

# Nutrient and Sediment Losses from Over-wintering Areas in Grazing Systems in Wisconsin



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# Introduction

- ⊙ Recent trends in Wisconsin's dairy industry
  - ⊙ Number of dairy farms decreasing
  - ⊙ Increasing herd sizes
- ⊙ Continuing popularity of managed intensive rotational grazing (MIRG) operations – 15% of the state's dairy farms





# Over-wintering

MIRG operations have adopted the practice of over-wintering their animals in relatively small, outside areas.

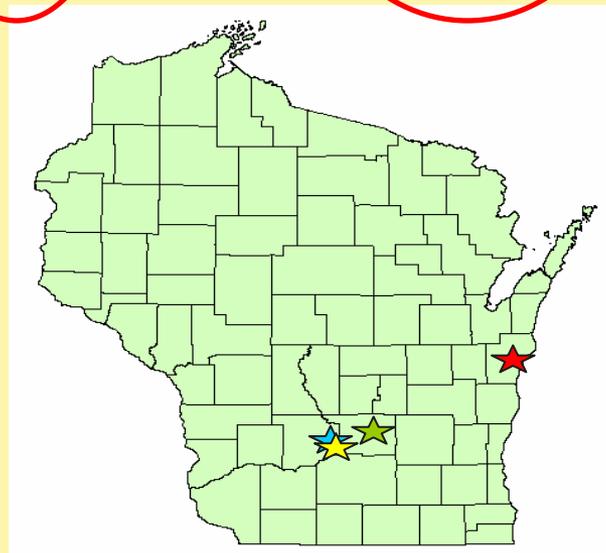
The surface water quality impacts of MIRG are not well understood, particularly those impacts originating from **over-wintering** areas





# Monitored Over-wintering Areas

Farm	Slope	Over-wintering Area (ac)	Over-wintering Density (cows/ac)	Soil Texture
★ C1	5%	29	2.5	Coarse
★ C2	5%	2	4.5	Coarse
★ C3	5%	3.3	8.8	Coarse
★ E1	7%	16	27	Fine



