

Evaluation of BQMulch for Control of Sclerotinia Minor in Lettuce Production

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Project Background



The Lettuce Board funded us to examine the potential of mustard cover crops to reduce the incidence of *Sclerotinia minor* and weeds in lettuce.

Our project was extended to examine BQ Mulch based on positive results that were seen with this mustard cover crop in Australia

2006-07 Objectives

1. Complete evaluations of Indian and white mustards
2. Evaluate the efficacy of BQMulch in reducing *Sclerotinia minor* infection and weeds

Brief Review of Project Findings

- Mustard cover crops are susceptible to *Sclerotinia minor* which is a highly undesirable characteristic
- Probably as a result of the above finding, the impact on mustard cover crops on *Sclerotinia* infection in the field has been mixed
- Mustards have been shown to reduce weeds in high weed populations, but more difficult to observe this effect in low weed population fields

| Variety | Species | 30 days | 60 days | 80 days |
|---------------------|-------------------------------------|--------------------|--------------------|--------------------|
| PacificGold | <i>B. Juncea</i> | D | D | H |
| IdaGold | <i>S. alba</i> | D | D | D |
| Martigena | <i>S. alba</i> | D | D | D |
| Nematrap | <i>S. alba</i> | D | D | H |
| Caliente 105 | <i>S. alba and B. juncea</i> | D | D | D |
| <u>Humus</u> | <i>B. napus</i> | H | H | H |

