Effects of Cover Crops on a Northern California Vineyard Ecosystem

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Experimental Methods
Vineyard

- Merlot on 5BB, eastern Sac. County
- 2.1 x 3.3 m (7 x 11 ft.)
- Planted 1993
- Drip irrigated, fertigated

Experimental Methods
Cover Crop Mixes

Fall 1996:

- Calif. native perennial grass (NT)

Fall 1997:

- Annual clover (NT)

Fall 1997-99

- Bell bean / vetch / pea / oat (D)
- Barley / oat (D)
- Disked control (D)

Experimental Methods
Cover Crop Fertilization

45 kg/ha N/year (urea):

- Calif. native perennial grass
- Barley / oat

No additional fertilizer:

- Annual clover
- Bell bean / vetch / pea / oat
- Disked control

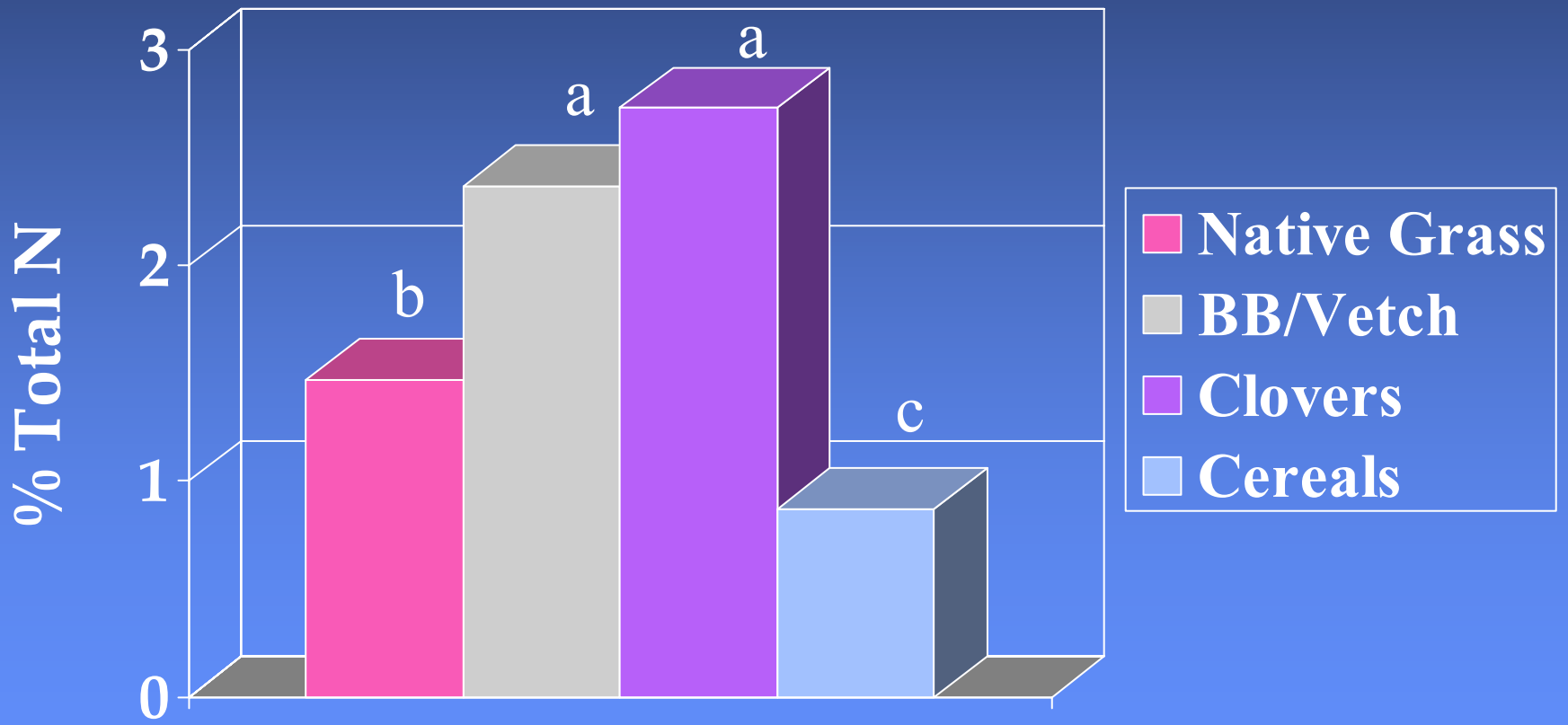
Results
(3 Year Study)

Little or no effect on:

