Assessing the Impacts of Mob Grazing in Southern Oregon

WESTERN SARE
Sustainable Agriculture Research & Education

Funded by a grant from the **Western Sustainable Agriculture Research and Education Program**

What is Mob Grazing?

- Ultra-High Density, Short Duration Grazing
  - Generally measured in pounds per acre
  - Often residency periods of 24 hours or less

What is Mob Grazing?

- Focus is on residual rather than consumption
  - Potentially high amounts of forage trampled
    - Trampled forage not considered wasted
    - Keep soil covered and feed soil microbes
  - Long rest periods
    - 90 days to a year or more
- Fewer herds, more paddocks
  - less labor?

Purported Benefits

- Increased organic matter in the soil
  - Increased water infiltration and water holding capacity (increased resilience to drought)
- Healthier soil microbes and greater nutrient availability
  - constant soil cover and feed resources
- Increased forage production and plant density
- Increased carrying capacity
- Increase in variety/number of forage species
  - Increase in natives and perennials


BUT…very little research
AND…varying definitions
05/10/2012

University of Wisconsin Study

- 200 producers asked to define mob grazing
- 40,000 lbs to 2 million lbs live cattle/acre
  - Average was $200,000 pounds per acre
- Most producers defined it as:
  - High stock density
  - Longer rest periods
  - Shorter graze periods
  - Constant moves
  - Forage trampling

Background

Study Structure

- Funded by a grant from the Western Sustainable Agriculture and Education Program
- Professional + Producer Grant
  - Fairly small budgets, specific allowable categories
  - Must be producer driven
  - Minimum of 5 producers + 1 professional
- 3 field-year trial
  - revert to standard winter management in offseason
  - Season ended by first killing frost

Study Structure

- 3 “sites” providing replicates
  - Ashland (Burch and Winters)
  - Eagle Point (Boyer and Jackson)
  - Central Point (Martin)
- Data analyzed within site only
  - No comparison between sites
- Concerned with trends due to management (treatments)

Study Structure

- 3 treatments with 3 randomized replicates per treatment
  - MOB - at least **300,000 pounds** per acre equivalent
  - BAU - variations of MiG
  - Control – varies by site
    - Haying followed by continuous grazing (Boyer/McCullough)
    - Total exclusion/no grazing (Martin)
    - Frequent grazings; shipping/gathering field (Burch/Winters)

Central Point - Martin

- Sandy loam soil
- Flat
- Flood irrigated
- Grazed with cattle
- Historically managed with management-intensive grazing (MiG)
- Area previously planted in warm-season Eastern Gamagrass
- Control is total exclusion

Ashland - Burch/Winters

- Clay soils
- Southern exposure hillside
- Sprinkler irrigated
- Grazed with cattle
- Historically managed with MiG trending towards mob grazing
- Control is shipping pasture (frequent grazings with no particular schedule)

Eagle Point – Boyer/Jackson

- Heavy clay soils
- Mostly flat, trending north
- Flood irrigated
- Grazed with sheep, control with cattle
- Historically managed with MiG
- Control is hayed 1st cutting, then continuously grazed

Parameters - Soil

- To characterize site:
  - Soil type
  - Historical Use
  - Climate/weather
  - Aspect and slope
  - Irrigation type and frequency
  - Type of livestock
  - Fertilization and worming practices

Parameters - Soil

- Baseline (Beginning and end of study)
  - pH
  - Quick Hydrometer (soil texture)
  - CEC (ability to hold and exchange cations)
  - Mehlich 3 (P, K, Ca, Mg, Na and micronutrients)
  - Walkley-Black OM
  - Total CN
  - C:N Ratio
  - Bulk density (indicator of soil compaction)

Parameters – Soil

- Baseline, con't
  - Aggregate stability
  - Infiltration rate
  - Soil microbes (Total/Active Fungi and Bacteria)

Parameters - Soil

- Beginning and End of Season
  - Soil cover (percentage)
  - Soil Health (Haney lab)
- 48 hours post irrigation (each cycle)
  - Soil moisture (volumetric water content, water volume:soil volume)
  - Soil Temperature