**Notable Sclerotia production
on mustard tissue**

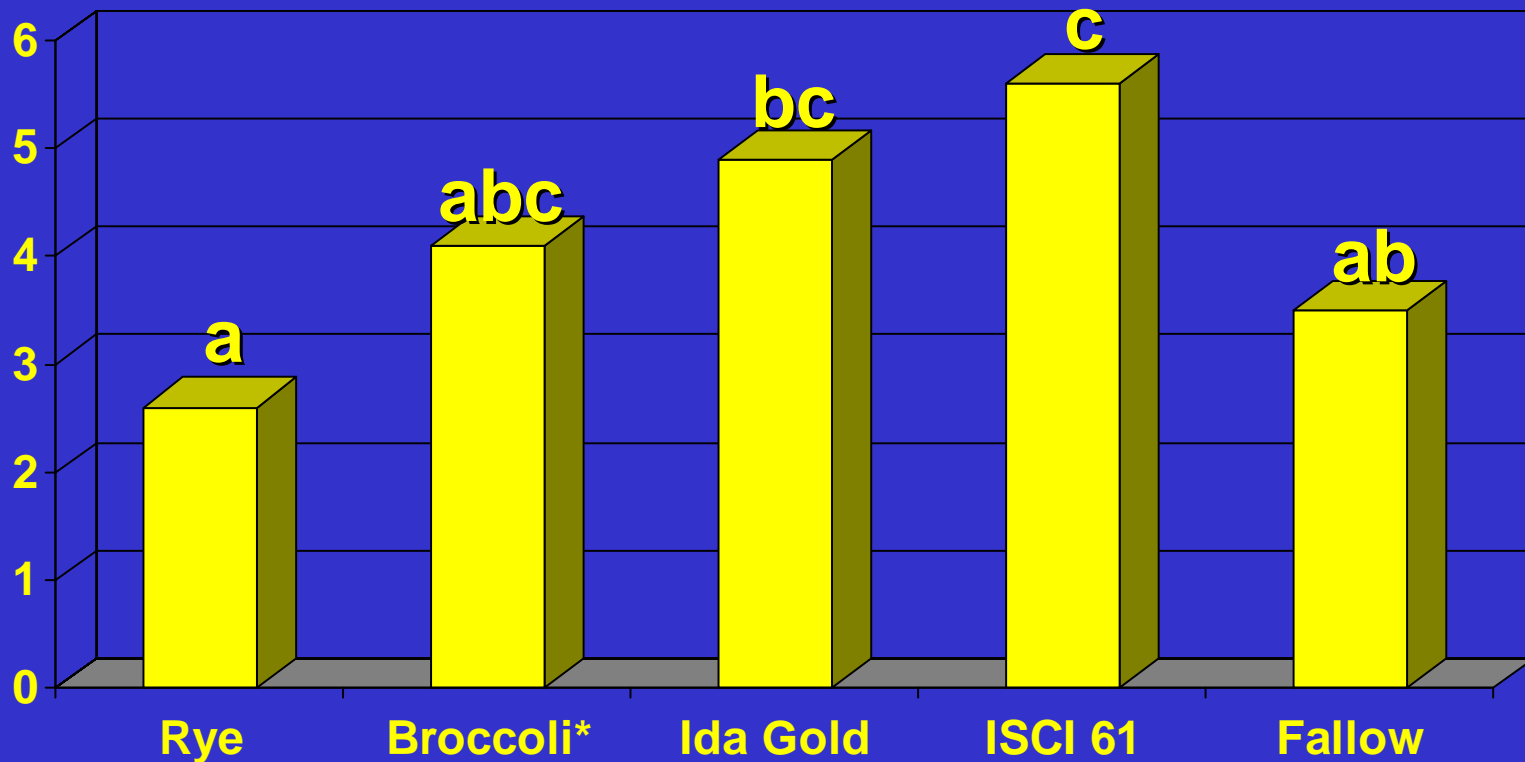


Soil Sclerotia and Lettuce Infection

Summary of Seven Trials

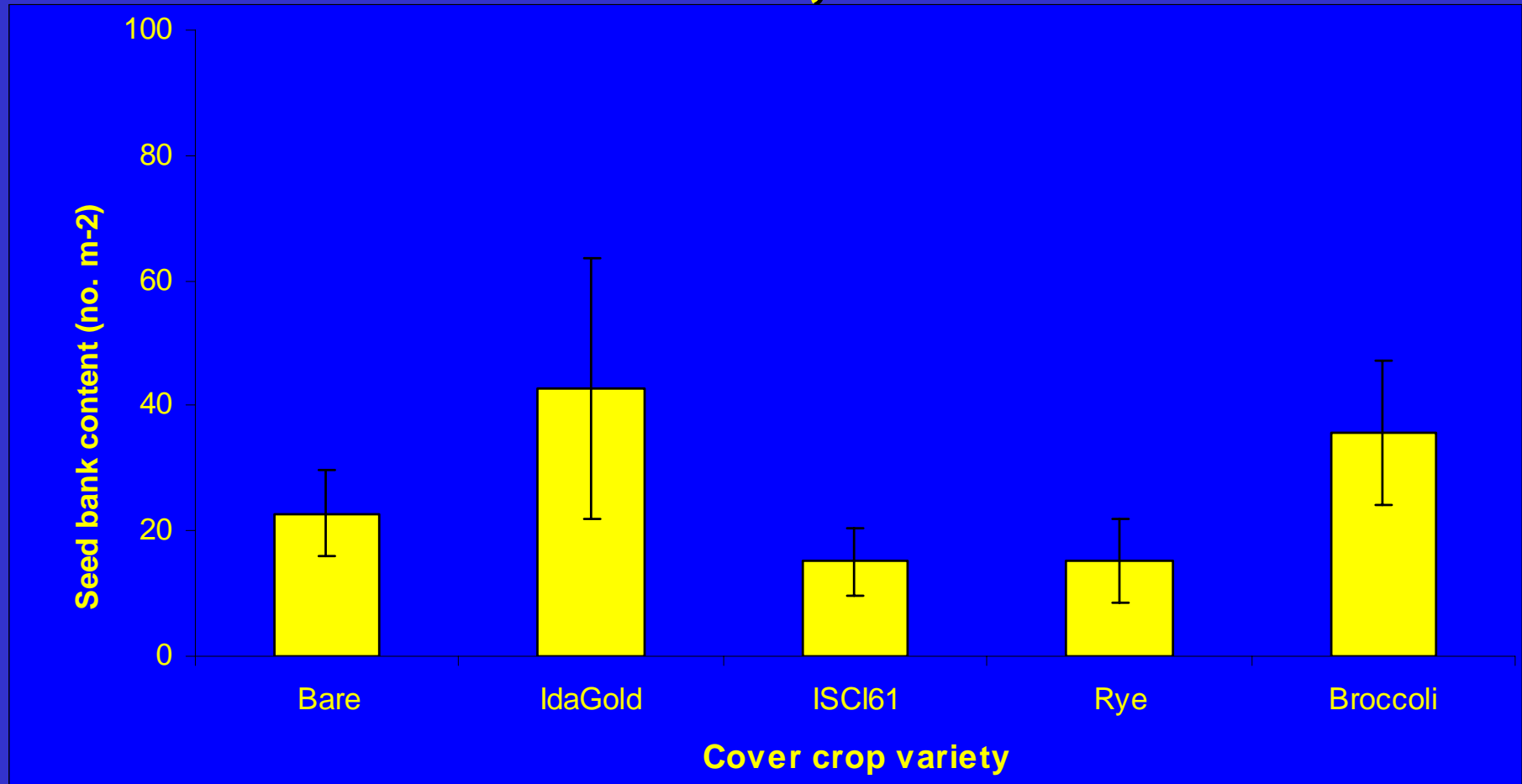
| Treatment | Soil Sclerotia | | Infected heads (percent) |
|-----------|----------------|-----------------|--------------------------|
| | Pre cover crop | Post cover crop | |
| Mustard | 27.7 | 9.2 | 2.8 |
| Bare | 17.7 | 9.6 | 4.9 |