- Yield
- Juice quality
- Vine water stress

Cover Crop N Content

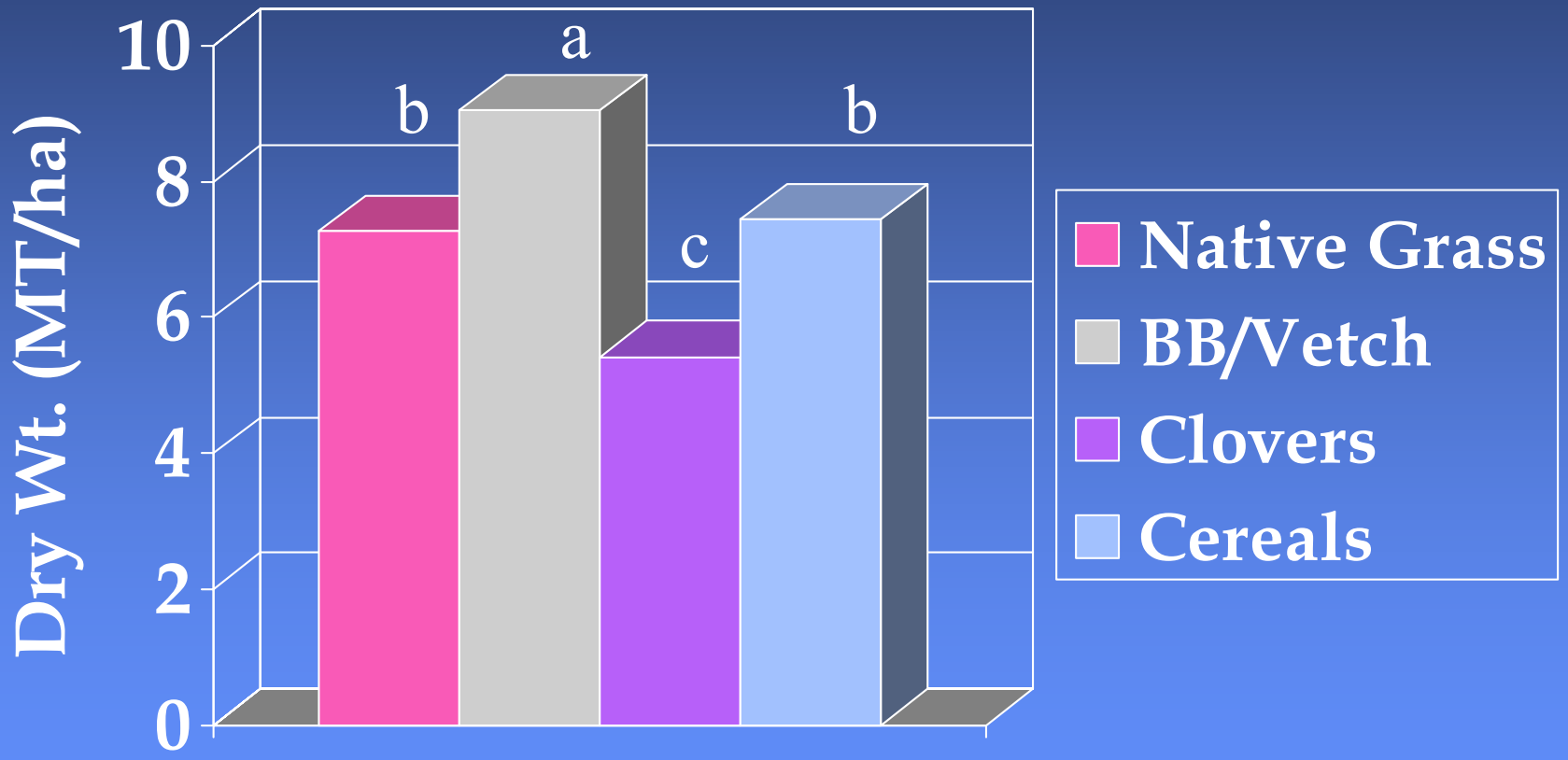
1998-2000



(LSD, p>0.05)

