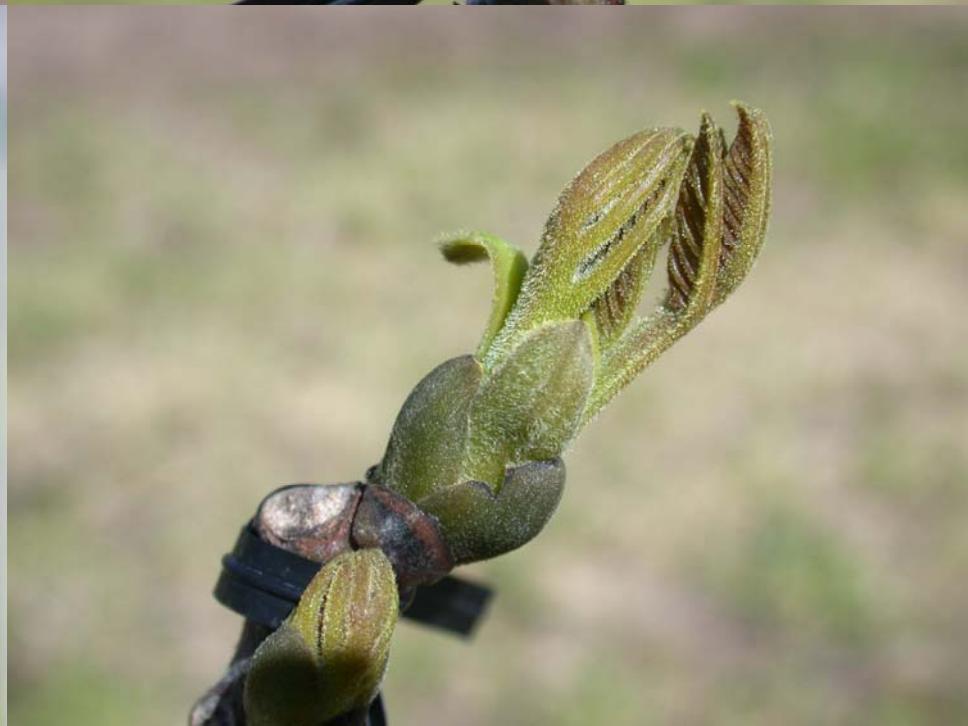





Rainfall, Stage of Growth and Spray Timing for the Tehama Walnut Blight Experiment

Date	Rainfall	Water Spray	Event
3/27	—	—	20% bud break
3/29	.01	—	19% bud break
3/31	—	—	30% bud break (first pollen)
4/1	—	—	first blight spray
4/2	—	—	30% prayer
4/3	—	—	32% bud break
4/6	—	—	first flowers
4/8	—	handgun water[1]	—
4/10	—	—	45% bud break (second spray)
4/14	—	handgun water	—
4/15	—	speed sprayer water	—
4/16	—	—	51% bud break
4/20	—	—	full bloom (frost)
4/21	—	—	third spray
4/22	.09	—	—
4/23	.03	handgun water	—
4/24	—	—	48% bud break (1/8 nut size)
4/28	—	handgun water	—
5/2	—	—	fourth spray
5/5	—	—	48% bud break (3/8 nut size)
5/23	.03	—	—
5/24	.08	—	—

[1]Water application by handgun or speed sprayer

Comparisons of Kocide with and without Manex and Manex vs. Manzate 75DF

Treatment	% Blight
Kocide 2000 @ 6 lbs. + 58 oz. Manex/Ac	3.98 a[1]
Kocide 3000 @ 4 lbs. + 58 oz. Manex/Ac	7.80 ab
Kocide 3000 @ 4 lbs. + 2.4 lbs. Manzate[2]/Ac	4.01 a
Kocide 2000 @ 6 lbs.	9.22 b
Untreated (simulated rainfall)	32.05 c
Untreated (natural rainfall)	4.04[3]

[1]Duncan's multiple range test for treatment means at the 5% level
[2]Manzate 75DF: Dupont Crop Protection, Zinc ion and Manganese ethylene-bisdithocarbamate
[3]Non replicated trees outside of the rainfall simulator

Spray application dates were: 3/30/07; 4/9/07; 4/18/07; 4/30/07 and 5/10/07.

