AGRIMENT SERVICES Inc.
Animal Waste Management Systems

# Milo Silage

Field Study Data Sheet: MILCA04GA

**Location:** Bakersfield, California (Kern Co.) **Date:** June – Nov 2004
**Area Treated:** 4.48 acres **Non-Treated Area:** 3.26 acres
**Product Used:** ASI Phosphate Reduction @ 2 gallons / acre **Applied By:** Broadcast
**Timing of Application:** Preplant and incorporated **ASI Contact:** Geno Kennedy
Sewage sludge applied @ 40 tons per acre to all treatments

**Soil analysis: Preplant soil samples taken 6/3/04**

| Treatment | pH 1:1 paste | Cond. mS/cm | CEC me/100g | Organic matter % | N ppm | P ppm | Ca ppm | Mg ppm | K ppm | Na ppm | S ppm |
|---|---|---|---|---|---|---|---|---|---|---|---|
| ASI Phosphate Reduction | 7.7 | 1.65 | 26.89 | 1.66 | 27 | 279 | 3471 | 314 | 121 | 1291 | 566 |
| Control | 7.8 | 1.05 | 25.29 | 1.29 | 23 | 271 | 3483 | 293 | 116 | 972 | 400 |

| | % Base Saturation | | | | | Trace Elements (ppm) | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Treatment | Ca | Mg | K | Na | Other | B | Fe | Mn | Cu | Zn | Al |
| ASI Phosphate Reduction | 64.54 | 9.73 | 1.15 | 20.87 | 3.70 | 2.22 | 96 | 56 | 11.16 | 19.58 | 639 |
| Control | 68.86 | 9.65 | 1.18 | 16.71 | 3.60 | 1.71 | 104 | 56 | 11.43 | 22.67 | 778 |

**Soil analysis: Post harvest soil samples taken 11/10/04**

| Treatment | pH 1:1 paste | Cond. mS/cm | CEC me/100g | Organic matter % | N ppm | P ppm | Ca ppm | Mg ppm | K ppm | Na ppm | S ppm |
|---|---|---|---|---|---|---|---|---|---|---|---|
| ASI Phosphate Reduction | 7.5 | 1.65 | 31.56 | 1.94 | 30 | 325 | 4570 | 396 | 131 | 885 | 624 |
| Control | 7.6 | 1.32 | 27.76 | 1.97 | 30 | 343 | 4129 | 343 | 112 | 671 | 407 |

| | % Base Saturation | | | | | Trace Elements (ppm) | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Treatment | Ca | Mg | K | Na | Other | B | Fe | Mn | Cu | Zn | Al |
| ASI Phosphate Reduction | 72.40 | 10.46 | 1.06 | 12.19 | 3.90 | 2.48 | 142 | 51 | 14.44 | 25.08 | 766 |
| Control | 74.37 | 10.30 | 1.03 | 10.51 | 3.80 | 1.96 | 172 | 54 | 14.00 | 22.88 | 799 |

**Feed Analysis:**

| | % as received | | Dry weight basis | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Treatment | Moisture content % | Dry matter % | Crude protein % | Digest protein % | Fiber % | TDN % | ENE Mcal /100lb | NE grain Mcal /lb | NE lact Mcal /lb | Digest energy Mcal /lb | NDF % | ADF % |
| ASI Phosphate Reduction1 | 74.88 | 25.12 | 11.64 | 8.03 | 26.14 | 68.54 | 52.33 | 0.42 | 0.71 | 1.37 | 49.00 | 30.10 |
| ASI Phosphate Reduction2 | 75.04 | 24.96 | 11.81 | 8.15 | 26.43 | 68.22 | 51.83 | 0.42 | 0.71 | 1.36 | 49.20 | 30.50 |
| ControlTruck 20 | 72.20 | 27.80 | 13.67 | 9.43 | 26.20 | 68.47 | 52.22 | 0.42 | 0.71 | 1.37 | 49.82 | 30.19 |

**Feed Analysis:**

| | Dry weight basis | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Treatment | N % | P % | K % | Ca % | Mg % | Na % | S % | Fe ppm | Mn ppm | Cu ppm | Zn ppm |
| ASI Phosphate Reduction1 | 1.86 | 0.251 | 1.534 | 0.444 | 0.323 | 0.050 | -- | 319.7 | 32.3 | 10.3 | 61.0 |
| ASI Phosphate Reduction2 | 1.89 | 0.238 | 1.453 | 0.350 | 0.292 | 0.027 | -- | 319.9 | 31.0 | 7.3 | 55.3 |
| Control Truck 20 | 2.19 | 0.241 | 1.395 | 0.332 | 0.252 | 0.020 | -- | 295.8 | 35.1 | 6.2 | 46.5 |

**Interpreting silage analysis**:
Silage moisture should be between 60 – 70%.
Crude protein includes true protein and non-protein but no information about digestibility.
ADF is acid detergent fiber consists primarily of cellulose, lignin and acid detergent fiber crude protein. Lower ADF values indicate better digestibility.
NDF is neutral detergent fiber contains cellulose, hemicellulose and lignin. Lower NDF means higher feed intake.
TDN is total digestible nutrients which represents the sum of digestible crude protein, digestible carbohydrates and digestible fat.
ENE is the estimated net energy for weight gain and milk production.
NE lactation is the net energy requirements for lactating cows.
NE grain is net energy value for increasing body tissue, growth or weight gain.

**Silage yield and nutrients extracted from soil and biosolids:**

| Treatment | Fresh Yield tons/acre | Dry Yield lbs/acre | Total pounds per acre of nutrients removed at harvest in the dry milo silage | | | | | | | | | | Income $25/ton/ac adjusted |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | N | P | K | Ca | Mg | Na | Fe | Mn | Cu | Zn | |
| ASI Phosphate Reduction 4.48 acres | 6.27 | 3143.9 | 59 | 8 | 47 | 13 | 10 | 1 | 1 | 0.10 | .028 | 0.2 | $142.33 |
| Control 3.26 acres | 4.22 | 2345.1 | 51 | 6 | 33 | 8 | 6 | 0.5 | 0.7 | 0.08 | .015 | 0.1 | $99.36 |

**Comments:**

- Higher salt content in ASI Phosphate Reduction than control treatment yet ASI Phosphate Reduction gave a greater percent reduction in sodium than the control
- Greater increases in soil concentrations of S, K, Mg, Ca, and Zn due to ASI Phosphate Reduction
- Higher K, Ca, Mg, Na, Fe, Cu and Zn concentrations in the silage from the ASI Phosphate Reduction treatment
- One-third greater fresh yield and dry yield per acre with ASI Phosphate Reduction Greater utilization of nutrients from the biosolids with ASI Phosphate Reduction
- Greater income per acre generated with ASI Phosphate Reduction Overall advantage of ASI Phosphate Reduction is improvement of soil conditions and crop utilization of applied nutrients
- Higher adjusted income per acre with the ASI Phosphate Reduction treatment