

FINAL REPORT

EFFECTS OF STORAGE ON *SERICEA LESPEDEZA* BIOMASS FOR
BIOMASS-TO-ETHANOL AND THERMOCHEMICAL PROJECTS

NREL Subcontract No. HW-1-11176-1

Submitted by

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to

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INTRODUCTION

Since data analysis was not required in this subcontract the narrative section of this report is brief and mainly concerns explanations of the data delivered and any deviations from the statement of work.

Apart from a few minor deviations, the work plan (statement of work) was followed closely for the entire duration of this project. Sampling dates varied slightly from schedule because sampling was influenced by weather conditions. The additional bales (12 instead of 8) requested in the contract modification were not obtained because insufficient area was reserved for the second harvest to obtain the yield required for 4 extra bales. This was because the modification was made after the supplier of the sericea had harvested his sericea fields for seed. However, all other details (alterations in the sampling procedure) specified in the modification were followed.

EXPLANATION OF DATA ACCORDING TO STATEMENT OF WORK (SOW) AND DELIVERABLES (DS)

The first section of the data file (pages 1-9; numbers in top right corner of page) is a calendar of research activities for the subcontract.

1. Sericea harvest and baling: (SOW item A and F)

Sericea was harvested on October 6 and December 16, 1992. This provided 10 and 9 bales in the first and second harvest, respectively. Details of the feedstock biomass and production conditions appear below according to SOW item F.

1. Taxonomy: Lespedeza cuneata, variety Serala

2. Age of stand: greater than 10 years
3. Feedstock density in field: good
4. Biomass yield: first harvest - 6.2 Mg ha^{-1}
second harvest - 5.0 Mg ha^{-1}
5. Sources of stress: this field was sprayed with 2,4 D to control weeds and had received no fertilizer in 3 years.
6. Crop health: despite low fertility, the crop was healthy.
7. Rainfall: April, 9.0 cm; May, 12.6 cm; June 13.9 cm; July, 6.0 cm;
August, 10.4 cm; September, 4.8 cm; October, 0.9 cm;
November, 13.4 cm
8. Soil type: Piedmont clay
9. Leaf:stem ratio: first harvest - 21% leaf, 79% stem
second harvest - 0% leaf, 100% stem

2. Samples delivered: (SOW item B; DS item A)

Samples were delivered to NREL close to the scheduled dates. See calendar of research activities (pages 1-9).

3. Bale environmental variables: (SOW item C; DS item B)

Bale environmental variables are presented in the data file as listed below.

<u>Variable(s)</u>	<u>Pages</u>
a. Percent Moisture	10-13
b. Density	14-17
c. Mass Loss	18-21
d. Bale and Air Temperature	22-27

4. Weather data: (SOW item D; DS item C)

<u>Variable(s)</u>	<u>Pages</u>
a. Monthly rainfall	28
b. Mean daily air temperature and relative humidity	29-34

5. Quality assessment: (DS item D)

No quality assessment procedures were negotiated with the subcontractor.

6. Photographic documentation: (SOW item E, DS item E)

Slides of the various research activities are stored in the slide holders at the back of the data files.

OTHER COMMENTS

Variation in density estimates appeared to be primarily a function of sampling variation, even though we increased the sample size from that recommended by NREL in the statement of work (2 g) to 20-30 g. The main cause of density variation in the bales is probably leaf:stem ratio and thickness of stem.

Mold seemed to be a problem mainly in the first harvest bales which contained leaf material. Water entered the bales to a depth of 6-12 inches, but this was highly variable within and among bales, and this was probably partly related to the fact that the outside of the bale seemed to be less densely packed than the inside. This was evident from the difficulty experienced in slicing the bales with the chain saw at different locations and the difficulty experienced with insertion of the thermocouples at different locations. No other visual observation appeared to be important.