Cover Crop Biomass

April, 1998

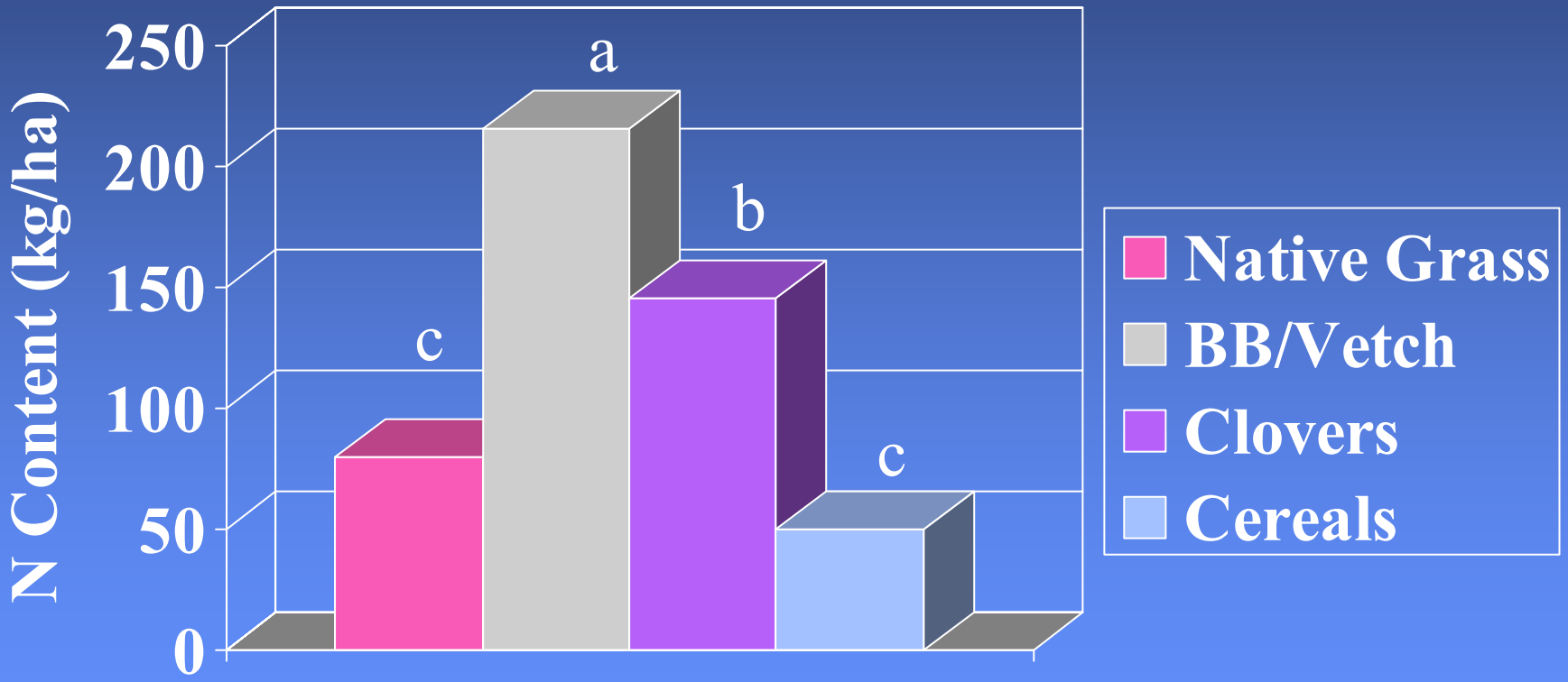


(MT/ha X 0.46 = tons/acre)

(LSD, $p>0.05$)