Treatments and rates.

Treatment	Rate
1. Kocide 3000 + Manex	4 lbs. + 58 oz./Ac.
2. Kocide 3000 + Dithane	4 lbs. + 58 oz./Ac.
3. Kocide 3000 + Manzate	4 lbs. + 2.4 lbs./Ac.
4. Kocide 3000 + Manzate	4 lbs. + 1.5 lbs./Ac.
5. Kocide 3000 + Manzate	4 lbs. + 0.5 lbs./Ac.
6. Kocide 3000	4 lbs./Ac.
7. Pristine	10 oz./Ac.
8. Pristine + Kocide 3000	10 oz. + 4 lbs./Ac.
9. NuCop + Manex	4 lbs. + 58 oz./Ac.
10. Kocide 2000 + Manex + Cyd-X	6 lbs. + 58 oz. + 1.5 oz./Ac.
11. Kocide 2000 + Manex + Cyd-X	6 lbs. + 58 oz. + 3.0 oz./Ac.
12. Untreated Control	—

RESULTS AND DISCUSSION

Treatment	%Blight	Phytotoxicity
1. Kocide 3000 + Manex	0 a[1]	0
2. Kocide 3000 + Dithane	.28 a	0
3. Kocide 3000 + Manzate (2.4 lbs.)	.09 a	0
4. Kocide 3000 + Manzate (1.5 lbs.)	.54 a	0
5. Kocide 3000 + Manzate (0.5 lbs.)	.23 a	0
6. Kocide 3000	.22 a	0
7. Pristine	.16 a	0
8. Pristine + Kocide 3000	.43 a	0
9. NuCop + Manex	.37 a	0
10. Kocide 2000 + Manex + Cyd-X	.11 a	0
11. Kocide 2000 + Manex + Cyd-X	.12 a	0
12. Untreated Control	.32 a	0

[1]Duncan's multiple range test for treatment means at the 5% level.

Effect on blight control from a single spray applied 4/2/08 (30% prayer) using five rates of Breakthru. Single tree treatment, non replicated.

Treatment	% Blight
Kocide + Manex[1]	1.35
Kocide + Manex + 8 oz/100 gal Breakthru	1.37
Kocide + Manex + 16 oz/100 gal Breakthru	.15
Kocide + Manex + 32 oz/100 gal Breakthru	.56
Kocide + Manex + 64 oz/100 gal Breakthru	.68

[1]Kocide 3000 @ 4 lbs + Manex @ 58 oz/ac.

Kernel copper analysis for treated trees with and without copper and Manex.

Treatment	Kernel ppm Cu
Kocide 3000 @ 4 lbs. + 58 oz. Manex/ac	13.12 a[1]
Kocide 3000 @ 4 lbs./ac	15.14 a
Untreated control	13.88 a

Spray application dates were 4/01/08, 4/10/08, 4/21/08 and 5/2/08.

Kocide 101 @ 8 lbs. + 58 oz. Manex/Ac.	13.62 a[1]
Kocide 2000 @ 6 lbs. + 58 oz. Manex/Ac.	11.76 a
Kocide 3000 @ 4 lbs. + 58 oz. Manex/Ac.	13.12 a
Kocide 2000 @ 6 lbs.	11.88 a
Untreated Control	13.38 a

Spray application dates were: 3/30/07; 4/9/07; 4/18/07; 4/30/07 and 5/10/07.

[1]Duncan's multiple range test for treatment means at the 5% level. RCB design, 3 treatments with 5 replicates.