Parameters – Forage

- Beginning and End of Season
  - Species composition
- Every Grazing
  - Production

Specific Tests

Haney Soil Health

- Focuses on NPK and how soil microbes affect those elements
- Uses soil extracts that occur naturally in the soil
- Attempt to make fertilization more effective
- Also measure microbial food
- Standard lab analyses accounts for ~1/2 of N in soil, but plants can access IO and O N from soil OM
- Uses a variety of tests, combines the results

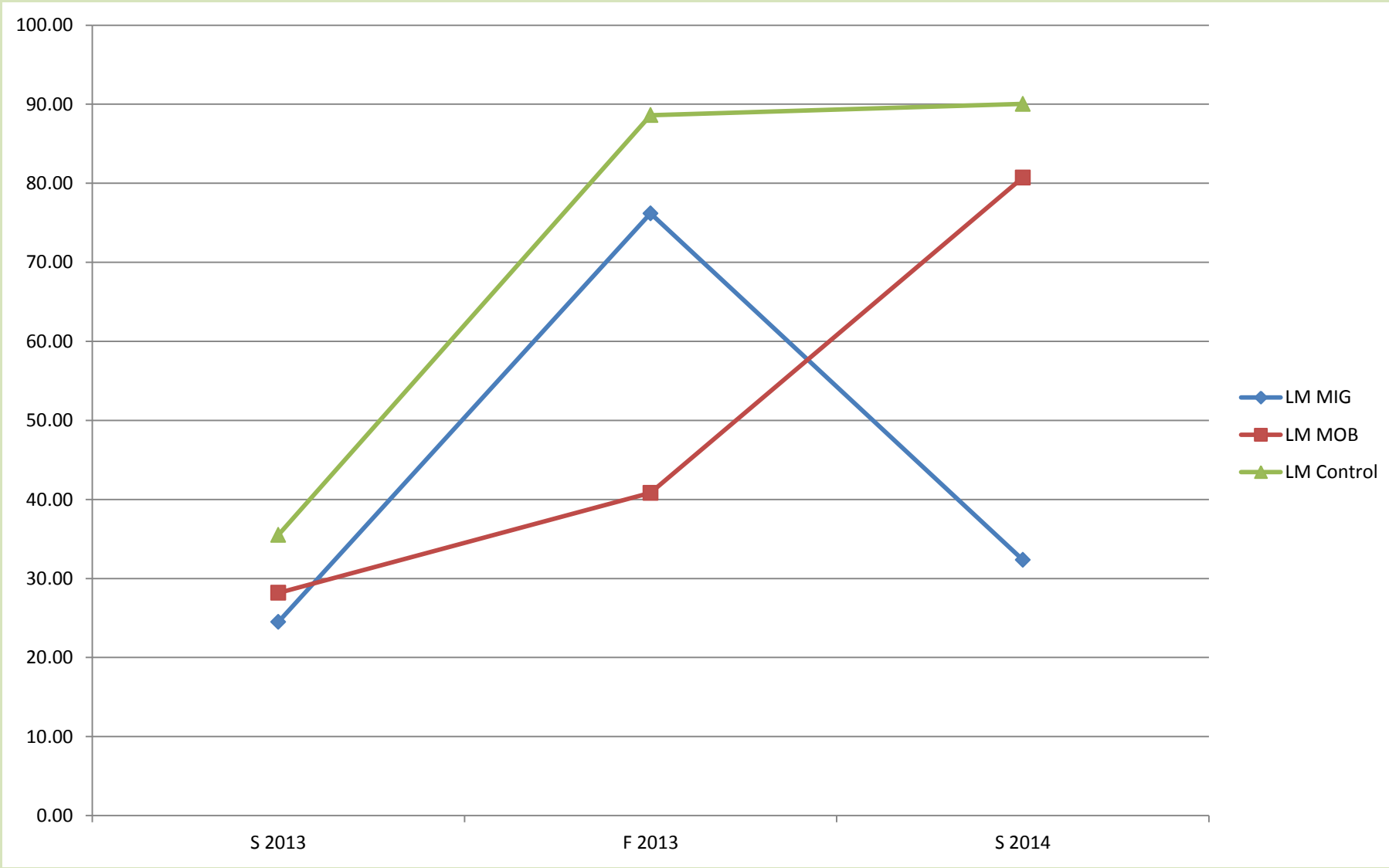
Haney Soil Health

- Nitrogen – uses 9 tests/ratios
- P – 7 different extractants, 9 tests/ratios
- Tool combines
  - Solvita (soil respiration)
  - Water soluble organic C
  - Water soluble organic N
  - Organic C:N ratio (Balance)
- Provides a single health score and a cover crop suggestion to balance the soil (if applicable)

