

Alternatives to Burning Crop Residues in Alfalfa Grown for Seed:



Economic/Pest Management Impacts and Interactions Between Selected Burning Alternatives and Precision Crop Spacing

Plot design

- Row spacings at 22" or 30"
- Seed spacing at 1 5/8" or 3 3/8"
- Treatments- burning, tilling, mowing, or do nothing.

The plots were established in summer 2007 and grown out by the Wagoners through 2008. In February 2009 we applied the burning, mowing and tilling treatments.





Field burning spring 2009



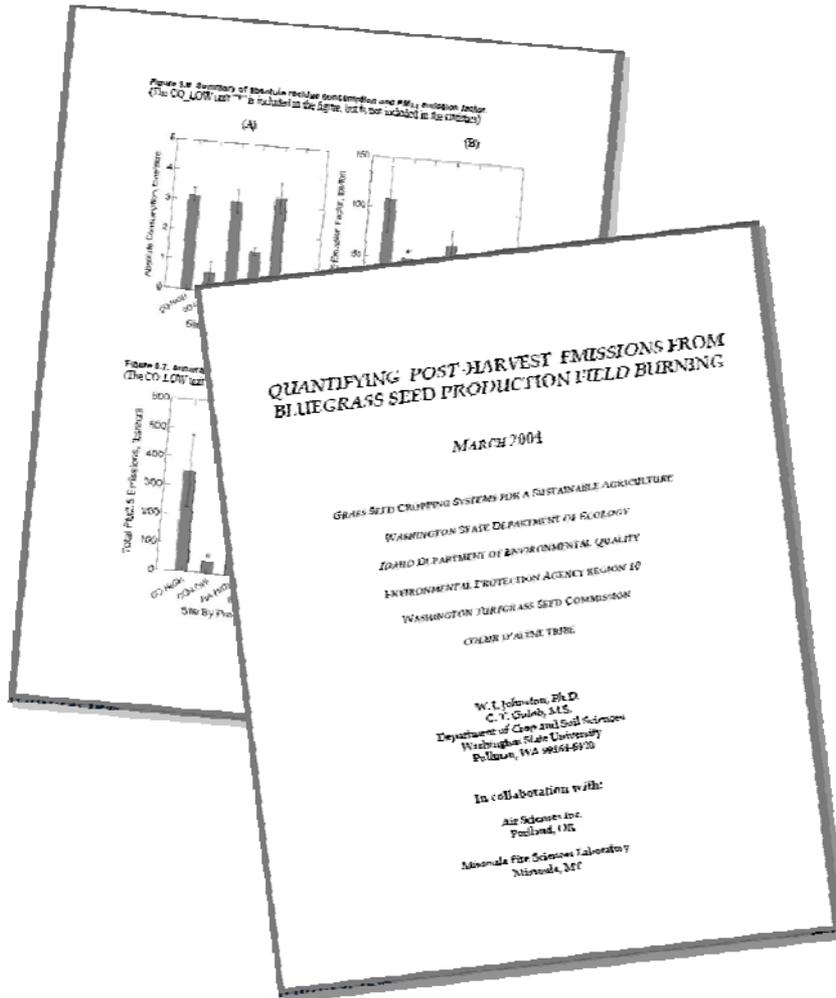
Research plots after burning spring 2009

Looking at Emissions

Johnston, W.J. & C. T. Golob.
2004

Quantifying post-harvest emissions from bluegrass seed production field burning

http://www.ecy.wa.gov/programs/air/aginfo/research_pdf_files/FinalKBGEmissionStudyReport_4504.pdf



Extrapolating from Johnston & Golob, when a burn was conducted on stubble left in a “low load” grass seed field 0.9 tons of combusted residue resulted in:

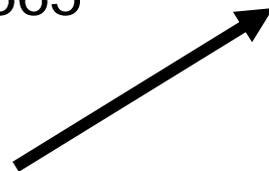
- 2,881 lbs of CO₂
- 291 lbs of CO
 - 18 lbs CH₄
- 58 lbs PM_{2.5}
- 73 lbs of PM₁₀

