

Impact of Weed Control Practices on Weed Communities in Vineyards

Richard Smith, Farm Advisor
University of California Cooperative Extension
Monterey County

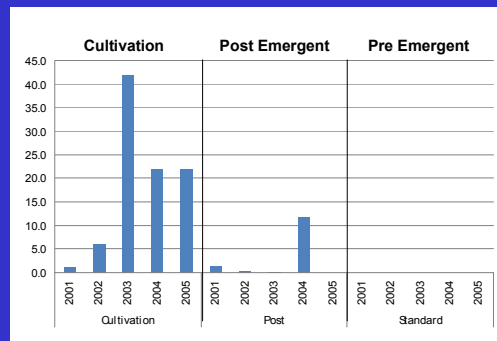
Changes in the Weed Populations over five years

- The trial was initiated in the 7th year of an established vineyard
- The weed control program prior to the initiation of the trial was a combination of cultivation and postemergence applications of Roundup + Goal
- This weed control program provided excellent suppression of the weeds in the vineyard and we assume that all plots had similar weed populations at the start of the trial

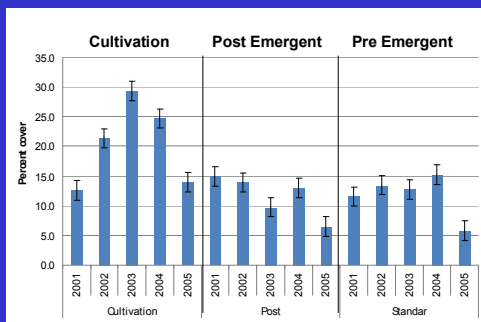
Weed Control Treatments On Vine Row Berms

- Preemergence (Standard):
 - Simazine + Goal preemergence in winter
 - Followed by post emergent applications of Roundup + Goal in summer
- Cultivation:
 - Cultivator used as needed (i.e. 1/month in summer)
 - Hand hoeing used as needed around trunks
- Post emergent:
 - Roundup + Goal (+Rely) in spring and summer

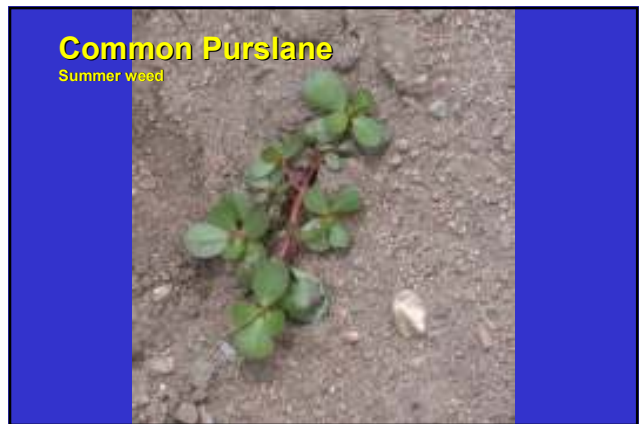
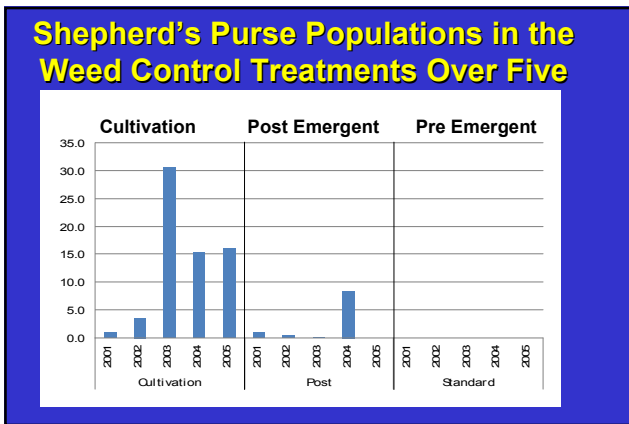
Winter/Spring Weeds Five Year Trend