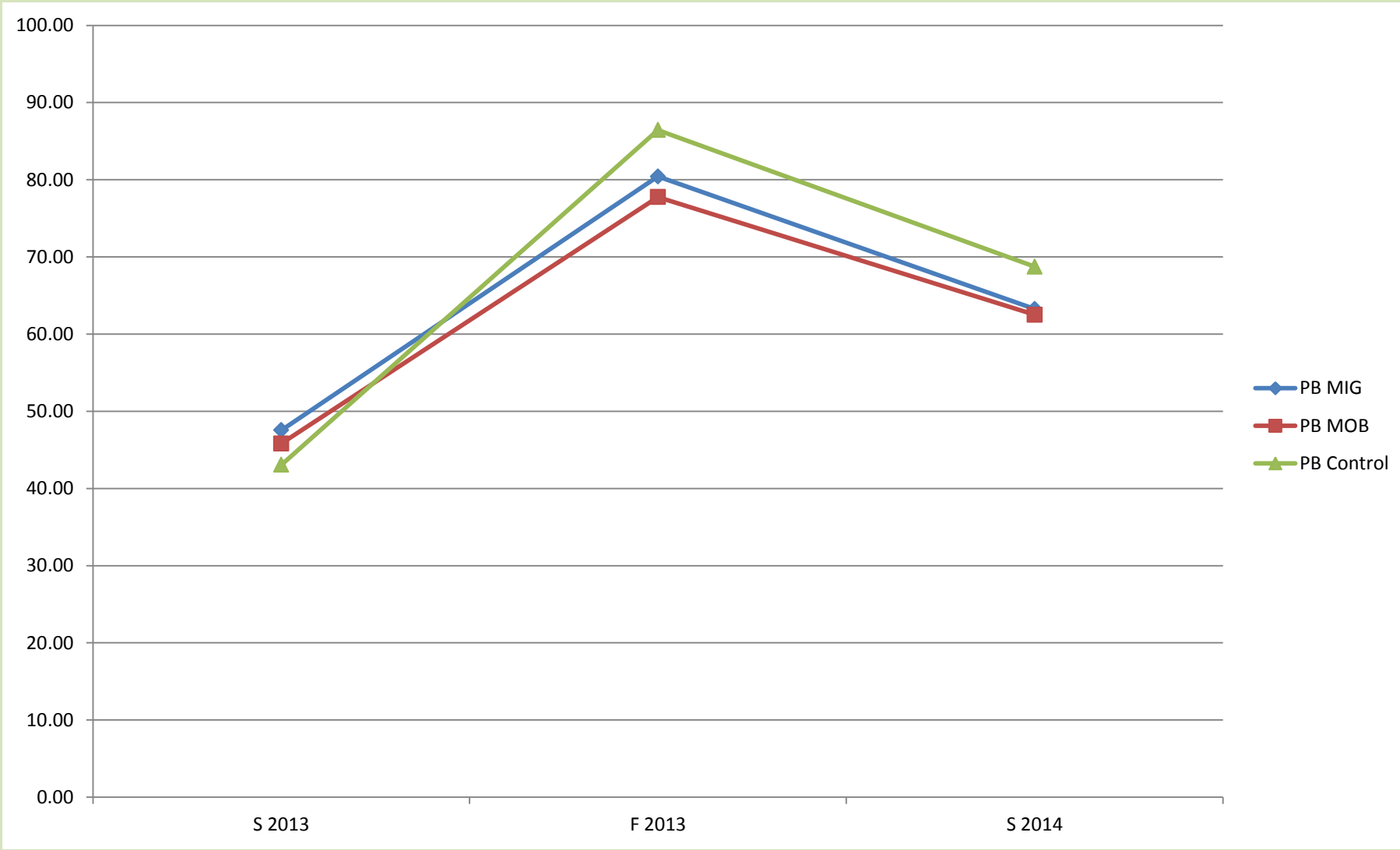
Haney Soil Health

- Combines biological and chemical properties
- A picture of overall soil health
- Tracks effect of management over time
- Not comparable region to region
- Scores above 7 considered good
  - 7 is average across the country
  - Average fertilizer savings is $27/acre
- Soils with same OM can have different N and P mineralization; therefore different score

