

HERBICIDE OPTIONS FOR WEED CONTROL

2011 Annual Pistachio Day
Visalia, CA
January 12, 2011



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<http://cefresno.ucdavis.edu>



- Preemergents
- Postemergents
- Performance
 - timing, mixes, coverage

Helpful resources for herbicides used in pistachios, rates and timings, and weeds controlled:

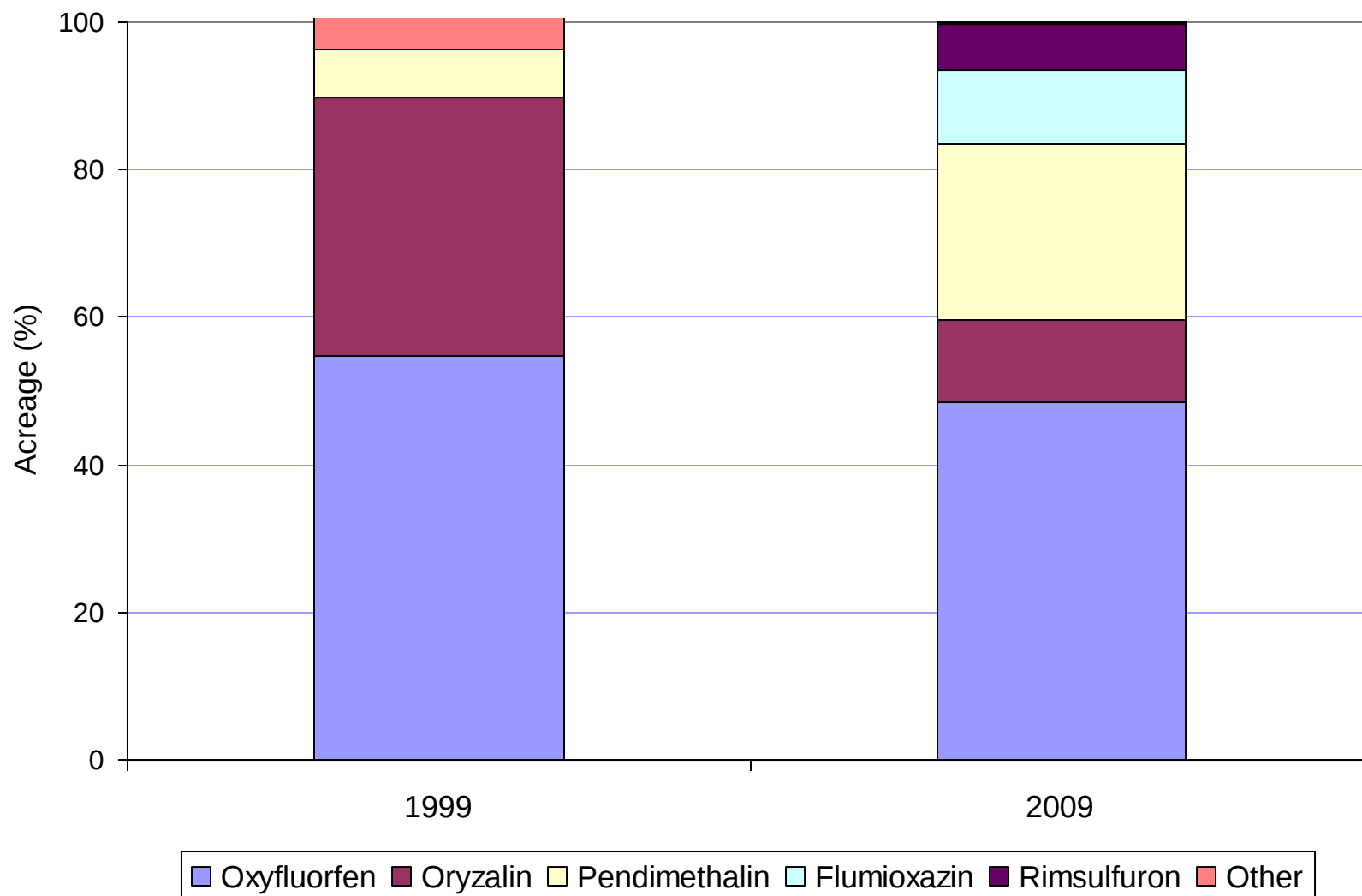
Pistachio Production Manual

<http://ucipm.ucdavis.edu>

<http://cefresno.ucdavis.edu>

<http://www.cdms.net>

Preemergent herbicide use in pistachios in California



PRE herbicides and weeds:

	B/NB	NB	B/NB	12 mo	9 mo	B/NB	B/NB	NB	NB
	Chateau	Gallery	Goal	Matrix	Pindar GT	Prowl	Surflan	Treflan	Visor
Cheeseweed									
Common purslane									
Filaree									
Hairy fleabane									
Henbit									
Horseweed									
Knotweed									
Mullein									
Nettle									
Panicle willowherb									
Prickly lettuce									
Puncturevine									
Russian thistle									
Annual grasses									