Percent Infection by *S. minor* on Summer Lettuce Crop, 2005 (after two cover crop cycles and 4 lettuce cycles)



* Did not grow normally

Mustard Cover Crop Rotational Plot Evaluation of the Soil Seed Bank March 28, 2005



Vapam Equivalency of Mustard Cover Crops

- Label rates for Vapam are in the range of 37.5 to 75 gallons/A
- The equivalent quantity of methyl isothiocyanates (biofumigant constituent) in mustard cover crops that we measured in the rotation plot was a fraction of what is commercially applied: 2 – 5 gallons/A

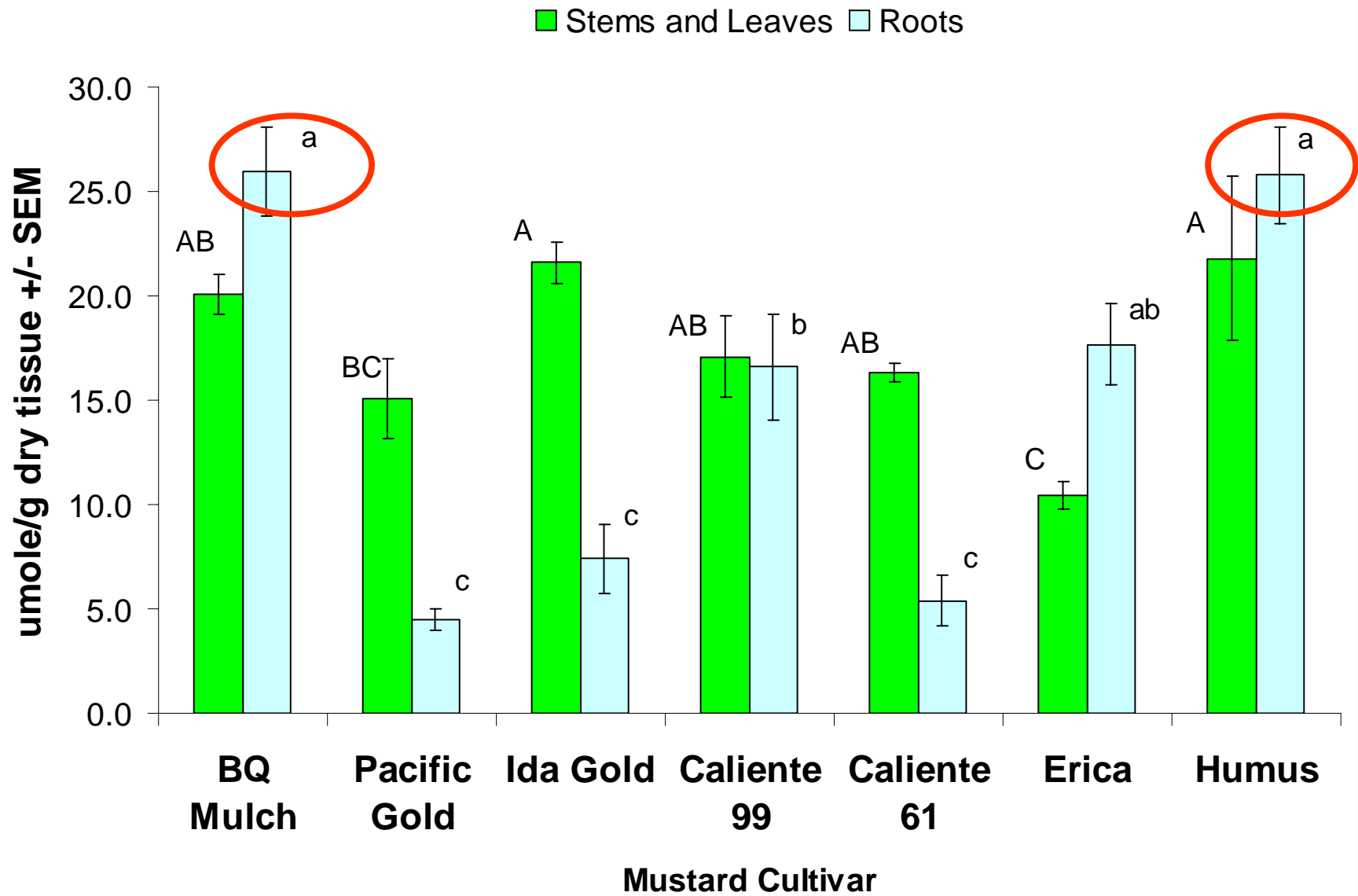
Yield Evaluations Long-term Plot First Crop Following Cover Crops