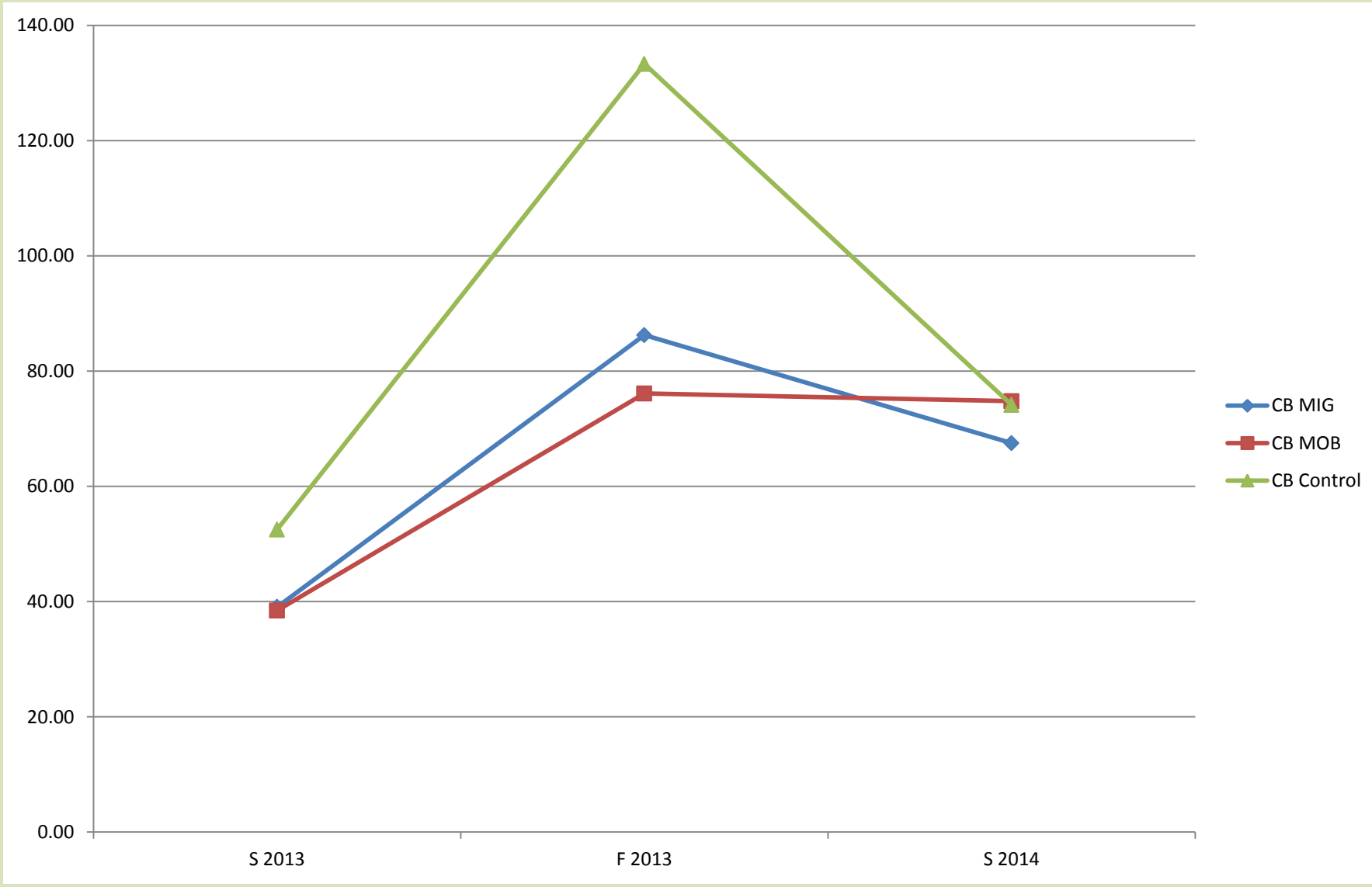
Martin Soil Health Results



Burch Soil Health Results



Boyer Soil Health Results



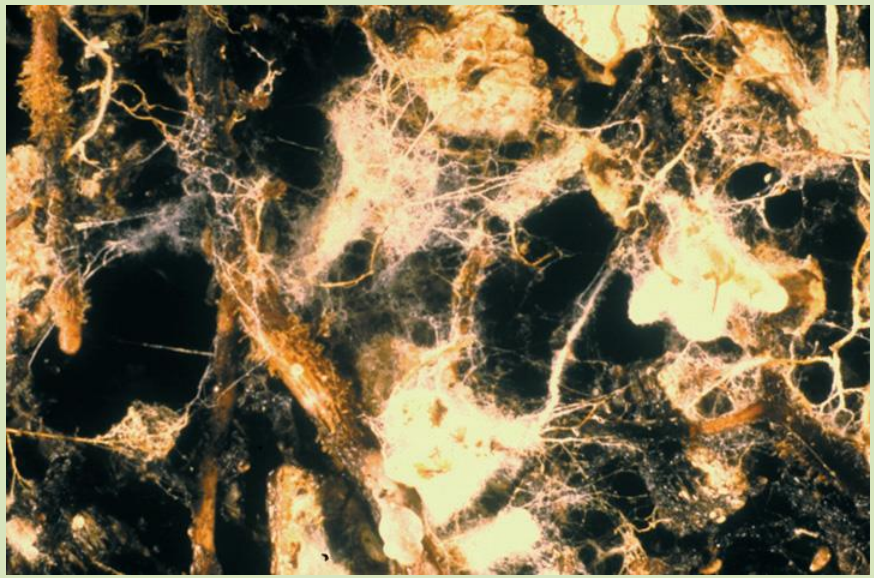
Earthfort Testing

- Total bacteria indicates abundance of food for predators, nutrient cycling capacity, and general diversity
- Active bacteria is component of total biomass that is currently metabolizing oxygen (functional fraction)

Earthfort Testing

- Total fungi indicates nutrient retention, soil structure and relationship to pH
- Fungal hyphae diameter helps determine fungal population diversity and whether beneficial
  - Diameters greater than 2.5 ideal
- B:F ratio indicates