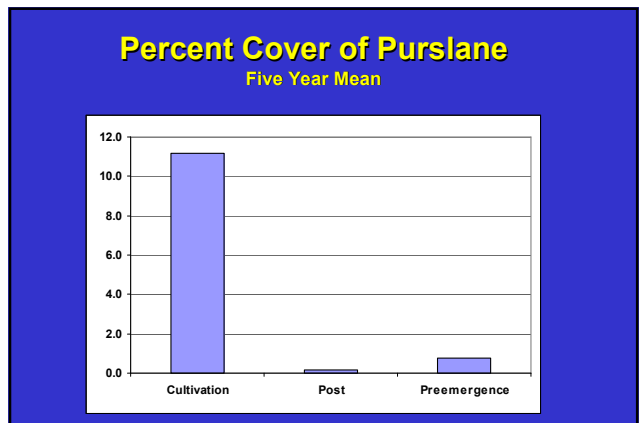
Summer/Fall Weeds Five Year Trend



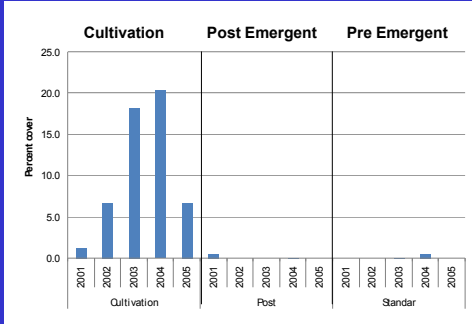
Cultivation Treatment



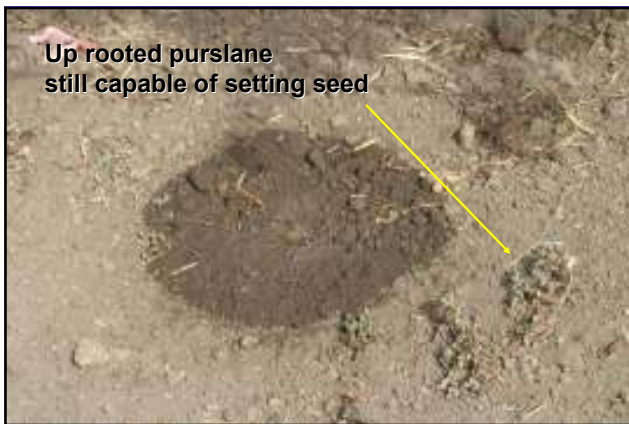
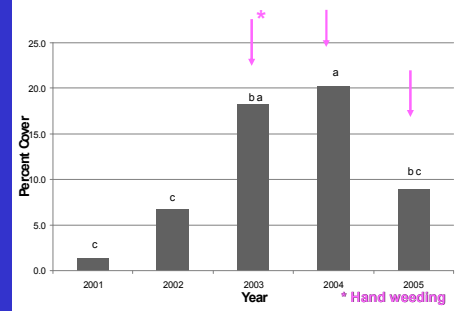
- ### Purslane Biology
- Purslane is capable of rapid growth and absorbs and stores water
 - It stores water in specialized cells that are covered with a thick cuticle
 - It is capable of setting seed after being uprooted due to this high water content
 - This is a strategy for survival and invasion



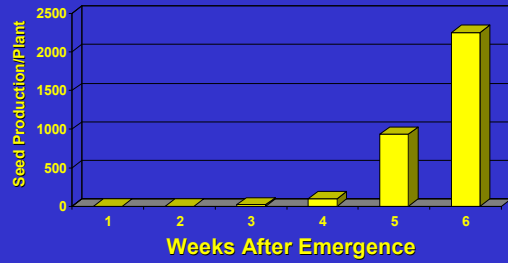
Purslane Population in Weed Control Treatments Over Five Years