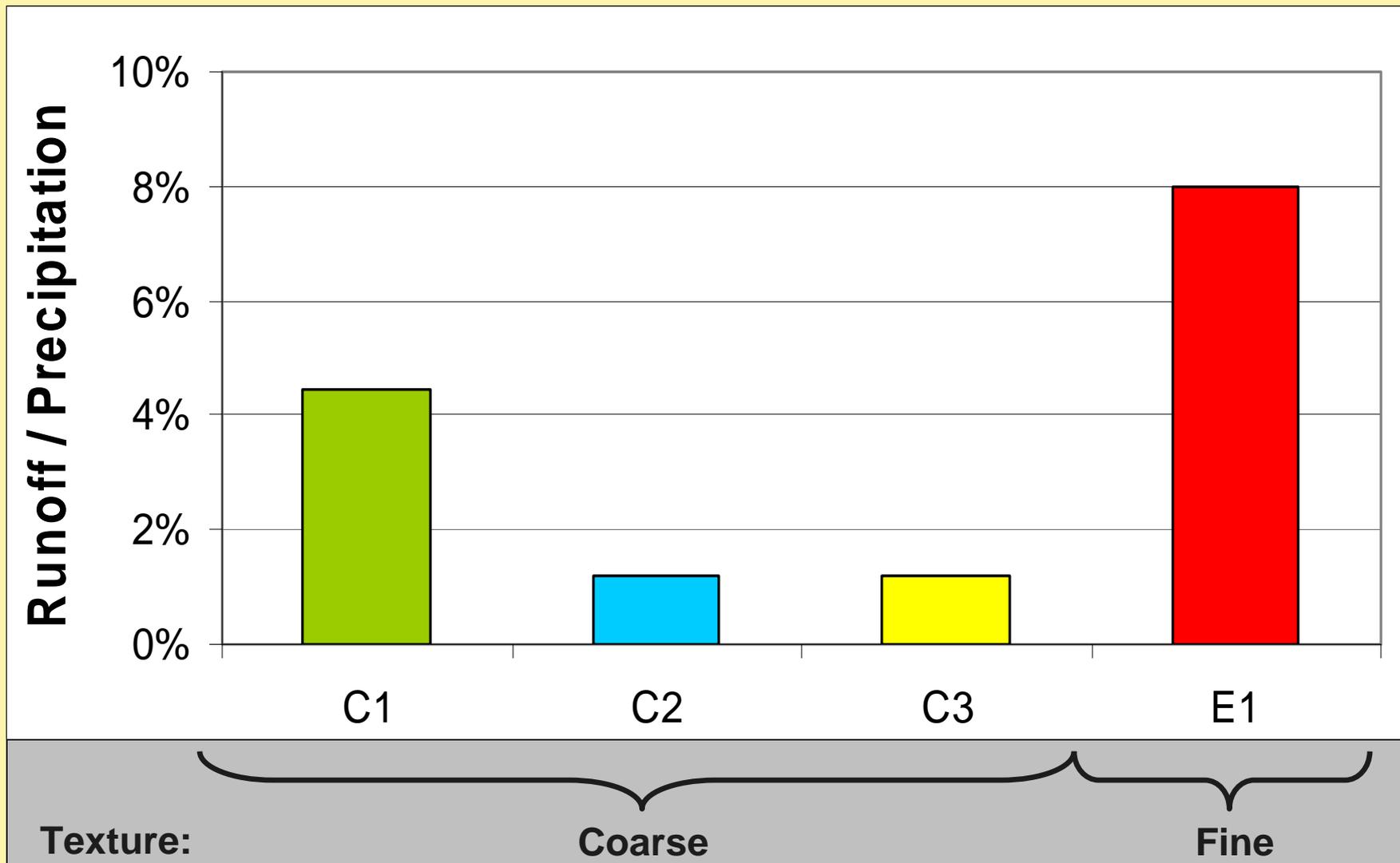


# Instrumentation



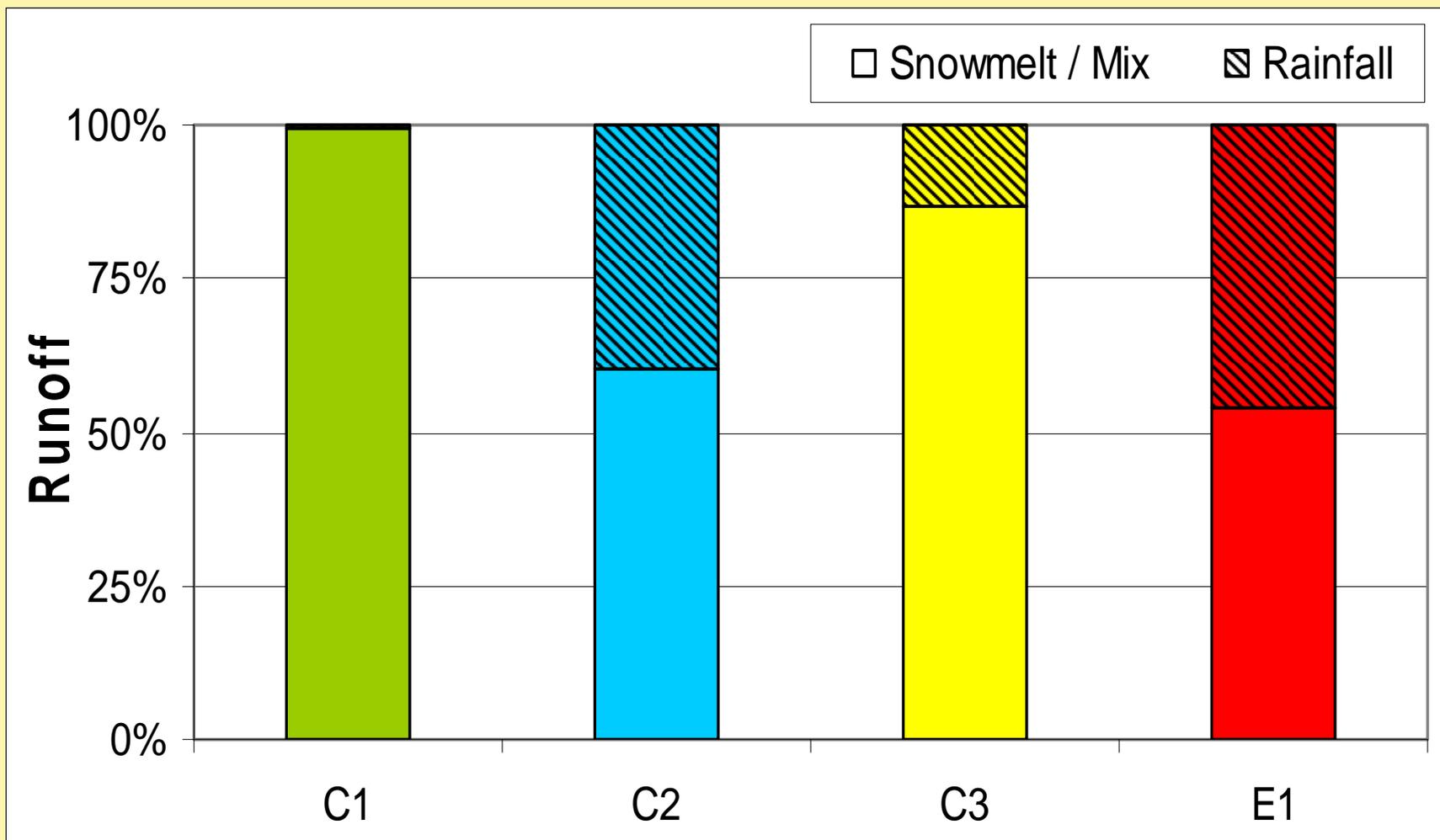


# Surface Runoff Quantity



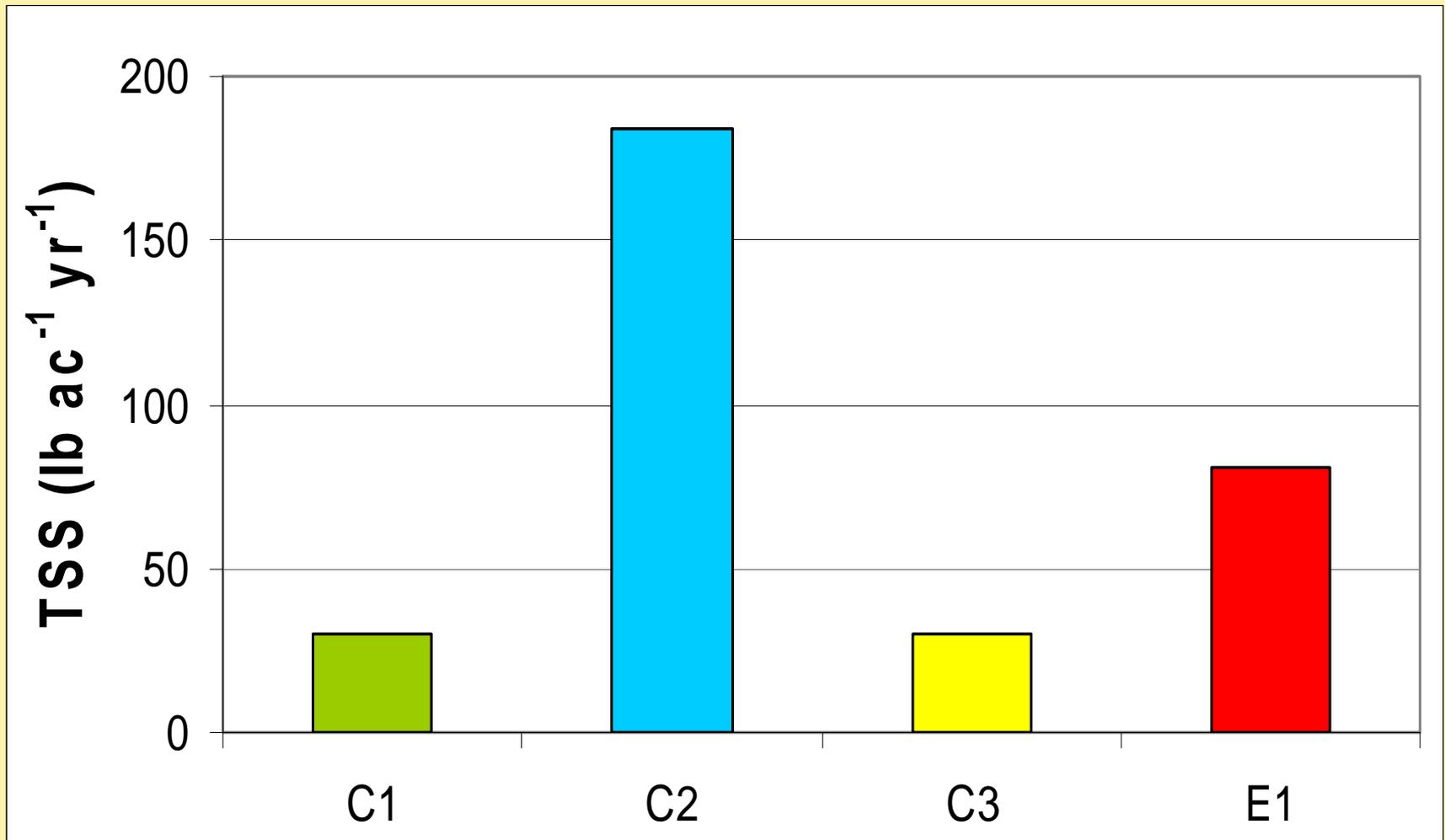


# Surface Runoff Quantity



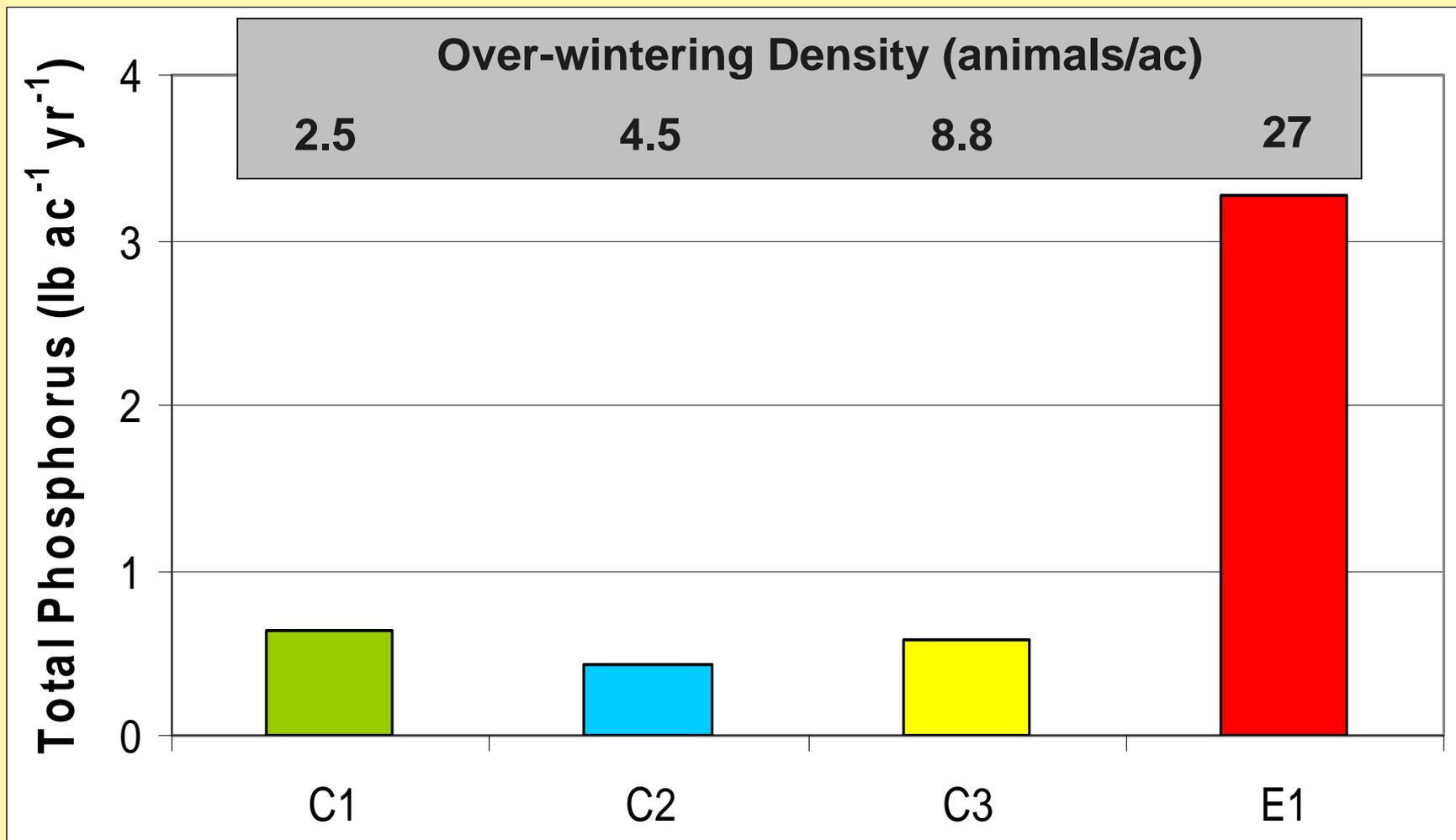