Contents

<u>Items</u>	<u>Pages*</u>
1. Calendar of Activities	1-9
2. Moisture	10-13
3. Density	14-17
4. Mass Loss	18-21
5. Bale and Air Temperature	22-27
6. Monthly Rainfall	28
7. Daily Air Temperature and Relative Humidity	29-34
8. Thermocouple Calibration	35-36
9. Duplicate Weights of Moisture Samples	37

* Pages numbered in top right hand corner of Data section

OCTOBER 1991

Sun	Mon	Tues	Wed	Thurs	Fri	Sat
		1	2	3	4	5
6 first harvest cut	7	8 first harvest baled J281 S1-1	9	10	11 thermo- couplers installed J284 S1-4	12 J285 S1-5
13 J286 S1-6	14 J287 S1-7	15 J288 S1-8	16 J289 S1-9	17 J290 S1-10	18 J291 S1-11	19 J292 S1-12
20 J293 S1-13	21 J294 S1-14	22 Dm 1-1 • 200 lbs sent out J295 S1-15	23 J296 S1-16	24 J297 S1-17	25 J298 S1-18	26 J299 S1-19
27 J300 S1-20	28 J301 S1-21	29 J302 S1-22	30 J303 S1-23	31 6 slices 3 Y4 wk Harv. I J304 S1-24		

Dm = Density/moisture sample taken

NOVEMBER 1991						
Sun	Mon	Tues	Wed	Thurs	Fri	Sat
					1 J305 S1-25	2 J306 S1-26
3 J307 S1-27	4 J308 S1-28	5 pm 1-2 J309 S1-29	6 J310 S1-30	7 J311 S1-31	8 J312 S1-32	9 J313 S1-33
10 J314 S1-34	11 J315 S1-35	12 J316 S1-36	13 J317 S1-37	14 J318 S1-38	15 J319 S1-39	16 J320 S1-40
17 J321 S1-41	18 J322 S1-42	19 pm 1-3 J323 S1-43	20 J324 S1-44	21 J325 S1-45	22 6:51:45 6 1/2 w/w Hari-1 J326 S1-46	23 J327 S1-47
24 J328 S1-48	25 J329 S1-49	26 J330 S1-50	27 J331 S1-51	28 J332 S1-52	29 J333 S1-53	30 J334 S1-54

M

DECEMBER 1991

Sun	Mon	Tues	Wed	Thurs	Fri	Sat
1 J335 S1-55	2 J336 S1-56	3 pm 1-4 J337 S1-57	4 J338 S1-58	5 J339 S1-59	6 J340 S1-60	7 J341 S1-61
8 J342 S1-62	9 J343 S1-63	10 J344 S1-64	11 J345 S1-65	12 J346 S1-66	13 J347 S1-67	14 J348 S1-68
15 J349 S1-69	16 <i>Second harvest cut</i> J350 S1-70	17 pm 1-5 J351 S1-71	18 J352 S1-72	19 J353 S1-73	20 <i>2nd harvest baled</i> pm 2-0 <i>200 bushels sent out</i> J354 S1-74 2-1	21 J355 S1-75 2-2
22 J356 S1-76 2-3	23 J357 S1-77 2-4	24 J358 S1-78 2-5	25 J359 S1-79 2-6	26 J360 S1-80 2-7	27 J361 S1-81 2-8	28 J362 S1-82 2-9
29 J363 S1-83 2-10	30 J364 S1-84 2-11	31 J365 S1-85 2-12				

JANUARY 1992

Sun	Mon	Tues	Wed	Thurs	Fri	Sat
			1 J1 S1-86 2-13	2 J2 S1-87 2-14	3 pm 2-1 J3 S1-88 2-15	4 J4 S1-89 2-16
5 J5 S1-90 2-17	6 J6 S1-91 2-18	7 6 slices 3 1/4 wk Hard. 1 J7 S1-92 2-19	8 J8 S1-93 2-20	9 J9 S1-94 2-21	10 J10 S1-95 2-22	11 J11 S1-96 2-23
12 J12 S1-97 2-24	13 6 slices 3 1/4 wk Hard. 2 J13 S1-98 2-25	14 pm 1-4 J14 S1-99 2-26	15 J15 S1-100 2-27	16 J16 S1-101 2-28	17 pm 2-2 J17 S1-102 2-29	18 J18 S1-103 2-30
19 J19 S1-104 2-31	20 J20 S1-105 2-32	21 J21 S1-106 2-33	22 J22 S1-107 2-34	23 J23 S1-108 2-35	24 J24 S1-109 2-36	25 J25 S1-110 2-37
26 J26 S1-111 2-38	27 J27 S1-112 2-39	28 J28 S1-113 2-40	29 J29 S1-114 2-41	30 J30 S1-115 2-42	31 pm 2-3 J31 S1-116 2-43	