Purslane Population in the Cultivation Treatment Over Five Years

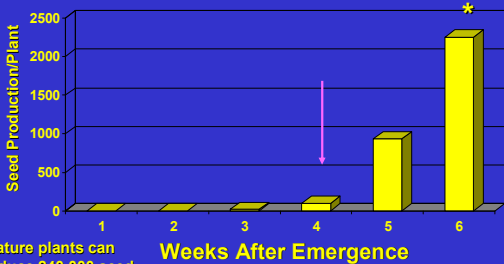


Seed Set by Uprooted Purslane Plants



Haar and Fennimore, 2003

Seed Set by Uprooted Purslane Plants



* Mature plants can produce 240,000 seed

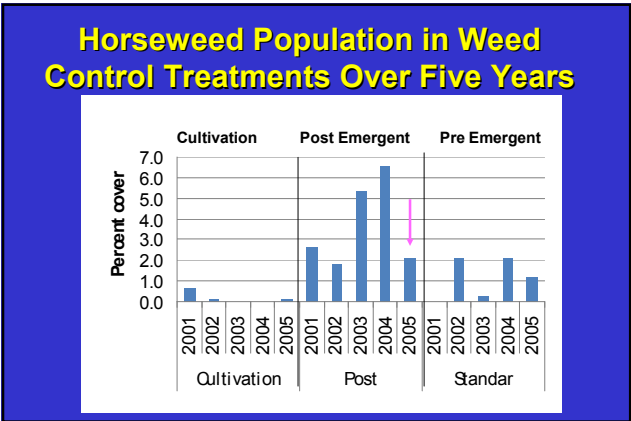
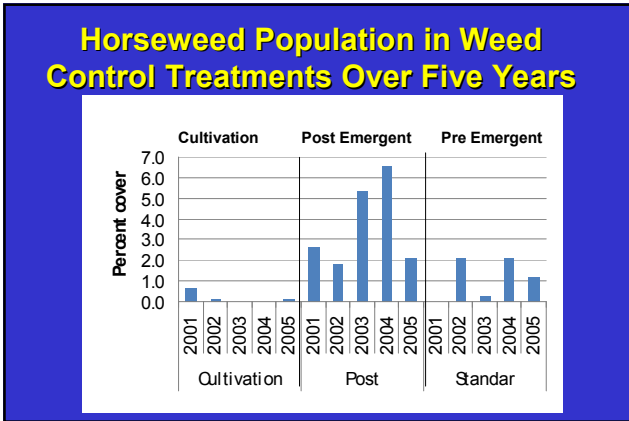
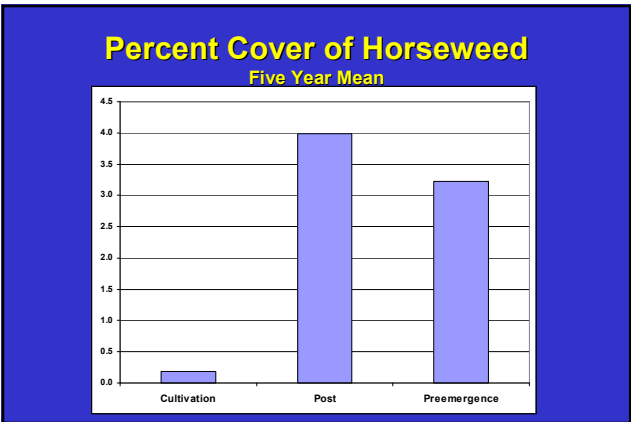
Haar and Fennimore, 2003



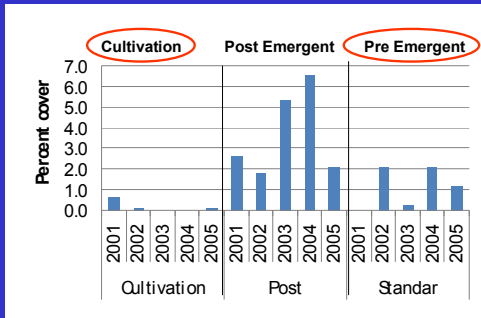
Purslane around base of vines



Post Emergent Treatment



Horseweed Population in Weed Control Treatments Over Five Years



Horseweed

Susceptible to cultivation and Simazine
Tolerant of Roundup + Goal
Susceptible to Rely



Horseweed



Horseweed following treatment with Rely

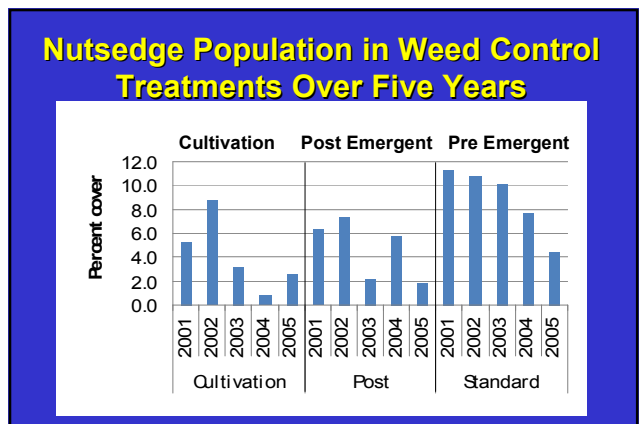
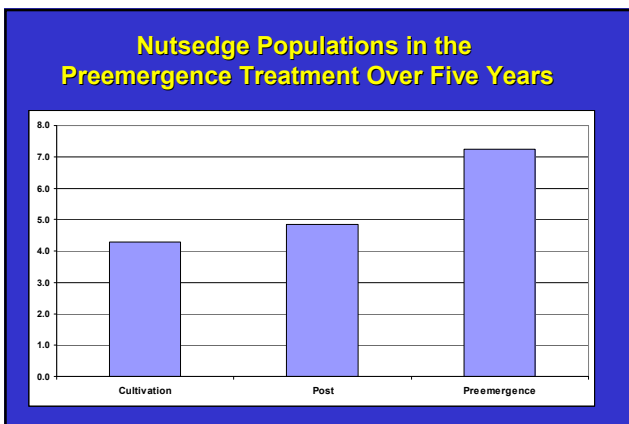