Cover Crop N Content

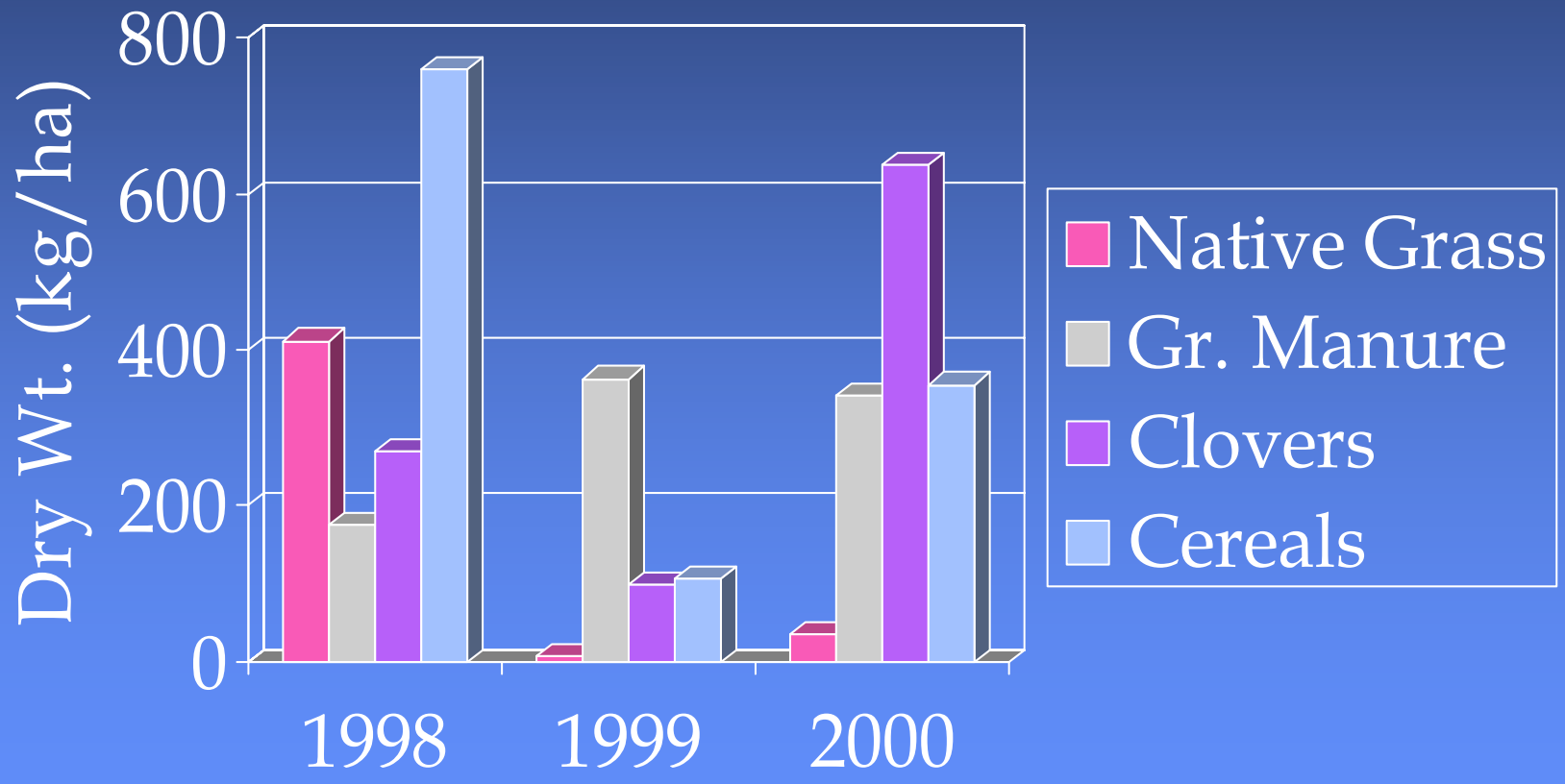
April, 1998



(kg/ha X 0.9 = lbs./acre)

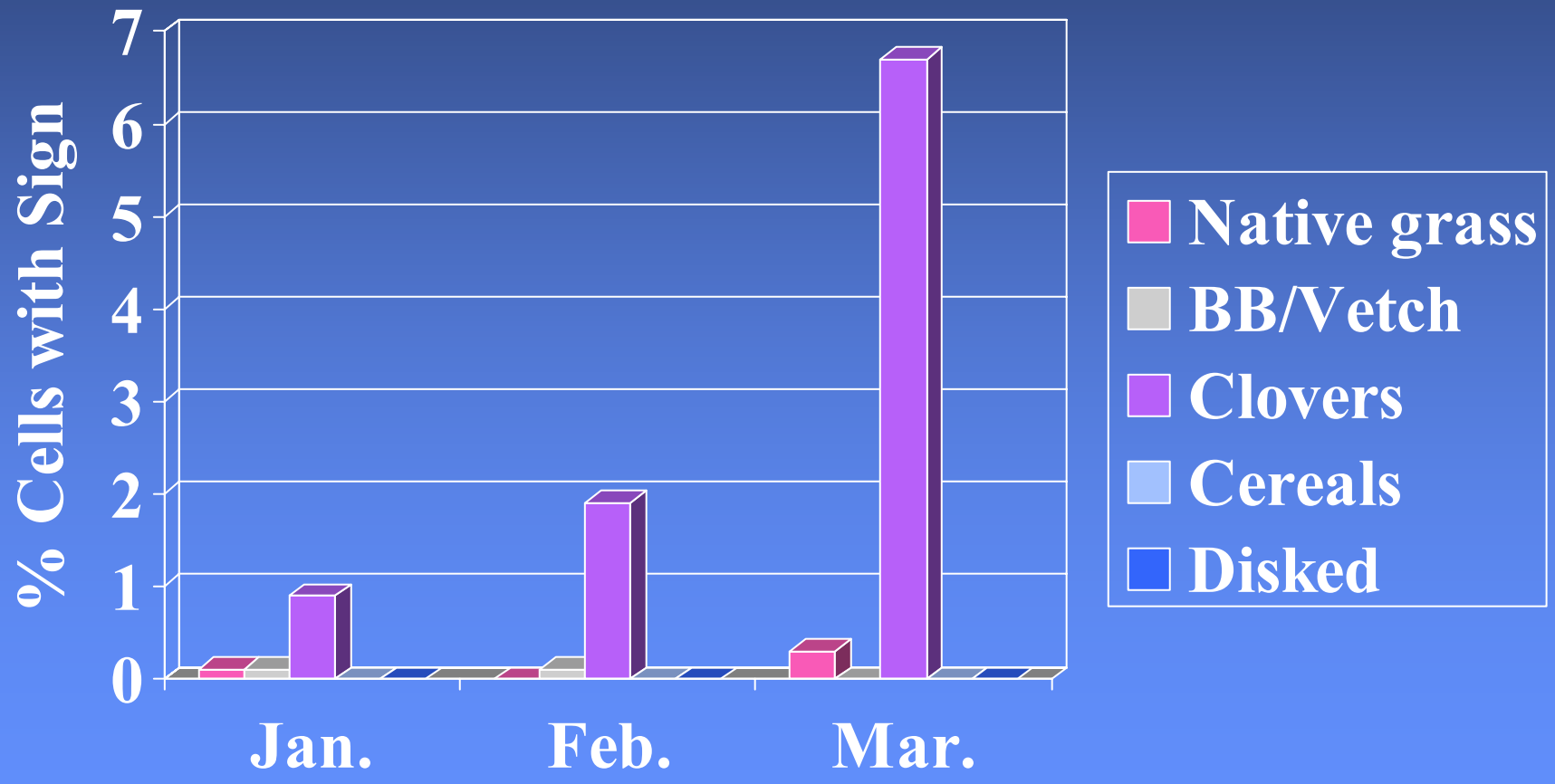
(LSD, $p>0.05$)