FEBRUARY 1992

Sun	Mon	Tues	Wed	Thurs	Fri	Sat
						1 J32 S1-117 2-44
2 J33 S1-118 2-45	3 J34 S1-119 2-46	4 J35 S1-120 2-47	5 6 slices 6 1/2 w/c Hartw. 2 J36 S1-121 2-48	6 J37 S1-122 2-49	7 J38 S1-123 2-50	8 J39 S1-124 2-51
9 J40 S1-125 2-52	10 J41 S1-126 2-53	11 Dm 1-7 J42 S1-127 2-54	12 J43 S1-128 2-55	13 J44 S1-129 2-56	14 Dm 2-4 J45 S1-130 2-57	15 J46 S1-131 2-58
16 J47 S1-132 2-59	17 J48 S1-133 2-60	18 J49 S1-134 2-61	19 J50 S1-135 2-62	20 J51 S1-136 2-63	21 J52 S1-137 2-64	22 J53 S1-138 2-65
23 J54 S1-139 2-66	24 J55 S1-140 2-67	25 J56 S1-141 2-68	26 J57 S1-142 2-69	27 J58 S1-143 2-70	28 Dm 2-5 J59 S1-144 2-71	29 J60 S1-145 2-72

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MARCH 1992						
Sun	Mon	Tues	Wed	Thurs	Fri	Sat
1 J61 S1-146 2-73	2 J62 S1-147 2-74	3 J63 S1-148 2-75	4 J64 S1-149 2-76	5 J65 S1-150 2-77	6 J66 S1-151 2-78	7 J67 S1-152 2-79
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15 J75 S1-160 2-87	16 J76 S1-161 2-88	17 J77 S1-162 2-89	18 J78 S1-163 2-90	19 J79 S1-164 2-91	20 <i>blices</i> <i>13 wil</i> <i>Harv. ✓</i> J80 S1-165 2-92	21 J81 S1-166 2-93
22 J82 S1-167 2-94	23 J83, S1-168 2-95	24 J84 S1-169 2-96	25 J85 S1-170 2-97	26 J86 S1-171 2-98	27 pm 2-6 J87 S1-172 2-99	28 J88 S1-173 2-100
29 J89 S1-174 2-101	30 J90 S1-175 2-102	31 J91 S1-176 2-103				

APRIL 1992

Sun	Mon	Tues	Wed	Thurs	Fri	Sat
			1 J92 S1-177 2-104	2 J93 S1-178 2-105	3 J94 S1-179 2-106	4 J95 S1-180 2-107
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12 J103 S2-115	13 J104 S2-116	14 J105 S2-117	15 J106 S2-118	16 J107 S2-119	17 J108 S2-120	18 J109 S2-121
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MAY 1992						
Sun	Mon	Tues	Wed	Thurs	Fri	Sat
					1 J122 S2-134	2 J123 S2-135
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10 J131 S2-143	11 J132 S2-144	12 J133 S2-145	13 J134 S2-146	14 J135 S2-147	15 J136 S2-148	16 J137 S2-149
17 J138 S2-150	18 J139 S2-151	19 J140 S2-152	20 J141 S2-153	21 J142 S2-154	22 V 2-8 J143 S2-155	23 J144 S2-156
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JUNE 1992						
Sun	Mon	Tues	Wed	Thurs	Fri	Sat
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7 J159 S2-171	8 J160 S2-172	9 J161 S2-173	10 J162 S2-174	11 J163 S2-175	12 J164 S2-176	13 J165 S2-177
14 J166 S2-178	15 J167 S2-179	16 J168 S2-180	17 J169 S2-181	18 J170 S2-182	19 DMZ-9 end Hard 2 exp ← J171 S2-183	20 6 slices + 2001b 26 wK
21	22	23	24	25	26	27
28	29	30				