Post Emergent Treatment



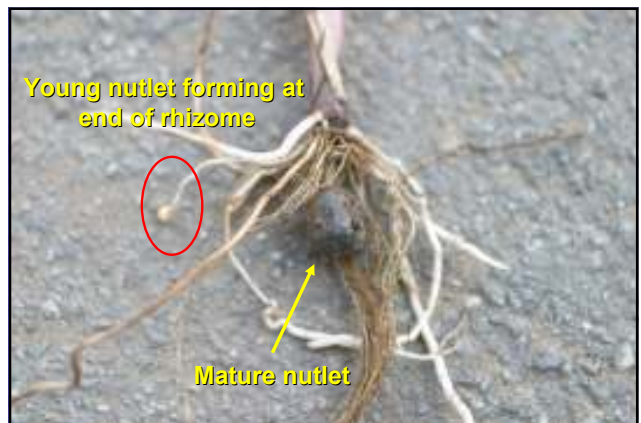
Preemergence Treatment





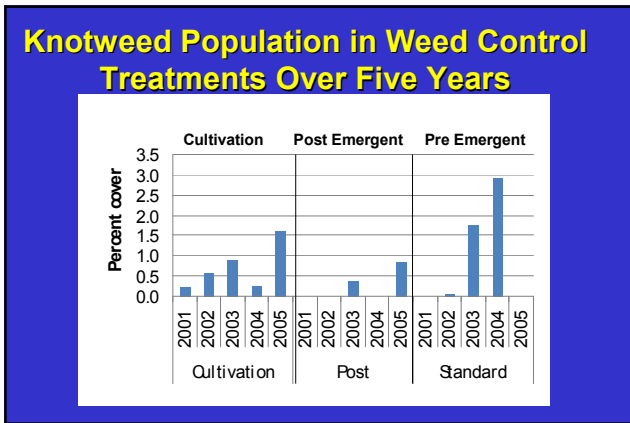
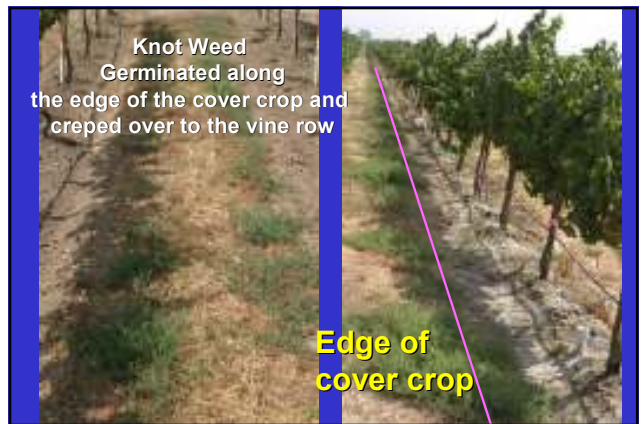
Nutsedge Control with Glyphosate

- It is possible, but multiple applications are required
- Timing affects the effectiveness of applications
 - Early applications reduced nutlet formation
 - The glyphosate moves to the tips of the rhizomes
 - As plants matured the impact of glyphosate on tubers decreased as the tubers mature and become dormant





Special Weed Concern



Effect of Weed Control Treatments on Plant and Soil Nutrition Over Five Years

Plant Nutrition

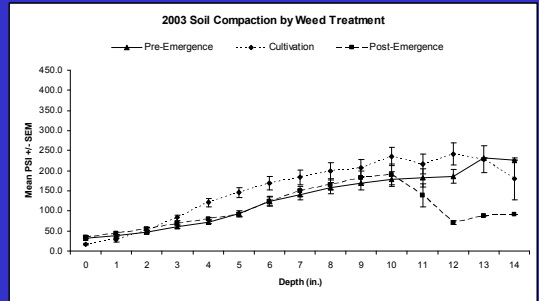
- Weed treatments had no effect on leaf blade or petiole nutrient levels in any year