Shoot nut set for four prayer stage dates. 100 shoots tagged at each date, two replicates. Full bloom 4/20/08, nuts counted 6/12/08.

Tree #1

Date Prayer Stage	% shoots no walnuts	% shoots one walnut	% shoots two walnuts	% shoots three walnuts
4/2/08	11.3	32.7	45.9	10.2
4/7/08	9.4	43.8	44.8	2.0
4/11/08	30.0	42.2	27.8	0.0
4/15/08	83.8	10.0	6.2	0.0

Tree #2

Date Prayer Stage	% shoots no walnuts	% shoots one walnut	% shoots two walnuts	% shoots three walnuts
4/2/08	33.3	27.3	29.4	0.0
4/7/08	43.1	27.4	29.5	0.0
4/11/08	59.8	26.4	13.8	0.0
4/15/08	94.0	4.8	1.2	0.0

Tehama Codling Moth/Blight Plot 2008

Treatment	Canopy Count 8/6/08	Harvest (CM)
Kocide 2000 + Manex + 1.5 oz. Cyd-X	.44	0
Kocide 2000 + Manex + 3.0 oz. Cyd-X	.14	0
Kocide 3000 + Manex	.20	0
Kocide 3000	.20	0
Control	.29	0

Spray dates: 4/1, 4/10, 4/21 (195DD) 5/2 (324DD) and 6/27. Biofix 3/24, 6/23 and 8/7.
Five single tree replicates and 400 nuts per tree.

In Summary:

- Need rainfall for conditions that encourage walnut blight infection.
- Manzate @ 2.4 lbs. is effective.
- Still working on Manzate rates.
- Breakthru at 8-16 oz./100 gal.
- Blight sprays do not increase kernel copper content.
- First prayer stage are more likely to set walnuts.
- Cyd-X combined with a blight control program needs additional investigation.

How to Kill Blight in Tehama County

1) First application at 40% prayer stage
   Second 7-10 days later (8-16 oz. Breakthru or equivalent).
2) Watch weather and treat accordingly
   6.0 lbs. Kocide 2000 – 35% metallic
   4.0 lbs. Kocide 3000 – 30% metallic
   58 oz. Manex / 2.4 lbs. Manzate
3) Any good quality copper will work.
4) Full coverage for the first and second.
   Watch weather and treat accordingly.
5) Use judgment based upon location and disease severity.