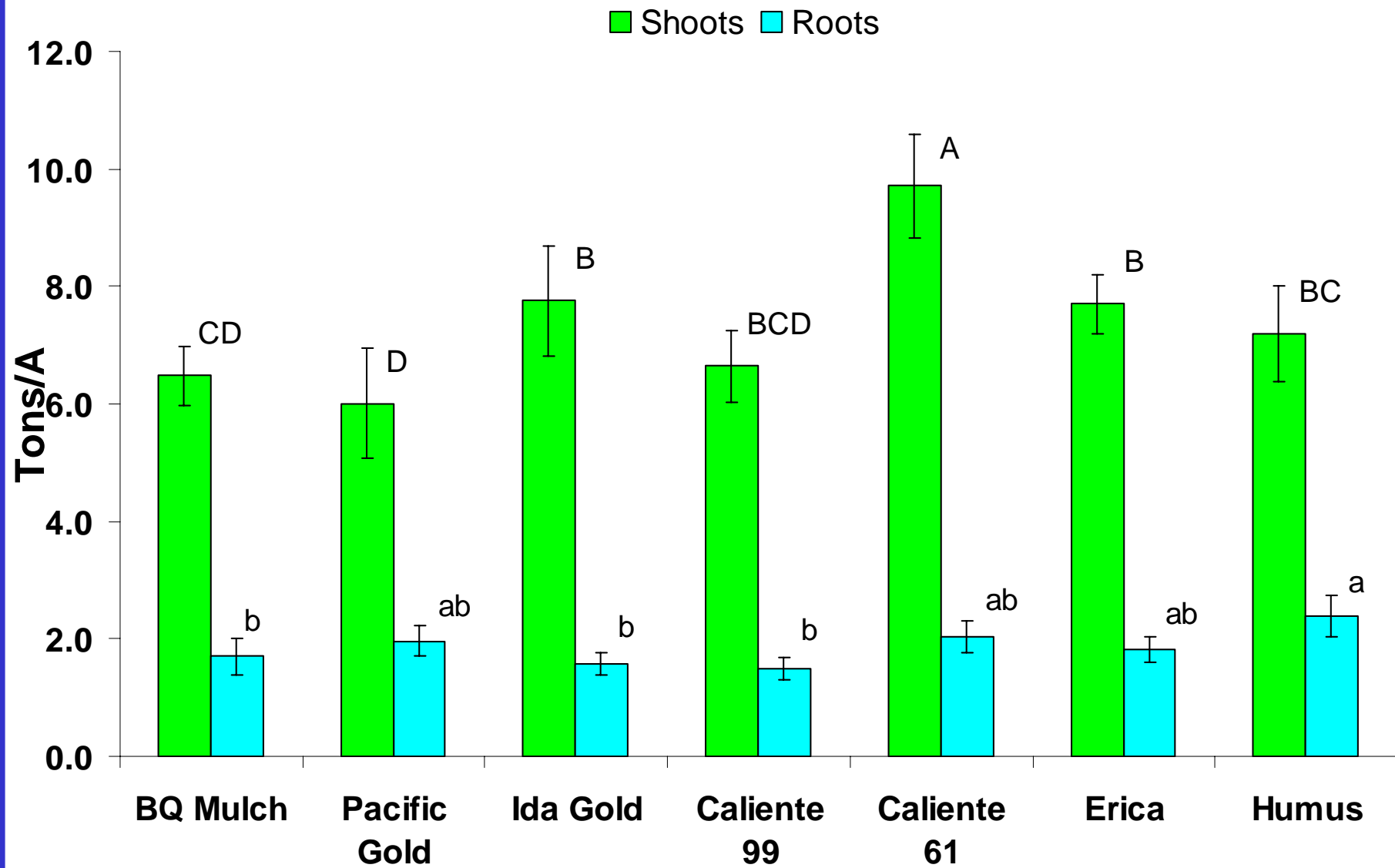
Mean head wt.