Soil Nutrient Status

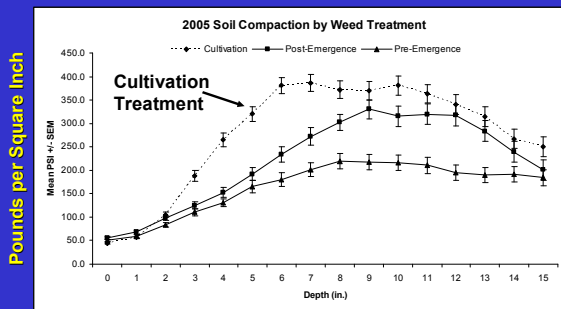
- Nitrate was lower in the cultivation treatment in 2005
- Extractable Zinc was lower in 2003 and 2005

Soil Physical Properties

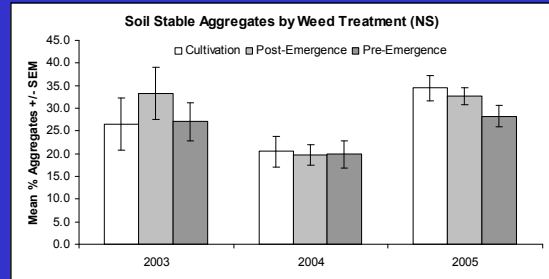
2003 Soil Compaction Evaluation



2005 Soil Compaction Evaluation

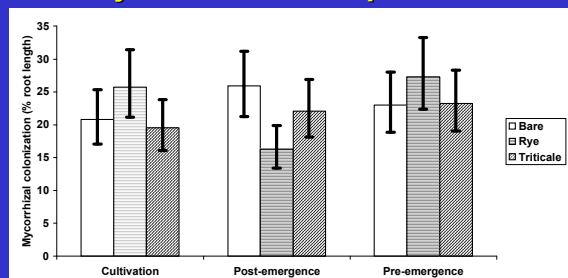


Water Stable Soil Aggregates

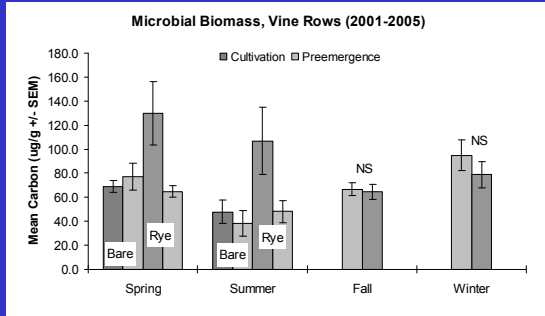


Soil Microbiological Properties

Impact on Mycorrhiza Weed Control Treatments Interaction with Adjacent Cover Crops 2003-2005



Microbial Biomass In Vine Rows



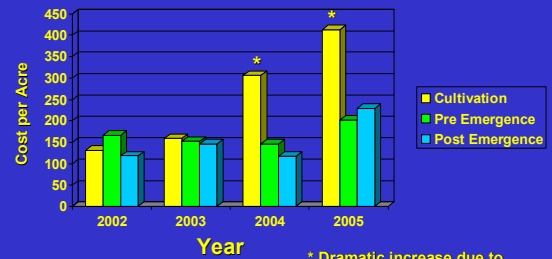
Impact of Weed Control Treatments on Grape Yield

- Weed control treatments had no effect on vine growth
- Cover crop treatments, when averaged over the five years, also had no significant effect on vine growth
- However, in 2001 and 2005 the triticale 'Trios 102' treatment significantly reduced pruning weights
- Lowered pruning weights may be related to later growth, thus greater soil water use, by 'Trios 102' than 'Merced' rye or bare row middles

Impact of Weed Control Treatments on Grape Quality

- No differences in crop yield or fruit composition were measured from 2001 to 2005 due to weed control treatments

Comparison of Weed Control Costs



* Dramatic increase due to hand weeding

Cover crops killed at different ages



Acknowledgements:
 Growers:
 Jason Smith and Daryl Salm
 Funding:
 Western SARE
 Viticulture Consortium