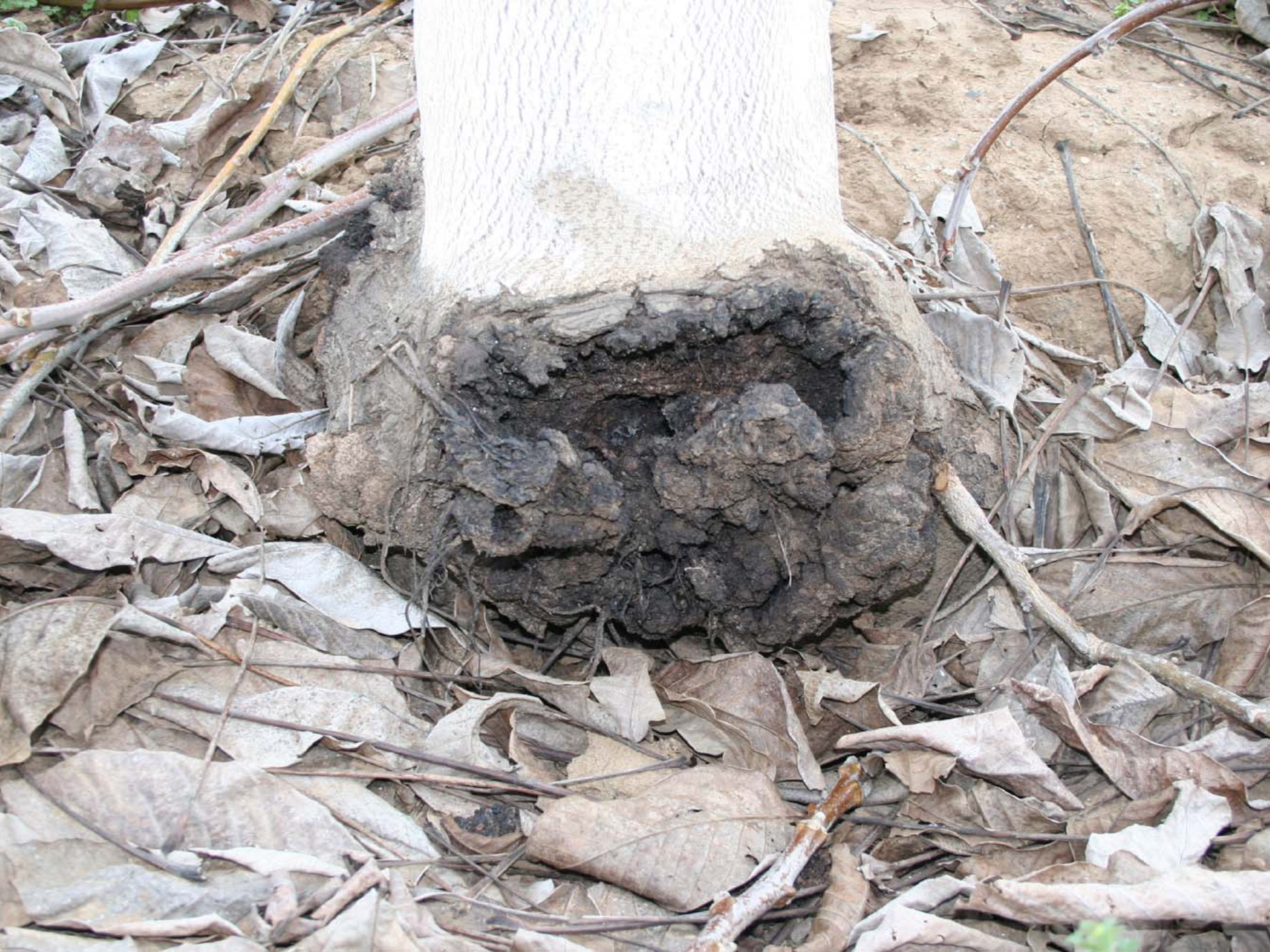
CROWN GALL TREATMENTS

Richard Buchner, Jim McKenna, Alex Suchan and Cyndi Gilles

Treatment	Surgery Ring/Removal	Live Galls[1] 12/29/99	Live Galls 7/14/00
1. Breakthru® 1%	Yes	0	2
2. Bleach 10%	Yes	1	6
3. Breakthru® 1% + Bleach 10%	Yes	0	1
4. Breakthru® 1% + Bleach 10%	No	7	8
5. Gallex®	Yes	0	0
6. Gallex®	No	8	8
7. Blowtorch	Burned	0	0
8. UN32	Yes	0	0
9. #2 Diesel	Yes	0	1
10. None/Control	Yes	0	0
11. None/Control	No	8	8

Figure 1. Technique and material evaluation for Crown Gall control. Galls were initially treated 7/14/99. Breakthru®, Gallex®, Bleach and Diesel were reapplied 7/29/99 to ensure good material coverage. Galls were rated 12/29/1999 and again 7/14/2000.

[1]Numbers represent the number of live galls compared to the 8 galls initially treated.