Pindar GT (Dow AgroSciences): New CA Label 2010

AI: Penoxulam (0.083 lb/gal) - *ALS*
Oxyfluorfen (3.93 lb/gal) - *PPO*

Tree nuts	Tree age	Rate/A app.	Rate/A/ season	Dormant timing	PHI
Almond	15 mo	1.5-3 pt	4.5 pt	Post-harvest to pink bud	60 day
Pecan	9 mo	1.5-3 pt	4.5 pt	Post-harvest to green leaf	60 day
Pistachio	9 mo	1.5-3 pt	4.5 pt	Post-harvest to green leaf	60 day
Walnut	9 mo	1.5-3 pt	4.5 pt	Post-harvest to green leaf	60 day

***You can only use up to 3 lbai/acre of oxyfluorfen harvest-to-harvest.
Add an MSO at 1 qt/100 gal for burn-down.**

Almond weed control 2010

(45 DAT)

Treatment	Rate/Acre	Cw	As	Ma	Lr	Fb
1. Untreated	----	0.0 d	0.0 d	0.0 c	0.0 d	0.0 c
2. Rely 200 + RU + AMS	5 pt + 1.5 qt + 15 lb/100 gal	9.5 b	9.0 b	9.0 b	8.5 b	8.5 b
3. Alion + #2	5 floz	10 a	10 a	10 a	10 a	9.9 a
4. Alion + #2	6.8 floz	10 a	10 a	10 a	10 a	10 a
5. Alion + Matrix + #2	5 floz + 4 oz	10 a	10 a	10 a	10 a	10 a
6. Alion + Goaltender + #2	5 floz + 3 pt	10 a	10 a	10 a	10 a	10 a
7. Pindar GT + Prowl H ₂ O + #2	3 pt + 4 qt	10 a	10 a	10 a	10 a	10 a
8. Amore + #2	1.33 lb	10 a	10 a	10 a	10 a	10 a
9. Amore + Prowl H ₂ O + #2	1.33 lb + 4 qt	10 a	10 a	10 a	10 a	10 a
10. Treevix + #2	1 oz	9.0 c	8.8 b	9.1 b	8.0 c	8.5 b
11. Treevix + Prowl H ₂ O + #2	1 oz + 4 qt	9.1 c	7.0 c	9.0 b	7.8 c	10 a
12. Chateau + Prowl H ₂ O + #2	12 oz + 4 qt	10 a	10 a	10 a	10 a	10 a
CV(%)		1.38	1.59	1.59	1.60	1.64
LSD		0.23	0.26	0.26	0.26	0.26

Almond weed control 2010

(171 DAT)

Treatment	Rate/Acre	Pw	As	Ns	Fb
1. Untreated	----	0.0 d	0.0 c	0.0 d	0.0 f
2. Rely 200 + RU + AMS	5 pt + 1.5 qt + 15 lb/100 gal	9.4 b	10 a	9.5 ab	2.3 e
3. Alion + #2	5 floz	10 a	10 a	9.9 ab	8.1 b
4. Alion + #2	6.8 floz	10 a	10 a	9.7 ab	8.0 b
5. Alion + Matrix + #2	5 floz + 4 oz	10 a	10 a	9.9 ab	9.7 a
6. Alion + Goaltender + #2	5 floz + 3 pt	10 a	10 a	9.9 ab	8.3 b
7. Pindar GT + Prowl H ₂ O + #2	3 pt + 4 qt	10 a	10 a	10 a	8.2 b
8. Amore + #2	1.33 lb	10 a	10 a	10 a	7.0 c
9. Amore + Prowl H ₂ O + #2	1.33 lb + 4 qt	10 a	10 a	9.9 ab	6.3 c
10. Treevix + #2	1 oz	8.5 c	8.0 b	8.0 c	5.0 d
11. Treevix + Prowl H ₂ O + #2	1 oz + 4 qt	10 a	7.0 b	7.5 c	8.1 b
12. Chateau + Prowl H ₂ O + #2	12 oz + 4 qt	10 a	10 a	9.3 b	8.5 b
CV(%)		1.36	0.52	3.85	20.41
LSD		0.22	1.25	0.62	2.80

PRE herbicide activation:

Product	Time to incorp.	Min. rainfall	Cemigate
Devrinol	4 - 10 days	1/4"	Yes
Matrix FNV	< 21 days	1/2"	Yes
Gallery T&V	< 21 days	1/2"	No
Pindar GT	< 21 days	1/4"	No
Surflan	< 21 days	1/2"	Yes
Visor	< 21 days	1/2"	No
Prowl H ₂ O	< 21 days	1/2"	Yes
Prowl 3.3 EC	< 7 days (mech.)	--	Yes
Chateau	< 28 days	1/4"	No
Goal	< 28 days	1/4"	Yes

*Cool/moist conditions favor product stability.