Weed Biomass

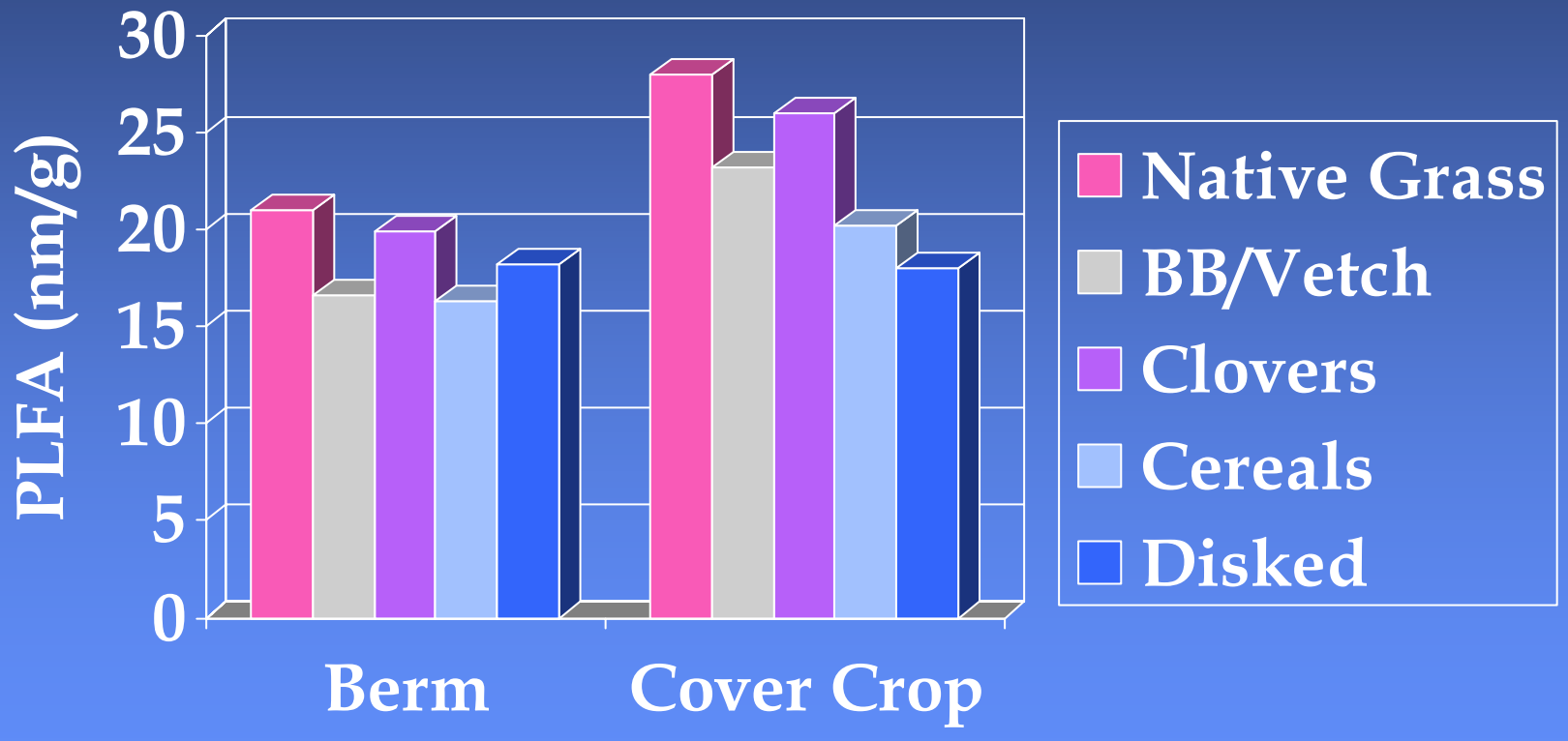


Pocket Gophers

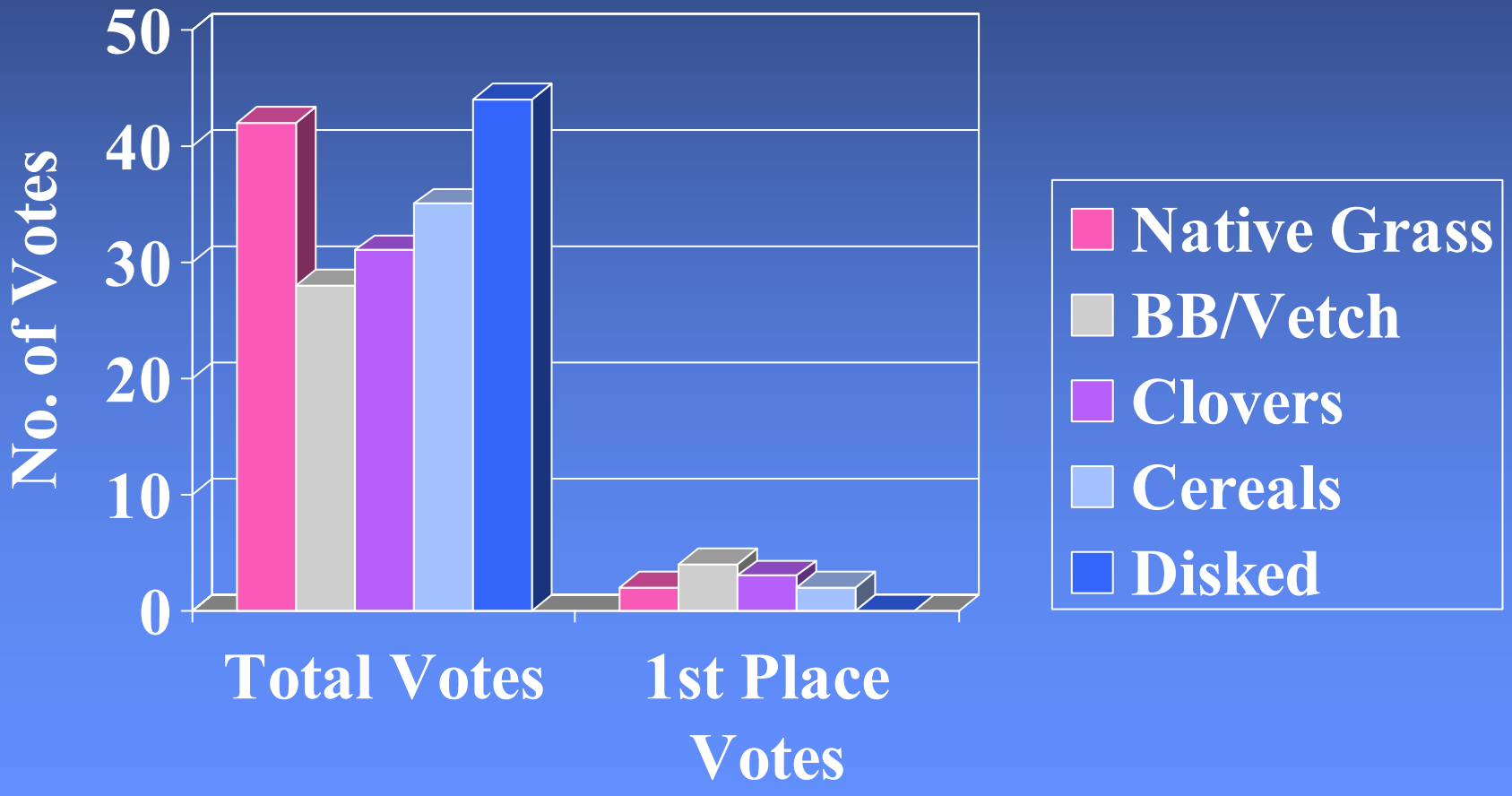