Combustion efficiency was calculated at 87%

Emissions Winter 2009

Spacing	22x1-5/8	22x3-3/8	30x1-5/8	30x3-3/8
Residue/Acre	0.73 tons	0.54 tons	0.61 tons	0.58 tons

CO ₂ lbs	2337	1729	1953	1857
CO lbs	309	228	258	245
CH ₄ lbs	29	22	24	23
PM _{2.5} lbs	42	31	35	45
PM ₁₀ lbs	53	39	44	42
Seed '08 (lbs)	571	565	899	696



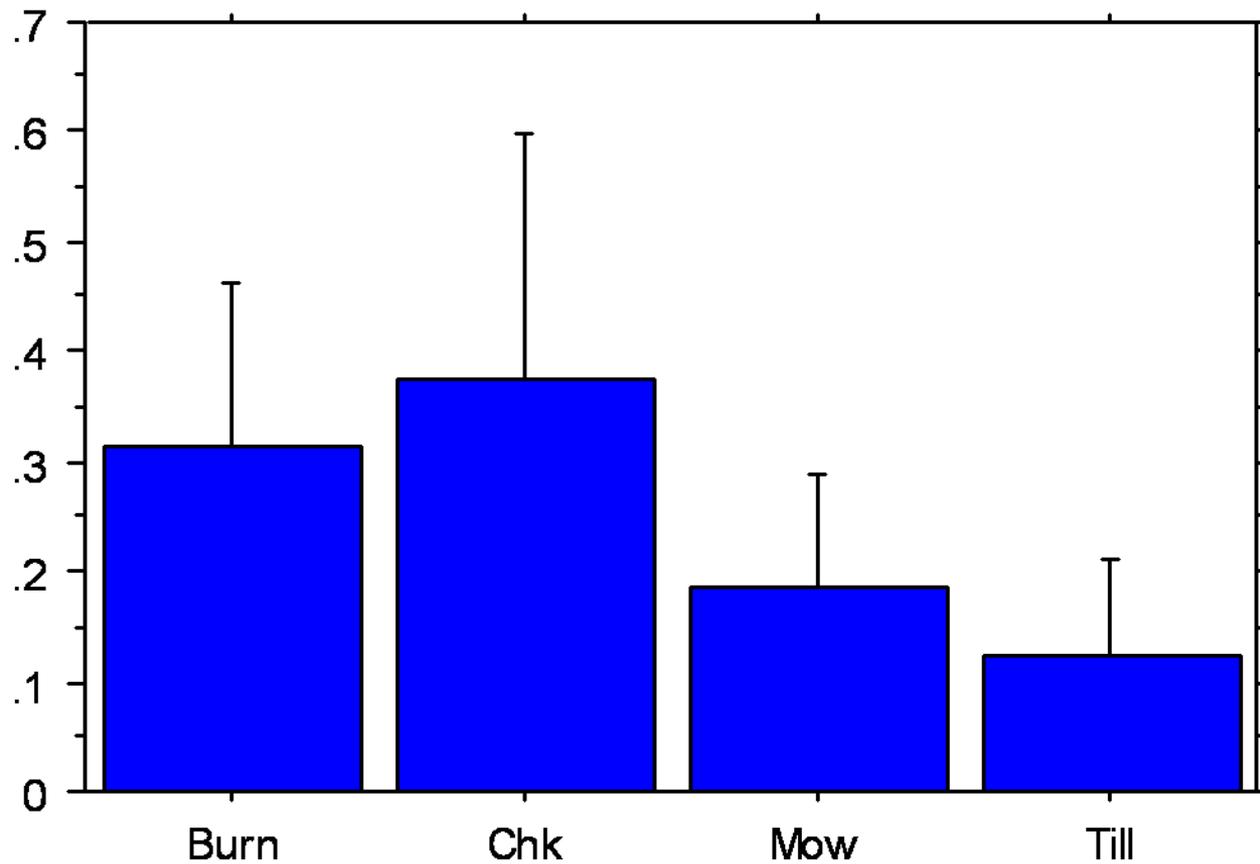
In the establishment year we were able to optimize yield and reduce emissions with this plant spacing.