PRE herbicides and soil contact:

Herbicide	GPA	Affected by soil trash	Affected by disturbance
Devrinol	20	Yes	NO
Matrix FNV	20	?	?
Gallery T&V	20	Yes	No
Surflan	20	Yes	No
Visor	20	No	No
Prowl H ₂ O	20	Yes	No
Prowl 3.3 EC	20	No	No
Chateau	30	Yes	Yes
Goal	30	Yes	Yes
Pindar GT	20	Yes	Yes

A preemergent program for extended control of a large number of annual broadleaf weeds:

Oct-Jan: Matrix FNV (4 oz) + Prowl H₂O (5 pt) or Surflan AS (2 qt)
then

Jan-Mar: Chateau (12 oz) + Prowl H₂O (5 pt) or Surflan AS (4 qt)

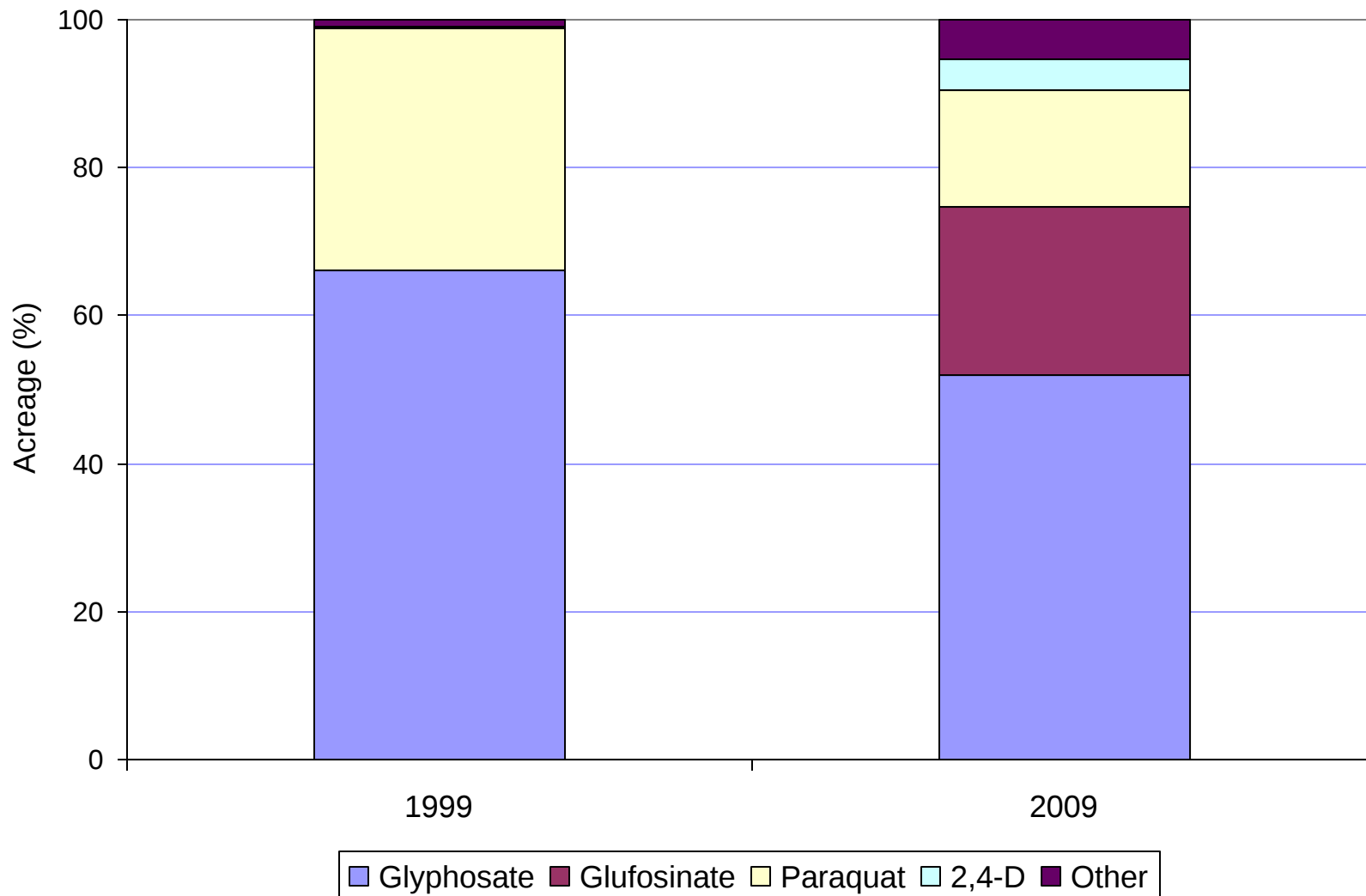
If you want to save your preemergents for late winter, then...

Oct-Jan: Postemergents (2,4-D amine, RU, Rely, etc.) need to go on young weeds (2-3 weeks after emergence)

then

Jan-Mar: Chateau (12 oz) + Prowl H₂O (5 pt) or Surflan AS (4-6 qt) or other combinations.

