

## Moisture Temperature Response Surface Appendix A

Table 1: Moisture Temperature Response Surface Matrix					
	Moisture 1	Moisture 2	Moisture 3	Moisture 4	Moisture 5
Temperature 1	T1M1	T1M2	T1M3	T1M4	T1M5
Temperature 2	T2M1	T2M2	T2M3	T2M4	T2M5
Temperature 3	T3M1	T3M2	T3M3	T3M4	T3M5
Temperature 4	T4M1	T4M2	T4M3	T4M4	T4M5
Temperature 5	T5M1	T5M2	T5M3	T5M4	T5M5

Table 2: MTRS Incubation Organization						
Incubation #1						
	Moisture 1	Moisture 2	Moisture 3	Moisture 4	Moisture 5	
Temperature 1	T1M1		T1M3		T1M5	
Temperature 2		T2M2		T2M4		
Temperature 3	T3M1		T3M3		T3M5	
Temperature 4		T4M2		T4M4		Control1
Temperature 5	T5M1		T5M3		T5M5	
Incubation #2						
	Moisture 1	Moisture 2	Moisture 3	Moisture 4	Moisture 5	
Temperature 1		T1M2		T1M4		
Temperature 2	T2M1		T2M3		T2M5	
Temperature 3		T3M2		T3M4		Control2
Temperature 4	T4M1		T4M3		T4M5	
Temperature 5		T5M2		T5M4		Control3

Table 3: Suggested Incubation Schedule							
Day:	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday	Sunday
Task:	Finish incubation/ clean up	Measure gravimetrics	Air-dry soil if necessary	Pre-incubate	Incubate	Incubate	Incubate

Table 4: Calculating VWC Moisture Levels				
Sevilletta B VWC Levels				
VWC Quantile	VWC	Moisture Level	VWC Increase per moisture level	VWC
97.5%	0.26677	Level 5	= (Level 5 -Level 1) /4	0.26677
		Level 4		0.21878
		Level 3		0.17079
		Level 2		0.12279
2.5%	0.0748	Level 1		0.0748

Table 5: Determining Gravimetric Water Content from Volumetric Water Content				
Sevilleta B- VWC and GWC Equation	VWC (x values)	Plug it in	GWC (y values)	Moisture Level
$y = 0.3123x - 0.0004$	0.26677	$y = 0.3123(0.26677) - 0.0004$	0.08291	Level 5
	0.21878	$y = 0.3123(0.21878) - 0.0004$	0.06792	Level 4
	0.17079	$y = 0.3123(0.17179) - 0.0004$	0.05325	Level 3
	0.1225	$y = 0.3123(0.1225) - 0.0004$	0.03795	Level 2
	0.0748	$y = 0.3123(0.0748) - 0.0004$	0.02296	Level 1

See Excel for Table 6

Table 7: Calculating Flow Rate with the Flow Meter			
Scale Reading	Flow Rate (mL/min)	Desired Volume (L)	Duration of time to fill volume
70	10252	75	$(75 \text{ L}) / [(10252 \text{ mL/min}) \times (1 \text{ min}/ 60 \text{ sec}) \times (1 \text{ L}/ 1000\text{mL})] = 439 \text{ sec}$

Table 8: Incubation Length and Cycle Time Calculation	
Total Incubation Time	38 hours
Number of Cycles	5 Cycles
Cycle time	$[38 \text{ hr} \times (60 \text{ mins/hr}) \times (60 \text{ sec/min})] / 5 \text{ cycles} = 27360 \text{ sec/cycle}$
Open split stall time	$27360 \text{ sec/cycle} - [(29 \text{ MCIA}_\text{ measurements/cycle}) \times (400 \text{ sec/measurement})] = 15760 \text{ sec}$