1999



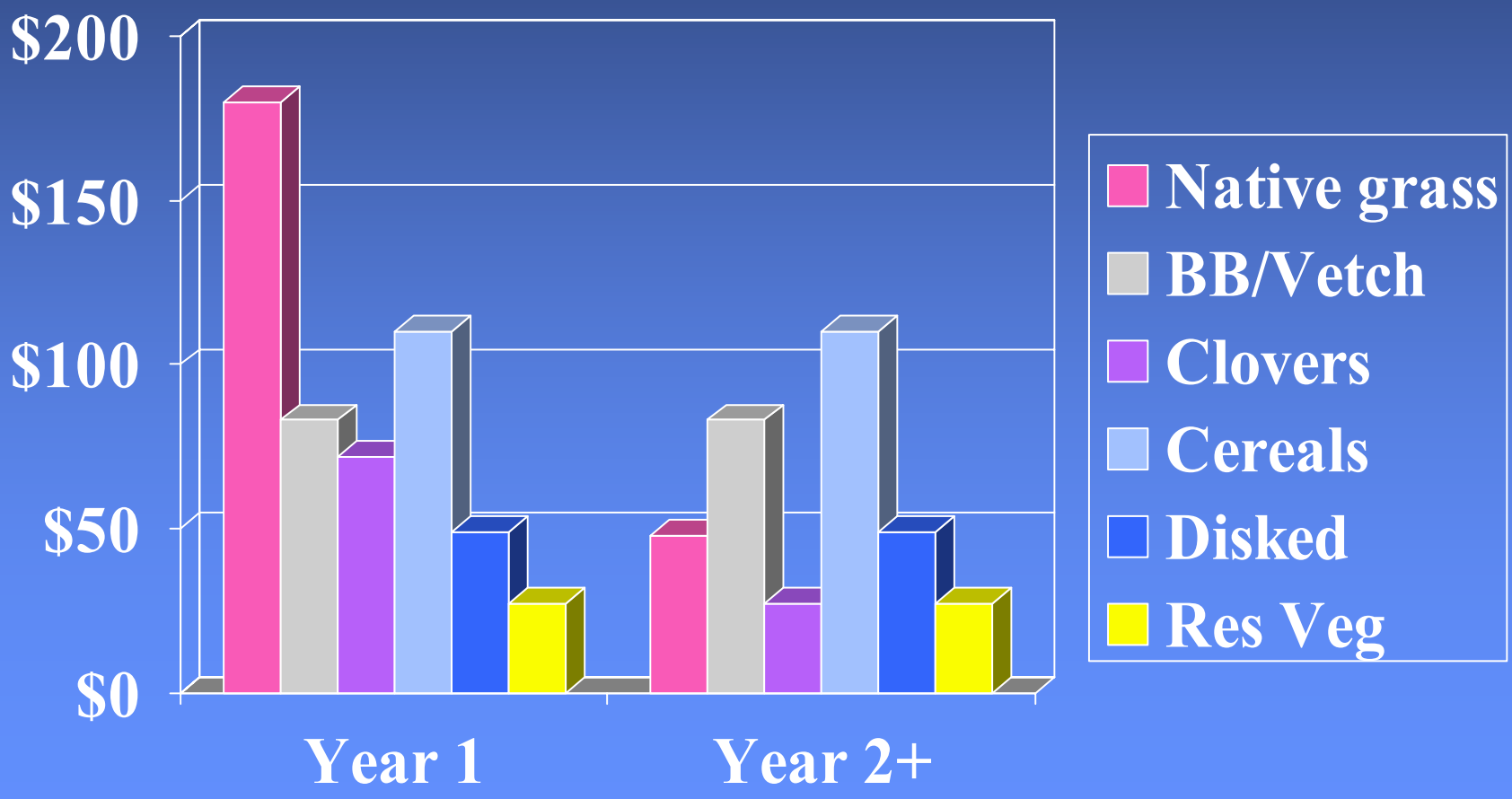
Soil Microbial Biomass



Wine Quality