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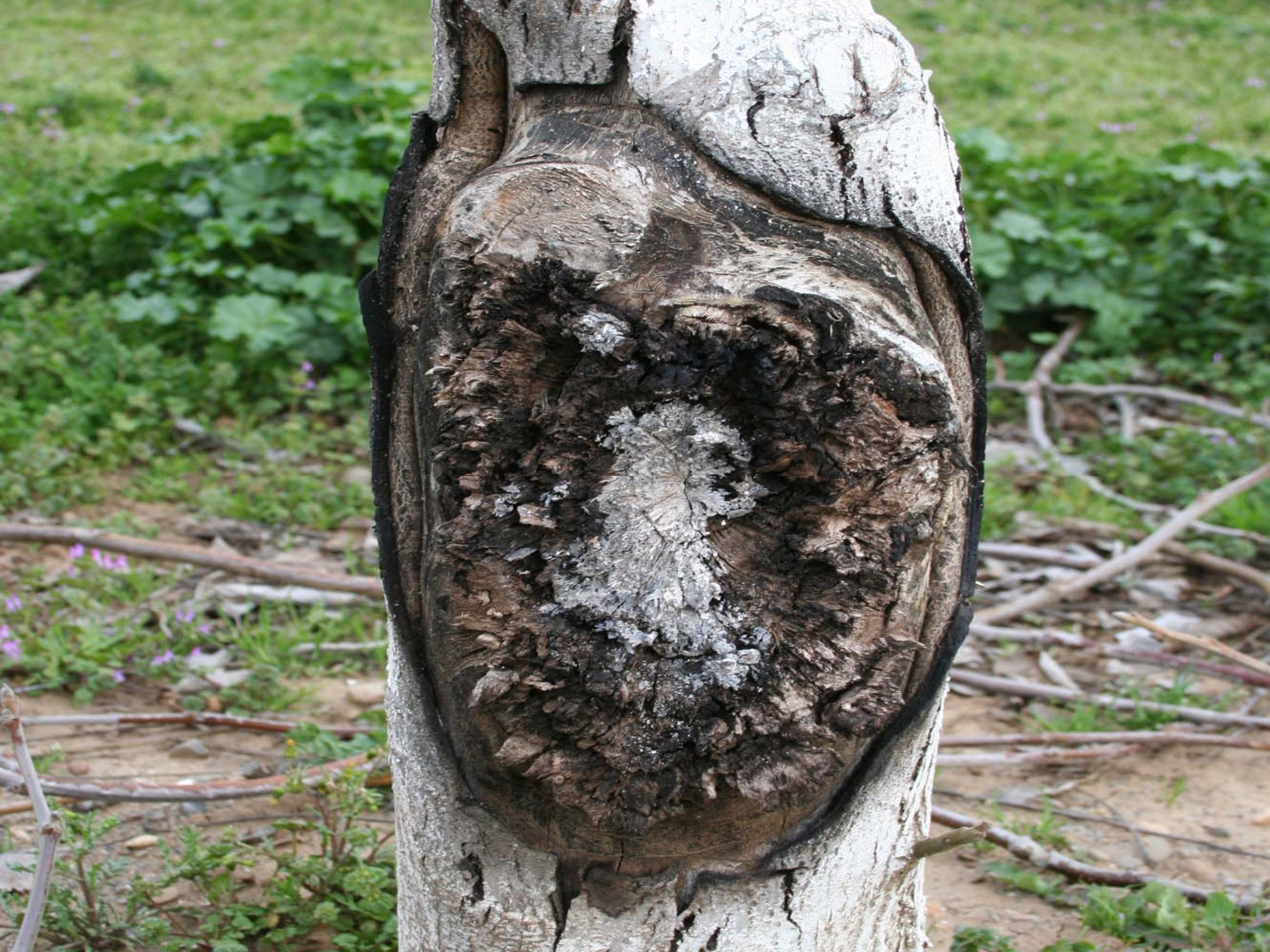