| Cover Crop | April 2004 | June 2005 |
|-----------------------------|------------|-----------|
| Cereal Rye 'Merced' | 1.47 | 2.18 |
| Broccoli 'DiCicco' | 1.47 | 2.11 |
| White Mustard 'Ida Gold' | 1.43 | 2.26 |
| Indian Mustard 'ISCI 61' | 1.53 | 2.22 |
| Bare Fallow | 1.32 | 2.08 |
| LSD (0.05) | 0.13 | 0.12 |

BQMulch Evaluations

- **Two on-farm evaluations**
- **A two season rotational plot at Hartnell East Campus**
- **Two variety screening evaluations**
 - **Measuring glucosinolate content of the tops and roots (do the roots significantly contribute to biofumigation and more efficiently deliver the biofumigant to the soil?)**





BQ Mulch Strip





2006 Weed Evaluations

| Cover Crop | Hartnell | Grower 1 | Grower 2 |
|--------------------------------|-----------------|-----------------|-----------------|
| Cereal Rye 'Merced' | 31.0 | ---- | ---- |
| 'BQMulch' | 21.3 | 16.1 | 5.3 |
| 'Caliente 99' | 38.0 | 20.8 | 3.8 |
| Bare Fallow | 43.5 | 48.1 | 5.4 |

2006 On-Farm Sclerotinia Evaluation

| Cover Crop | Grower 2 Sclerotinia Percent | Grower 2 Botrytis Percent | Hartnell Percent Infection | Hartnell Soil Sclerotia |
|--------------------------------|---|--|---|--|
| Cereal Rye 'Merced' | ---- | ---- | 3.4 | 2.1 |
| 'BQMulch' | 2.8 | 26.8 | 4.1 | 2.7 |
| 'Caliente 99' | 2.6 | 26.9 | 3.1 | 2.8 |
| Bare Fallow | 3.5 | 28.2 | 4.1 | 3.9 |



Caliente 99 (rest of field)

BQ Mulch regrowth



Conclusions

- BQMulch did not provide additional control of *S. minor* over the varieties currently used
- BQMulch did reduce weed pressure in one trial
- There was higher glucosinolate concentration in the roots of the BQMulch varieties, but high glucosinolate concentration was also observed in Caliente 99, a commonly use variety in the Salinas Valley
- BQMulch resprouts and can be a nuisance in subsequent lettuce plantings

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