Cover Crop Costs per Acre
(Planted Every Row)



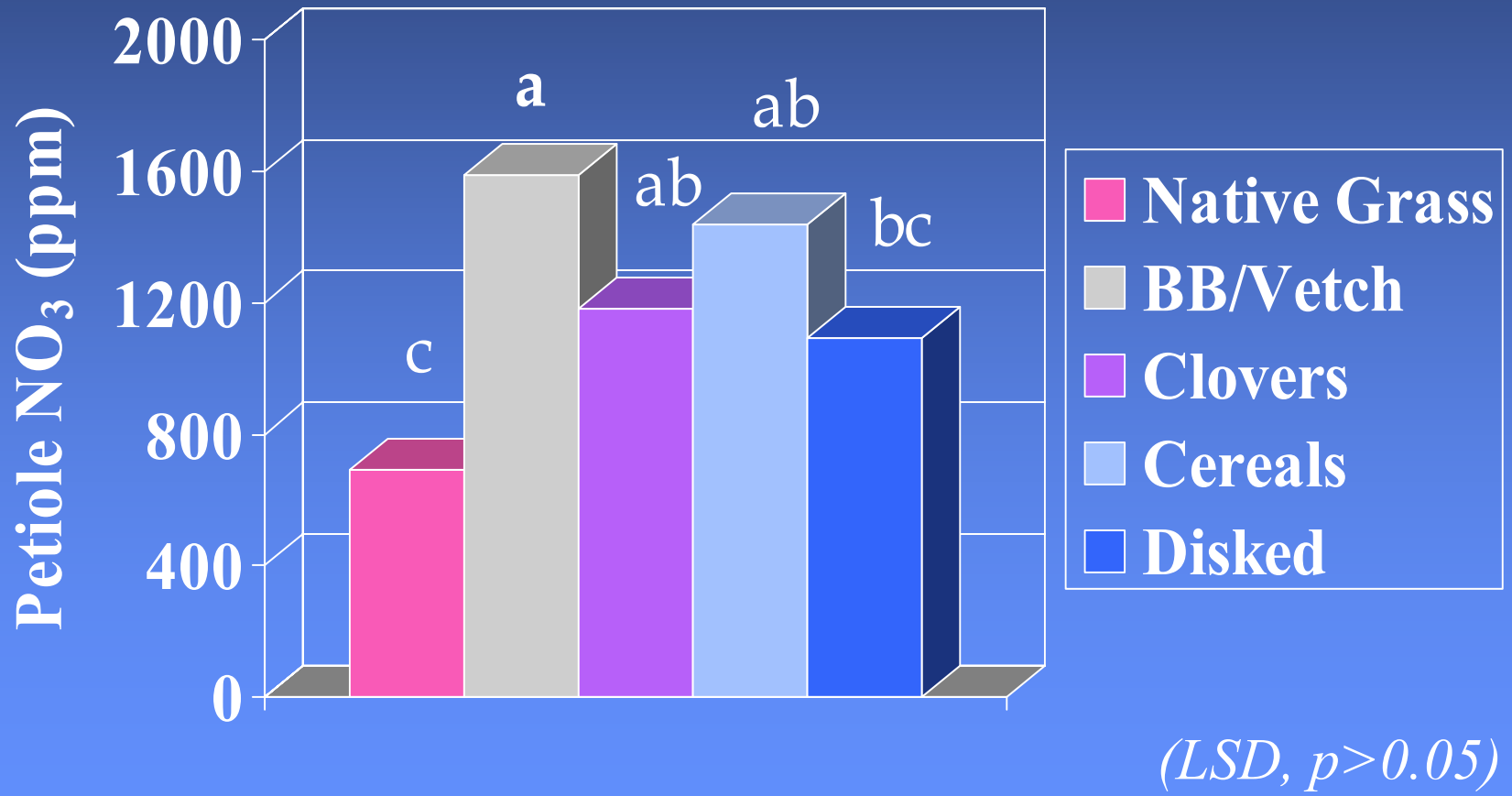
Are Cover Crops Sustainable?