Spring 2009 Insects

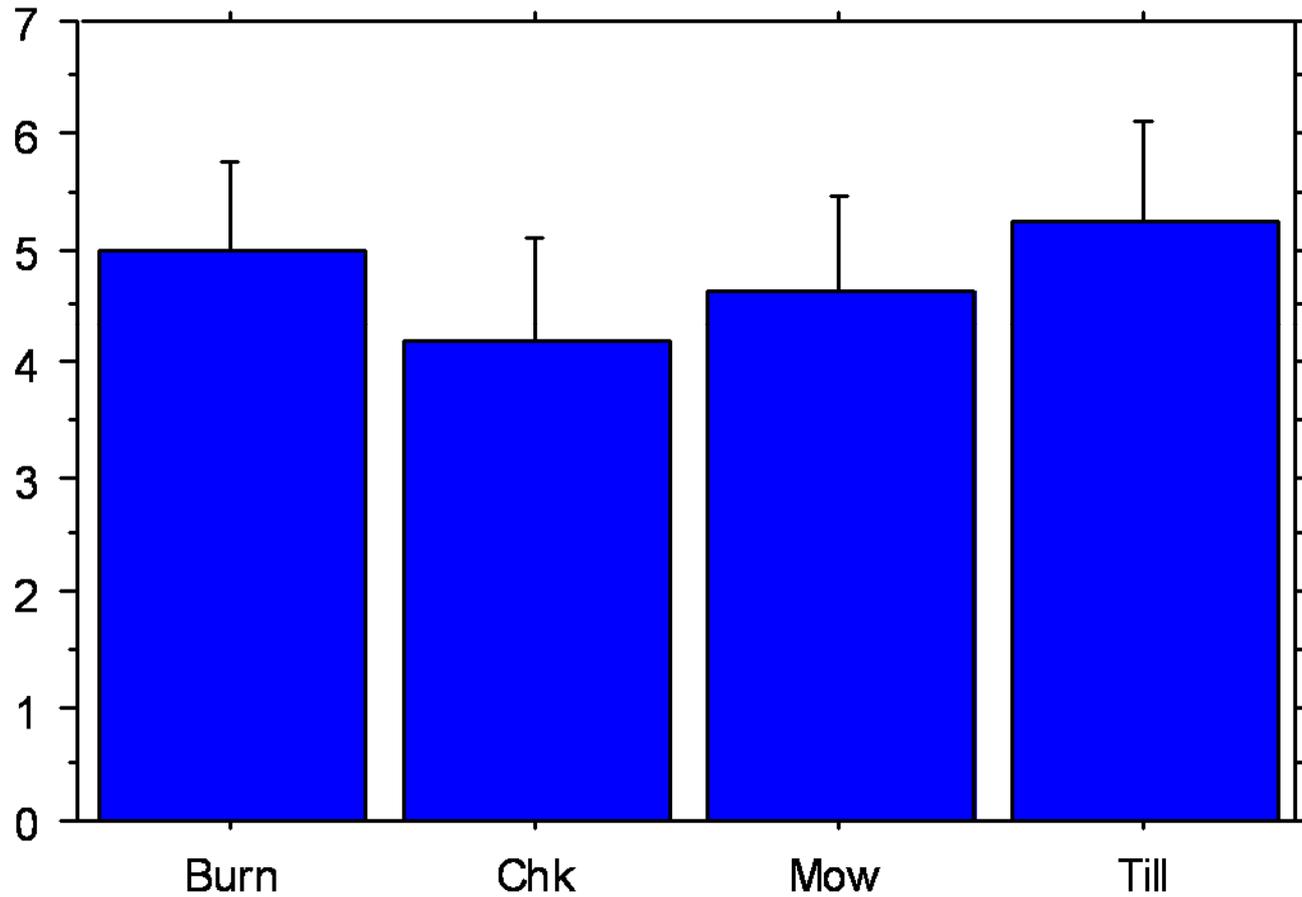
- Population assessments of pest and beneficial arthropods were taken by sampling the research plots with sweep nets, yellow sticky cards, and pitfall traps.
- Amber Vinchesi went through all these in Fall 2009