BRANSBY file name: SLPM.wk1 4 pages

YEAR	JDATE	HARV #	SDATE	REP	GWT	DWT	PMOIST
1991	295	1	15	3	23.4	19.9	15.0
1991	295	1	15	4	25.5	22.3	12.5
1991	295	1	15	5	49.8	43.8	12.0
1991	295	1	15	7	39.9	37.2	6.8
1991	295	1	15	8	28.0	25.0	10.7
1991	295	1	15	9	35.3	31.8	9.9
1991	295	1	15	10	14.8	13.1	11.5
1991	295	1	15	11	20.2	17.8	11.9
1991	309	1	29	3	21.0	17.9	14.8
1991	309	1	29	4	28.8	25.9	10.1
1991	309	1	29	5	14.2	12.8	9.9
1991	309	1	29	7	28.5	25.7	9.8
1991	309	1	29	8	21.8	18.9	13.3
1991	309	1	29	9	31.8	27.7	12.9
1991	309	1	29	10	11.4	9.9	13.2
1991	309	1	29	11	7.7	6.7	13.0
1991	323	1	43	3	35.9	30.5	15.0
1991	323	1	43	4	47.1	38.0	19.3
1991	323	1	43	5	57.1	51.4	10.0
1991	323	1	43	7	49.6	40.9	17.5
1991	323	1	43	8	20.1	15.0	25.4
1991	323	1	43	9	44.1	35.1	20.4
1991	323	1	43	10	35.2	28.1	20.2
1991	323	1	43	11	21.0	15.8	24.8
1991	337	1	57	3	65.9	42.2	36.0
1991	337	1	57	4	72.6	61.5	15.3
1991	337	1	57	5	53.8	47.2	12.3
1991	337	1	57	7	92.4	80.3	13.1
1991	337	1	57	8	86.5	59.0	31.8
1991	337	1	57	9	44.0	34.1	22.5
1991	337	1	57	10	42.4	29.3	30.9
1991	337	1	57	11	100.4	70.9	29.4
1991	351	1	71	3	129.9	111.5	14.2
1991	351	1	71	4	102.3	89.8	12.2
1991	351	1	71	5	76.2	64.5	15.4
1991	351	1	71	7	126.0	86.7	31.2
1991	351	1	71	8	212.9	142.7	33.0
1991	351	1	71	9	89.7	66.8	25.5
1991	351	1	71	10	151.1	112.8	25.3
1991	351	1	71	11	212.5	174.8	17.7
1992	14	1	99	3	29.6	23.1	22.0
1992	14	1	99	4	71.7	61.9	13.7
1992	14	1	99	5	63.7	57.5	9.7
1992	14	1	99	7	48.3	42.3	12.4
1992	14	1	99	8	61.0	56.6	7.2
1992	14	1	99	9	82.2	47.9	41.7
1992	14	1	99	10	54.0	49.0	9.3
1992	14	1	99	11	35.2	31.7	9.9