It depends:

- Source of organic N
- Erosion protection
- Water penetration
- Vigor management, wine quality
- Do benefits outweigh costs?
- Resident vegetation may be as good

Veraison Petiole Nitrate

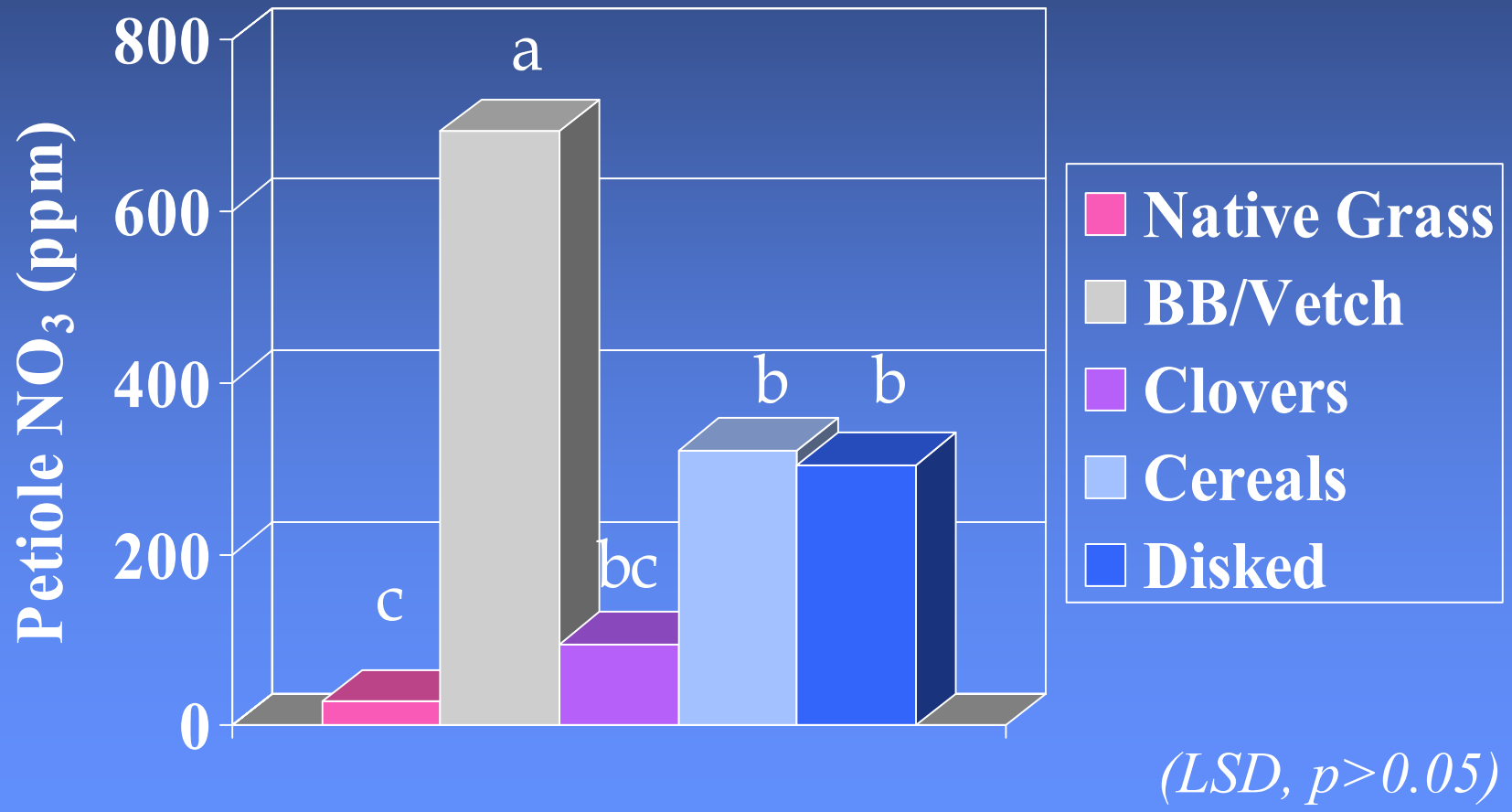
1998



(LSD, p>0.05)

Bloom Petiole Nitrate

2001 (Post Experiment)



(LSD, p>0.05)

Approximate Cover Crop Costs
(Yr. 1 and Yr. 2+)

	Disk		Plant		Mow/Chop	Fert.
Nat Gr	2	0	Y	N	2	Y
BB/Vet	6	6	Y	Y	1	N
Clover	2	0	Y	N	3	N
Cereal	6	6	Y	Y	2	Y
Disked	5	5	N	N	1	N
Res Veg	0	0	N	N	3	N