Blister beetles \pm Std error in pitfall traps
March 30, 2009

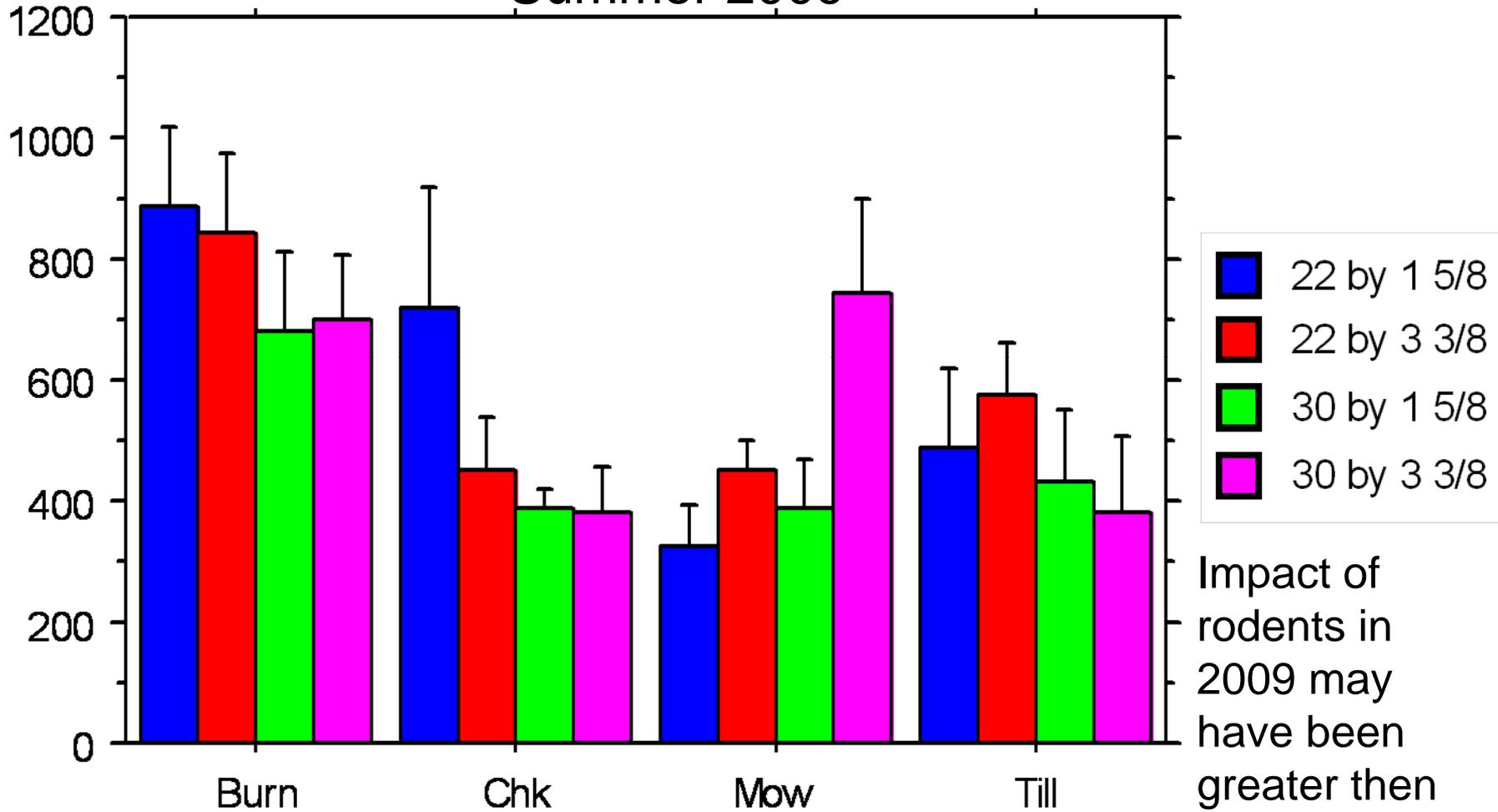


Alfalfa weevils \pm Std error in pitfall traps
March 30, 2009



Seed Yield in Pounds per Acre \pm Std error

Summer 2009



Impact of rodents in 2009 may have been greater than the not burning?