stage of succession

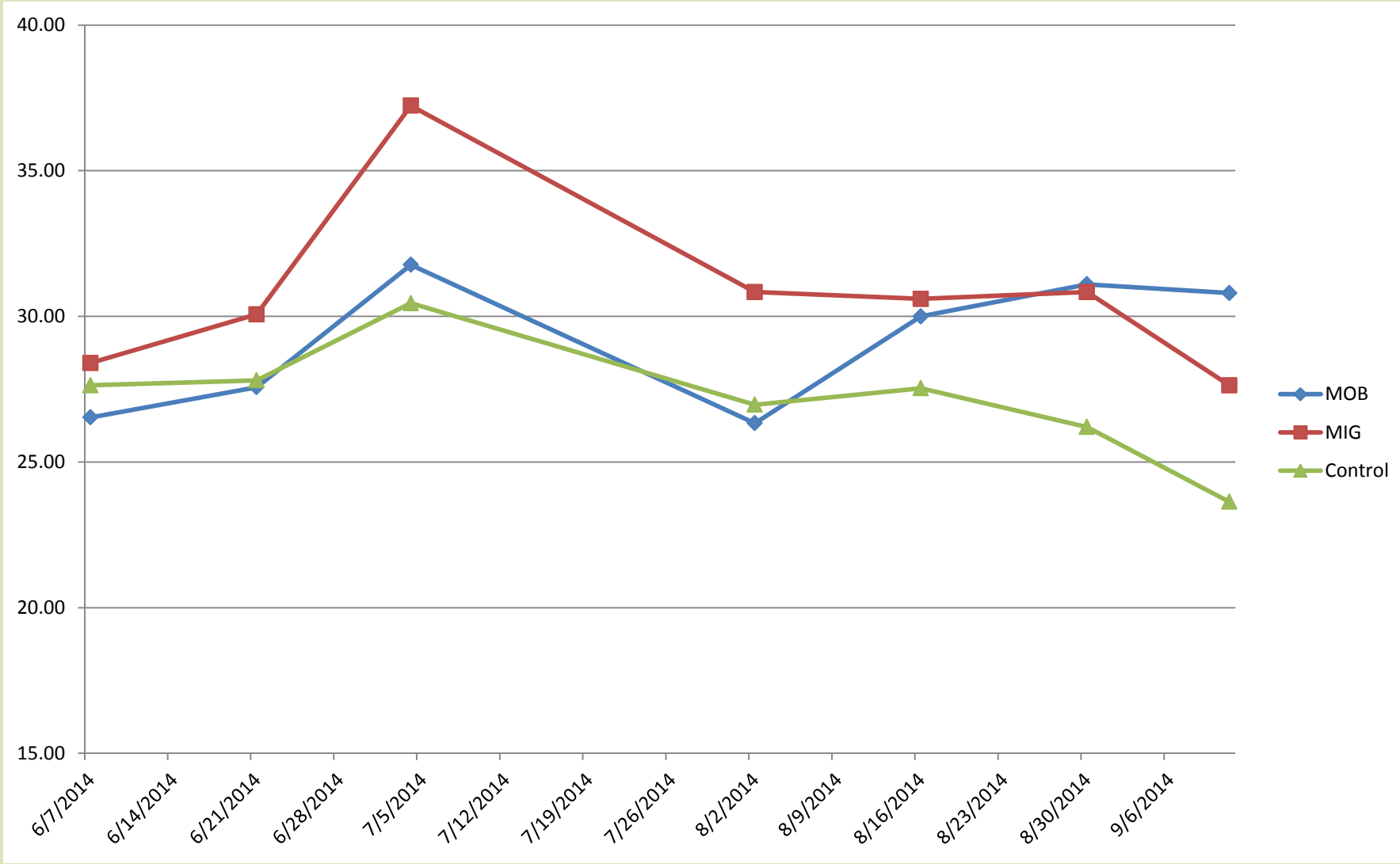


Baseline Earthfort Results

Unique ID	AB	TB	AF	TF	DIA	TF:TB	AF:TF	AB:TB	AF:AB
CB-B1	41.28	1484.00	48.98	717.28	2.90	0.48	0.07	0.03	1.19
CB-B2	61.90	2016.00	40.12	966.41	2.90	0.48	0.04	0.03	0.65
CB-B3	46.10	1632.00	10.06	677.01	2.85	0.41	0.01	0.03	0.22
AVE	49.76	1710.67	33.06	786.90	2.88	0.46	0.04	0.03	0.68
CB-X-1	131.62	743.00	19.28	1012.83	2.85	1.36	0.02	0.18	0.15
CB-X-2	109.73	1220.00	34.39	1148.85	2.80	0.94	0.03	0.09	0.31
CB-X-3	135.58	1277.00	29.60	882.75	2.80	0.69	0.03	0.11	0.22
AVE	125.64	1080.00	27.76	1014.81	2.82	1.00	0.03	0.12	0.23

Martin Soil Temperatures

Martin Soil Moisture (%)




Questions?