# Surface Runoff Quality



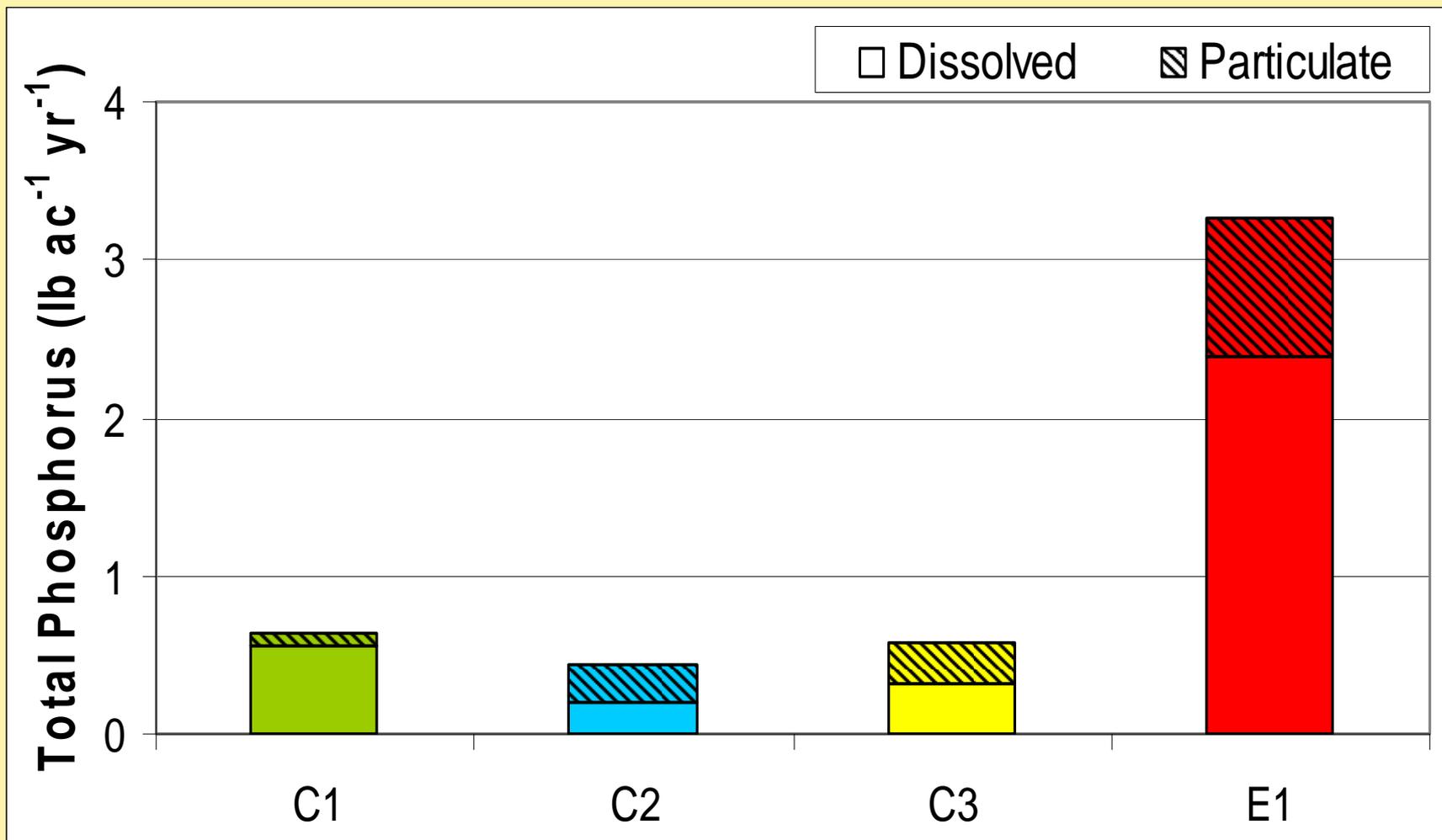


# Surface Runoff Quality





# Surface Runoff Quality





# Conclusions

- ◎ Differences in surface runoff quantity and quality
  - ◎ Soil texture
  - ◎ Animal density
  
- ◎ Importance of snowmelt periods
  
- ◎ Recommendation table



# Recommendation Table

## Based on P Application

Assuming:

- ⊙ Manure production
  - ⊙ 106 lb/day/cow
  - ⊙ 3 lb P<sub>2</sub>O<sub>5</sub>/ton manure
  - ⊙ 20 hours in paddock/day
- ⊙ Pasture yield
  - ⊙ 3 ton/acre/yr
  - ⊙ 45 lb P<sub>2</sub>O<sub>5</sub> removal

(Taken from Kevan Klingberg UWDF)

Over-wintering Density (animals/ac)	Number of Days to Reach Target P <sub>2</sub> O <sub>5</sub> Application
1	339
2.5	135
5	67
7.5	45
10	33
15	22
20	16
30	11
50	6
100	3



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