Postemergent herbicide use in pistachios in California



POST herbicides and weeds:

	Goal	Gramoxone Inteon	Poast	Rely 280	Roundup	Shark	Treevix	Venue	2,4-D
Cheeseweed									
Common purslane									
Filaree									
Hairy fleabane									
Henbit									
Horseweed									
Knotweed							?		
Mullein							?		
Nettle									
Panicle willowherb									
Prickly lettuce									
Puncturevine									
Russian thistle									
Annual grasses									

Treevix (BASF): New CA Label 2010

AI: Saflufenacil (70% WG) - PPO

Crops	Tre age	Rate/A app.	Rate/A season	Application timing	PHI
Almond	B/NB	1 oz	3 oz	Small weeds	7 day
Pistachio	B/NB	1 oz	3 oz	Small weeds	7 day
Walnut	B/NB	1 oz	3 oz	Small weeds	7 day
Citrus	B/NB	1 oz	3 oz	Small weeds	0 day
Pome	B/NB	1 oz	3 oz	Small weeds	0 day

*Add MSO 1 gal/100 + AMS 8.5-17 lb/100 or UAN 1.25-2.5 gal/100.
If grasses are present, add a tank-mix partner.

Almond trial 2008 (55 DAT)

Untreated

Treevix 1 oz + Roundup 24 fl oz

Roundup 44 fl oz

Almond trial 2009 (28 DAT)



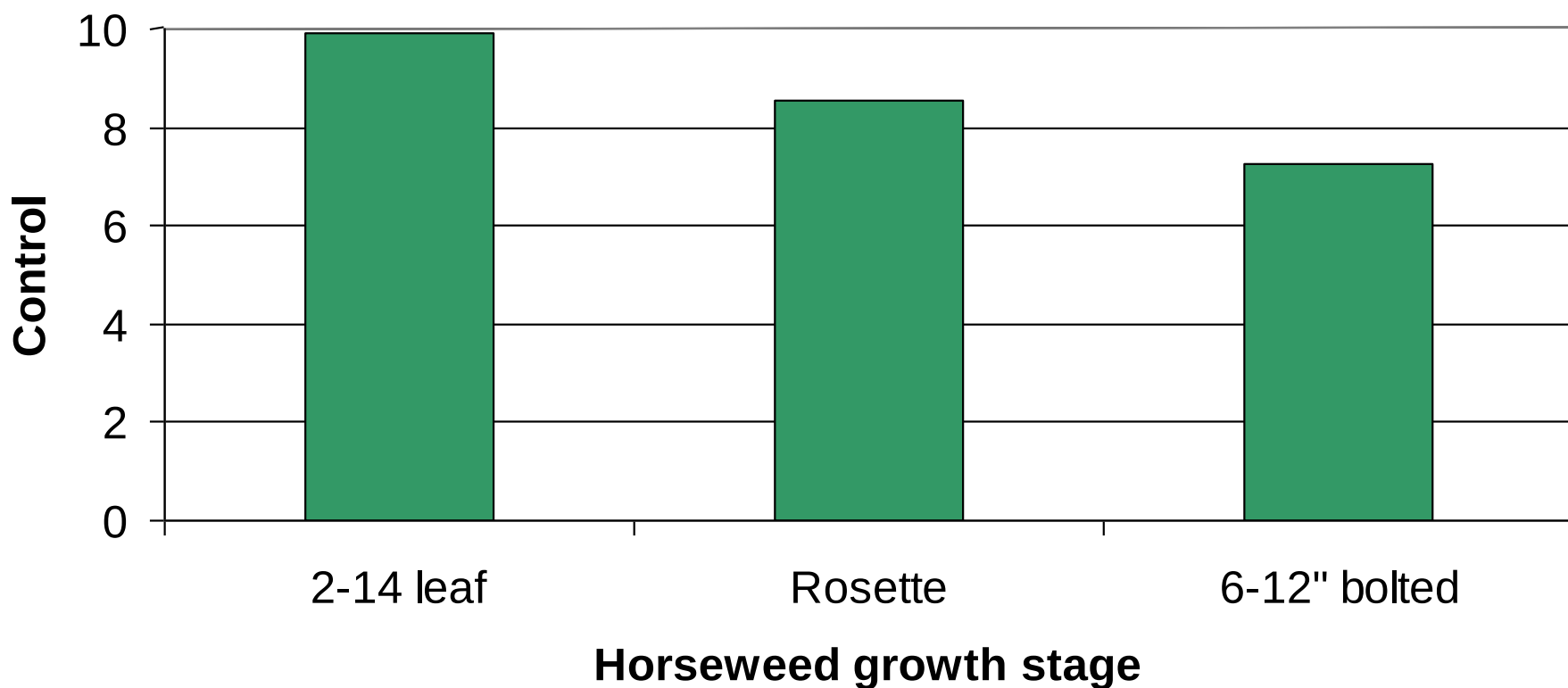
POST herbicide timing:

TREAT SMALL WEEDS, because...

more succulent → less foliage → better coverage → better control &
→ lower spray height → less spray drift → less crop injury