YEAR	JDATE	HARV #	SDATE	REP	GWT	DWT	PMOIST
1992	42	1	127	3	36.0	30.8	14.4
1992	42	1	127	4	72.4	58.2	19.6
1992	42	1	127	5	47.2	42.0	11.0
1992	42	1	127	7	46.4	40.5	12.7
1992	42	1	127	8	82.0	37.3	54.5
1992	42	1	127	9	80.6	65.6	18.6
1992	42	1	127	10	39.4	34.2	13.2
1992	42	1	127	11	55.4	46.8	15.5
1992	70	1	155	3	51.7	42.8	17.2
1992	70	1	155	4	51.5	39.7	22.9
1992	70	1	155	5	34.5	27.0	21.7
1992	70	1	155	7	33.6	29.0	13.7
1992	70	1	155	8	23.3	17.6	24.5
1992	70	1	155	9	31.6	25.6	19.0
1992	70	1	155	10	72.9	64.1	12.1
1992	70	1	155	11	94.4	83.2	11.9
1992	98	1	183	3	40.3	32.4	19.6
1992	98	1	183	4	59.3	53.2	10.3
1992	98	1	183	5	95.1	83.8	11.9
1992	98	1	183	7	39.8	32.1	19.3
1992	98	1	183	8	59.3	52.3	11.8
1992	98	1	183	9	104.0	85.4	17.9
1992	98	1	183	10	34.5	24.7	28.4
1992	98	1	183	11	52.5	39.6	24.6
1991	354	2	1	21	29.8	27.5	7.7
1991	354	2	1	22	60.0	56.0	6.7
1991	354	2	1	23	30.7	27.7	9.8
1991	354	2	1	24	83.1	78.1	6.0
1991	354	2	1	25	65.7	61.5	6.4
1991	354	2	1	26	58.2	54.3	6.7
1991	354	2	1	27	46.2	42.5	8.0
1991	354	2	1	29	55.7	51.6	7.4
1992	3	2	15	21	35.4	33.1	6.5
1992	3	2	15	22	54.2	50.6	6.6
1992	3	2	15	23	62.7	59.1	5.7
1992	3	2	15	24	71.5	67.4	5.7
1992	3	2	15	25	35.0	32.6	6.9
1992	3	2	15	26	70.4	66.5	5.5
1992	3	2	15	27	70.1	66.0	5.8
1992	3	2	15	29	80.0	75.3	5.9
1992	17	2	29	21	45.4	39.3	13.4
1992	17	2	29	22	65.1	58.0	10.9
1992	17	2	29	23	66.0	57.3	13.2
1992	17	2	29	24	43.9	38.3	12.8
1992	17	2	29	25	61.7	52.6	14.7
1992	17	2	29	26	47.9	41.5	13.4
1992	17	2	29	27	36.3	25.4	30.0
1992	17	2	29	29	17.1	14.3	16.4
1992	31	2	43	21	67.2	54.2	19.3
1992	31	2	43	22	122.7	102.0	16.9

YEAR	JDATE	HARV	#	SDATE	REP	GWT	DWT	PMOIST
1992	31	2	43	23		63.1	49.0	22.3
1992	31	2	43	24		63.4	50.0	21.1
1992	31	2	43	25		62.0	50.0	19.4
1992	31	2	43	26		79.4	67.7	14.7
1992	31	2	43	27		106.3	72.2	32.1
1992	31	2	43	29		65.5	51.5	21.4
1992	45	2	57	21		71.1	57.5	19.1
1992	45	2	57	22		47.7	36.9	22.6
1992	45	2	57	23		78.2	66.5	15.0
1992	45	2	57	24		49.5	38.0	23.2
1992	45	2	57	25		51.1	40.0	21.7
1992	45	2	57	26		86.9	74.8	13.9
1992	45	2	57	27		44.4	31.1	30.0
1992	45	2	57	29		98.0	80.2	18.2
1992	59	2	71	21		53.8	45.6	15.2
1992	59	2	71	22		47.0	36.0	23.4
1992	59	2	71	23		34.5	24.6	28.7
1992	59	2	71	24		88.3	72.9	17.4
1992	59	2	71	25		41.8	33.4	20.1
1992	59	2	71	26		72.4	61.3	15.3
1992	59	2	71	27		78.9	65.7	16.7
1992	59	2	71	29		77.7	63.7	18.0
1992	87	2	99	21		47.5	41.8	12.0
1992	87	2	99	22		82.5	70.5	14.5
1992	87	2	99	23		54.2	47.2	12.9
1992	87	2	99	24		34.3	28.9	15.7
1992	87	2	99	25		19.8	16.9	14.6
1992	87	2	99	26		71.8	62.1	13.5
1992	87	2	99	27		71.2	60.8	14.6
1992	87	2	99	29		80.0	70.1	12.4
1992	115	2	127	21		52.0	45.3	12.9
1992	115	2	127	22		58.8	49.4	16.0
1992	115	2	127	23		86.2	75.0	13.0
1992	115	2	127	24		99.5	85.6	14.0
1992	115	2	127	25		69.5	61.3	11.8
1992	115	2	127	26		97.7	83.1	14.9
1992	115	2	127	27		81.1	68.2	15.9
1992	115	2	127	29		64.0	56.1	12.3
1992	143	2	155	21		29.0	27.0	6.9
1992	143	2	155	22		63.9	59.1	7.5
1992	143	2	155	23		69.2	64.5	6.8
1992	143	2	155	24		57.5	53.0	7.8
1992	143	2	155	25		35.4	31.3	11.6
1992	143	2	155	26		71.7	65.6	8.5
1992	143	2	155	27		79.0	72.4	8.4
1992	143	2	155	29		71.9	66.1	8.1
1992	171	2	183	21		44.8	36.8	17.9
1992	171	2	183	22		63.3	51.9	18.0
1992	171	2	183	23		40.4	31.5	22.0
1992	171	2	183	24		57.7	47.7	17.3