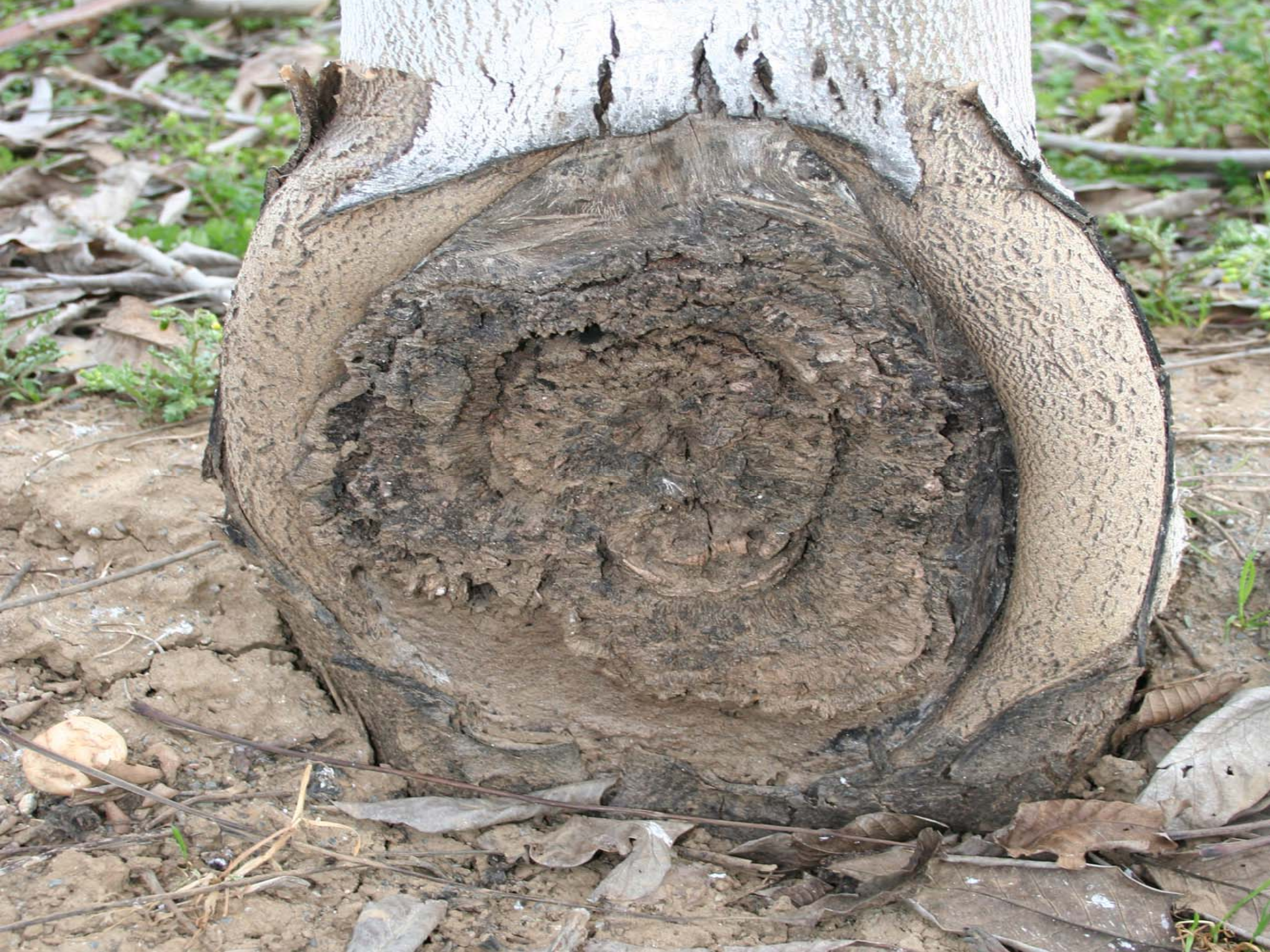

Summary

- Tissue around the gall is critical to treat
- Chemical treatments alone were not effective
- Clean surgery is effective
- Killing surrounding bark with heat is effective
- Surgery plus heat is the preferred method
- Get them when they’re small