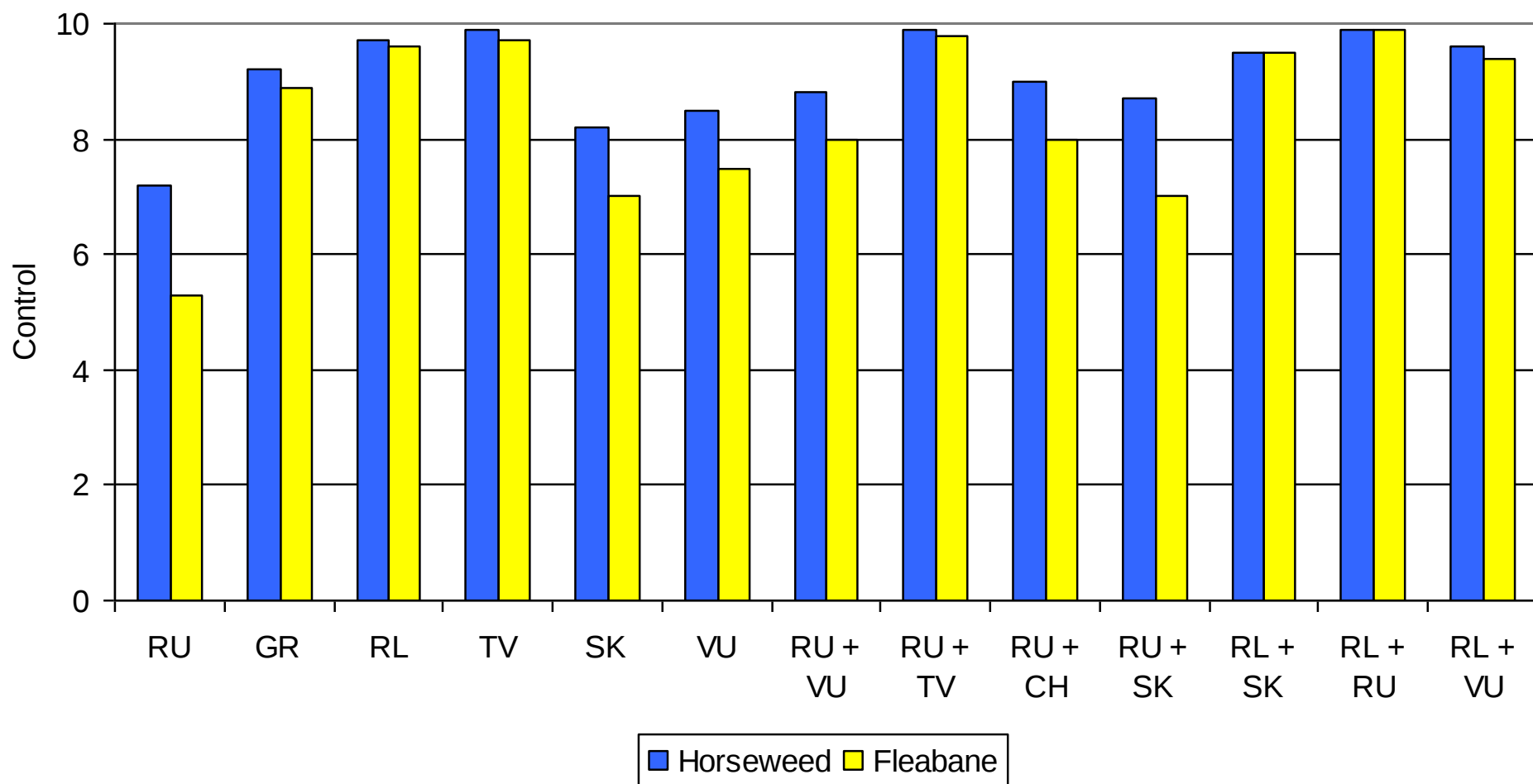
POST herbicide timing:

Horseweed control across postemergence herbicides tested
Parlier 2006

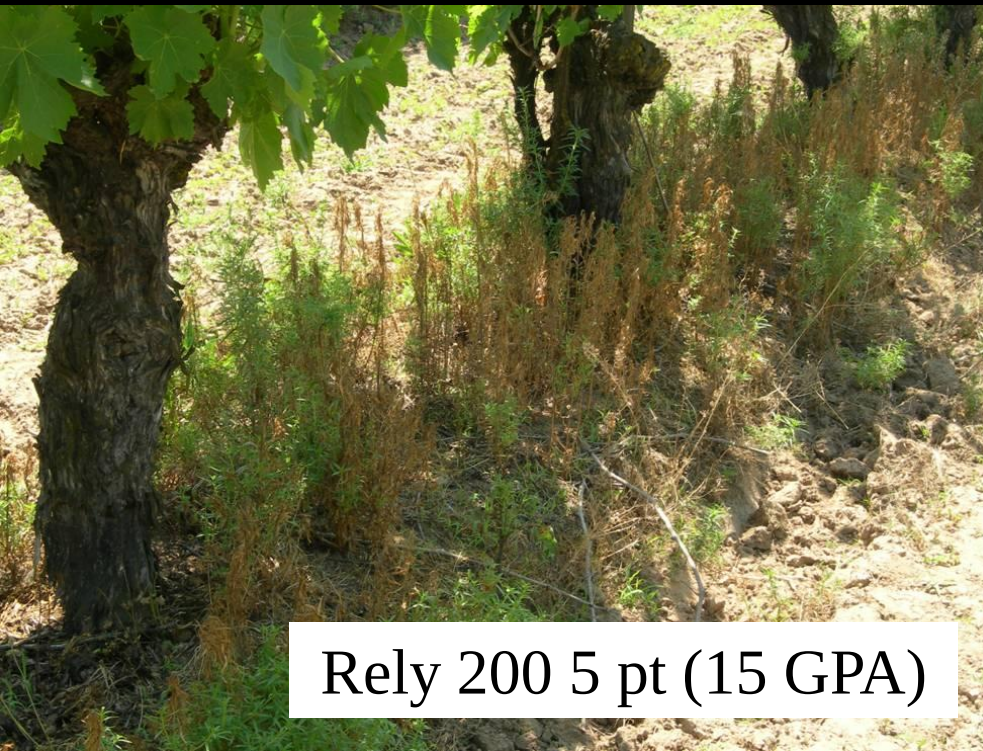


POST herbicide tank-mixing:

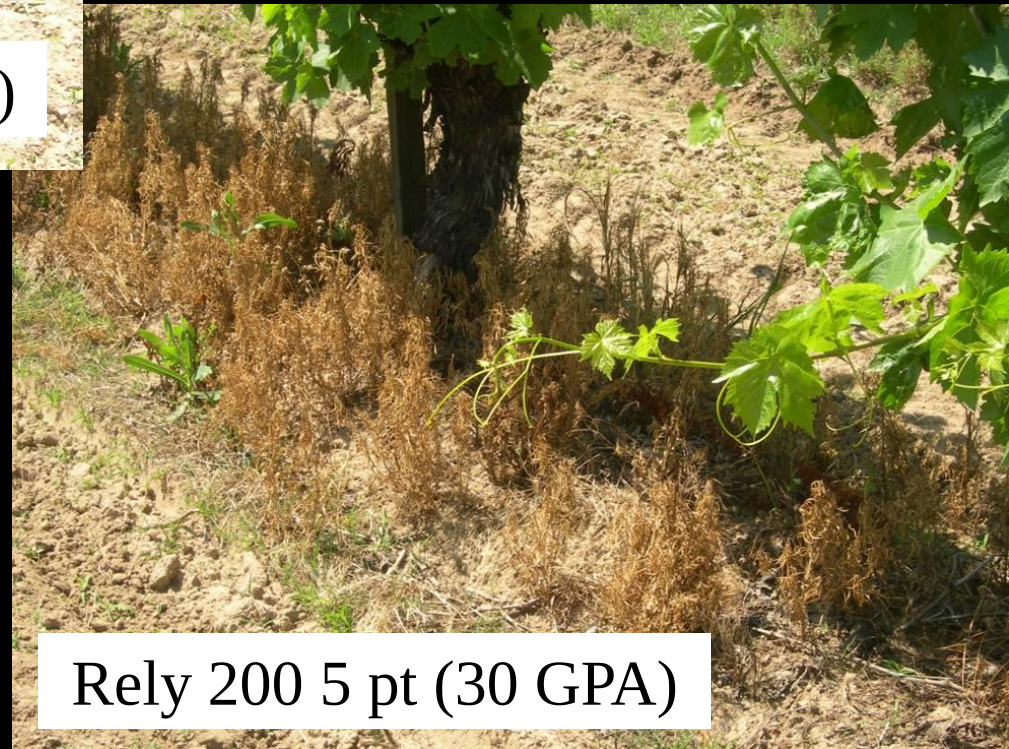
Postemergence control of horseweed and hairy fleabane across 4 trials in 2007



Willowherb in grapes (Spray volume trial 2008)



Rely 200 5 pt (15 GPA)



Rely 200 5 pt (30 GPA)

What role should spray nozzles play besides volume?

Spray nozzles directly affect:

- spray droplet size
- spray drift potential
- uniformity and coverage

Which impacts:

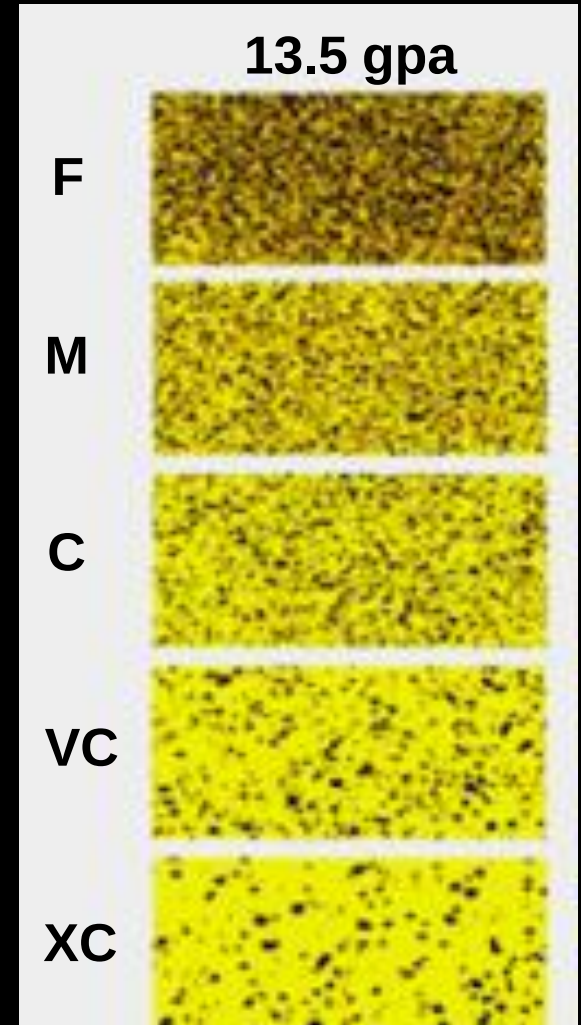
- weed control
- economics
- environmental quality