YEAR	JDATE	HARV #	SDATE	REP	GWT	DWT	PMOIST
1992	171	2	183	25	101.2	84.8	16.2
1992	171	2	183	26	80.7	67.1	16.9
1992	171	2	183	27	63.5	53.5	15.7
1992	171	2	183	29	70.2	58.9	16.1

YEAR	JDATE	HARV	SDATE	REP	% Moist	DM	DWT		BWT		WWT H2O	PBWT	GVOL	Den	Den cor
							gr sl	dry sl	jar+grsl	jar+H2O					
1992	3	2	15	23	5.7	0.94	14.8	14.0	441.5	1450.2	1023.5	1443.0	22.0	0.63	0.66
1992	3	2	15	24	5.7	0.94	17.3	16.3	444.0	1450.2	1023.5	1442.2	25.3	0.64	0.67
1992	3	2	15	25	6.9	0.93	21.7	20.2	448.4	1450.2	1023.5	1441.1	30.8	0.66	0.68
1992	3	2	15	26	5.5	0.95	18.2	17.2	444.9	1450.0	1023.3	1442.2	26.0	0.66	0.68
1992	3	2	15	27	5.8	0.94	23.0	21.7	449.7	1450.3	1023.6	1440.0	33.3	0.65	0.67
1992	3	2	15	29	5.9	0.94	22.7	21.4	449.4	1450.0	1023.3	1439.9	32.8	0.65	0.67
1992	17	2	29	21	13.4	0.87	16.9	14.6	443.6	1451.3	1024.6	1442.6	25.6	0.57	0.61
1992	17	2	29	22	10.9	0.89	19.1	17.0	445.8	1451.2	1024.5	1443.3	27.0	0.63	0.67
1992	17	2	29	23	13.2	0.87	18.8	16.3	445.5	1451.4	1024.7	1442.4	27.8	0.59	0.63
1992	17	2	29	24	12.8	0.87	26.0	22.7	452.7	1451.3	1024.6	1438.0	39.3	0.58	0.62
1992	17	2	29	25	14.7	0.85	17.5	14.9	444.2	1451.3	1024.6	1442.3	26.5	0.56	0.61
1992	17	2	29	26	13.4	0.87	21.7	18.8	448.4	1451.5	1024.8	1441.7	31.5	0.60	0.64
1992	17	2	29	27	30.0	0.70	25.4	17.8	452.1	1451.3	1024.6	1439.3	37.4	0.48	0.55
1992	17	2	29	29	16.4	0.84	14.3	12.0	441.0	1451.2	1024.5	1444.8	20.7	0.58	0.63
1992	31	2	43	21	19.3	0.81	21.5	17.4	448.3	1450.7	1023.9	1440.3	31.9	0.54	0.60
1992	31	2	43	22	16.9	0.83	25.7	21.4	452.5	1450.6	1023.8	1440.3	36.0	0.59	0.65
1992	31	2	43	23	22.3	0.78	24.2	18.8	451.0	1450.5	1023.7	1441.3	33.4	0.56	0.63
1992	31	2	43	24	21.1	0.79	22.7	17.9	449.5	1450.7	1023.9	1440.3	33.1	0.54	0.60
1992	31	2	43	25	19.4	0.81	22.9	18.5	449.7	1450.3	1023.5	1441.5	31.7	0.58	0.65
1992	31	2	43	26	14.7	0.85	25.8	22.0	452.6	1450.4	1023.6	1439.1	37.1	0.59	0.64
1992	31	2	43	27	32.1	0.68	21.1	14.3	447.9	1450.4	1023.6	1443.1	28.4	0.50	0.59
1992	31	2	43	29	21.4	0.79	22.9	18.0	449.7	1450.5	1023.7	1439.7	33.7	0.53	0.60