Droplet size, drift, and coverage

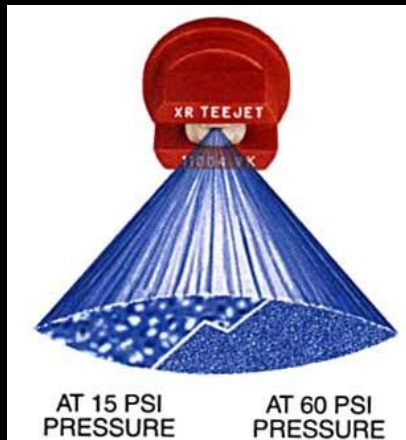
(Droplets <200 μm are the most prone to drift)

Spray droplet diameter (μm)	Spray droplet category	Example
10	---	Dry fog
<145	Very fine	Wet fog
145-225	Fine	Mist/drizzle
226-325	Medium	Very fine rain
326-400	Coarse	Fine rain
401-500	Very coarse	Light rain
>500	Extremely coarse	Medium rain
1000	---	Heavy rain

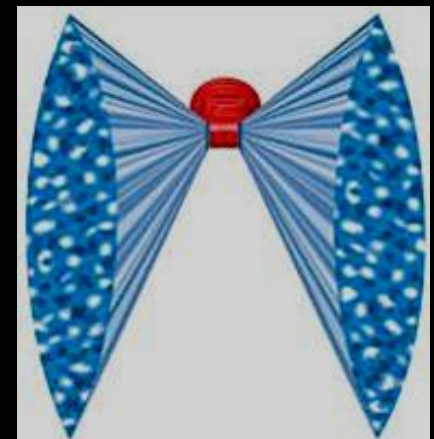


Spray nozzle designs available:

Extended Range design (XR)
<20% 200 μ m; most are F-M



Chamber design (Turbo)
<6% 200 μ m; most are M-VC



Venturi II design (Air Induction)
<3% 200 μ m; most are VC-XC



Venturi I design (Turbo Induction)
<1% 200 μ m; XC



Can we use drift-reducing nozzles that create larger droplets to help reduce the risk of spray drift and still get acceptable weed control, particularly with burn-down herbicides like Rely or Treevix?

Almond spray nozzle trial 2008

Herbicide: Rely 200 at 5 pt/acre

Pressure: 30 psi

Weeds: up to 16" tall

Volume: 26 gpa

Speed: 4 mph



28 DAT

	Hw	Hf	St	Pl	Bg
XR11004 (M)	9.7 a	9.4 b	9.9 a	9.8 a	9.3 a
TTJ60-11004 (C)	9.8 a	9.9 a	10 a	10 a	9.5 a
AI11004 (XC)	7.5 b	5.0 c	9.6 b	9.4 b	5.0 b
<i>CV (%)</i>	<i>1.46</i>	<i>1.05</i>	<i>0.50</i>	<i>1.44</i>	<i>1.37</i>
<i>LSD</i>	<i>0.37</i>	<i>0.26</i>	<i>0.12</i>	<i>0.37</i>	<i>0.81</i>

28 DAT



Spray nozzle trial WSREC 2010

Field bindweed control by <i>nozzle type, volume, and droplet size</i>				
Nozzle; volume; droplet size	9 DAT	25 DAT	44 DAT	63 DAT
1. XR11002; 13 gpa; F	9.7 b	9.6 ab	9.5 a	7.6
2. XR11004; 26 gpa; M	9.9 a	9.8 a	9.7 a	8.0
3. AI11002; 13 gpa; VC	9.4 c	8.0 c	6.2 c	6.0
4. AI11004; 26 gpa; XC	9.6 b	9.3 b	8.0 b	6.8
5. TTJ60-11002; 13 gpa; M	9.9 a	9.7 ab	9.6 a	7.5
6. TTJ60-11004; 26 gpa; C	9.9 a	9.8 a	9.7 a	7.9
CV (%)	1.21	3.31	6.67	24.83
LSD	0.18	0.46	0.89	n.s.



XR11004



TTJ60-11004

Alfalfa demonstration plot 2010 (15 DAT)



AI11004



APPLICATION AND MIXING PROCEDURES

Ground Application: Rely® 280 should be applied broadcast in a minimum of 15 gallons of water per acre. Under dense weed/crop canopies, 20 to 40 gallons of water per acre should be used so that thorough spray coverage will be obtained. Apply Rely® 280 using nozzles and pressures that generate MEDIUM (about 250 to 350 microns) spray droplets category as reported by the nozzle manufacturer and in accordance to ASABE S 572. Do not use nozzles and pressures that result in COARSE sprays. FINE sprays should also be avoided to minimize spray drift risk. Boom height should be based on nozzle manufacturer recommendations. See the *Spray Drift Management* section of this label for additional information on proper application of Rely® 280.

Alion (Bayer):

CA label in tree nuts in fall 2011?

AI: Indaziflam (200 SC) - *CBI*

Tree crops	Nuts, citrus, pome, stone, grape, olive
Weed stage	Preemergent (broadleaves and grasses)
Tree age	B/NB?
Rate/A	5 to 6.8 fl oz
Tming	Dormant

Almond trial 2010

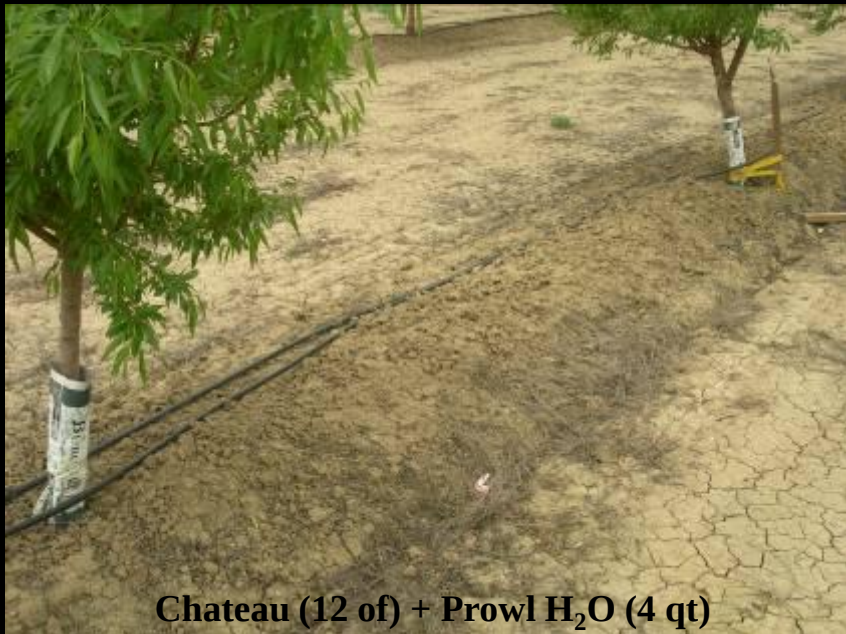


Untreated



Alion (5 floz)

45 DAT



Chateau (12 of) + Prowl H₂O (4 qt)



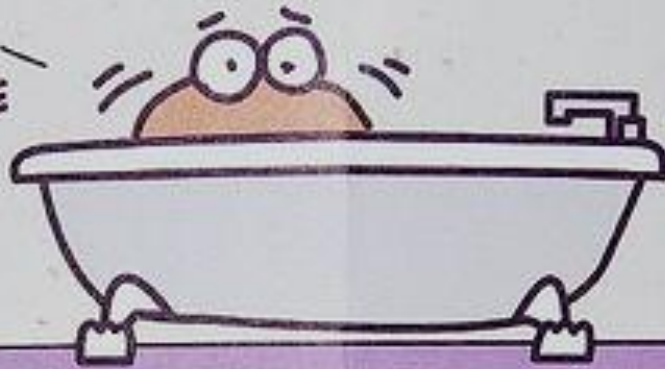
Alion (6.8 floz)

Almond weed control on (171 DAT)

Treatment	Rate/Acre	Pw	As	Ns	Fb
1. Untreated	----	0.0 d	0.0 c	0.0 d	0.0 f
2. Rely 200 + RU + AMS	5 pt + 1.5 qt + 15 lb/100 gal	9.4 b	10 a	9.5 ab	2.3 e
3. Alion + #2	5 floz	10 a	10 a	9.9 ab	8.1 b
4. Alion + #2	6.8 floz	10 a	10 a	9.7 ab	8.0 b
5. Alion + Matrix + #2	5 floz + 4 oz	10 a	10 a	9.9 ab	9.7 a
6. Alion + Goaltender + #2	5 floz + 3 pt	10 a	10 a	9.9 ab	8.3 b
7. Pindar GT + Prowl H ₂ O + #2	3 pt + 4 qt	10 a	10 a	10 a	8.2 b
8. Amore + #2	1.33 lb	10 a	10 a	10 a	7.0 c
9. Amore + Prowl H ₂ O + #2	1.33 lb + 4 qt	10 a	10 a	9.9 ab	6.3 c
10. Treevix + #2	1 oz	8.5 c	8.0 b	8.0 c	5.0 d
11. Treevix + Prowl H ₂ O + #2	1 oz + 4 qt	10 a	7.0 b	7.5 c	8.1 b
12. Chateau + Prowl H ₂ O + #2	12 oz + 4 qt	10 a	10 a	9.3 b	8.5 b
<i>CV(%)</i>		1.36	0.52	3.85	20.41
<i>LSD</i>		0.22	1.25	0.62	2.80

Stach on Hygiene

I THINK I WOULD
ENJOY BATHING MORE
IF I DIDN'T FLOAT.



Series B - 13 of 21



Questions?