1992	45	2	57	21	19.1	0.81	20.5	16.6	447.2	1450.0	1023.3	1440.7	29.8	0.56	0.62
1992	45	2	57	22	22.6	0.77	32.7	25.3	459.4	1450.0	1023.3	1434.0	48.7	0.52	0.58
1992	45	2	57	23	15.0	0.85	17.1	14.5	443.8	1450.0	1023.3	1441.2	25.9	0.56	0.61
1992	45	2	57	24	23.2	0.77	25.2	19.4	451.9	1450.1	1023.4	1438.2	37.1	0.52	0.59
1992	45	2	57	25	21.7	0.78	22.3	17.5	449.0	1450.0	1023.3	1439.0	33.3	0.52	0.58
1992	45	2	57	26	13.9	0.86	21.4	18.4	448.1	1449.9	1023.2	1440.1	31.2	0.59	0.64
1992	45	2	57	27	30.0	0.70	21.9	15.3	448.6	1450.3	1023.6	1439.2	33.0	0.46	0.53
1992	45	2	57	29	18.2	0.82	24.2	19.8	450.9	1449.8	1023.1	1437.9	36.1	0.55	0.60
1992	59	2	71	21	15.2	0.85	24.5	20.8	451.2	1451.6	1024.9	1440.6	35.5	0.59	0.64
1992	59	2	71	22	23.4	0.77	16.7	12.8	443.4	1451.4	1024.7	1442.5	25.6	0.50	0.56
1992	59	2	71	23	28.7	0.71	16.7	11.9	443.4	1451.4	1024.7	1442.8	25.3	0.47	0.54
1992	59	2	71	24	17.4	0.83	21.3	17.6	448.0	1451.6	1024.9	1442.7	30.2	0.58	0.64
1992	59	2	71	25	20.1	0.80	18.5	14.8	445.2	1451.6	1024.9	1443.5	26.6	0.56	0.62
1992	59	2	71	26	15.3	0.85	19.1	16.2	445.8	1451.3	1024.6	1442.5	27.9	0.58	0.63
1992	59	2	71	27	16.7	0.83	20.4	17.0	447.1	1450.9	1024.2	1440.3	31.0	0.55	0.60
1992	59	2	71	29	18.0	0.82	21.0	17.2	447.7	1451.3	1024.6	1441.8	30.5	0.56	0.62
1992	87	2	99	21	12.0	0.88	20.3	17.9	447.0	1450.3	1023.6	1439.6	31.0	0.58	0.61
1992	87	2	99	22	14.5	0.86	19.4	16.6	446.1	1450.3	1023.6	1440.3	29.4	0.56	0.61
1992	87	2	99	23	12.9	0.87	19.8	17.2	446.5	1450.1	1023.4	1441.2	28.7	0.60	0.65
1992	87	2	99	24	15.7	0.84	32.1	27.1	458.8	1449.9	1023.2	1432.6	49.4	0.55	0.59

YEAR	JDATE	HARV	SDATE	REP	% Moist	DM	gr sl	DWT	BWT	WWT H2O	PBWT	GVOL	Den	Den cor	
					dry sl			jar+grsl	jar+H2O						
1992	87	2	99	25	14.6	0.85	17.5	14.9	444.2	1450.2	1023.5	1441.7	26.0	0.57	0.62
1992	87	2	99	26	13.5	0.87	20.5	17.7	447.2	1450.5	1023.8	1441.4	29.6	0.60	0.65
1992	87	2	99	27	14.6	0.85	18.9	16.1	445.6	1450.2	1023.5	1441.3	27.8	0.58	0.63
1992	87	2	99	29	12.4	0.88	18.4	16.1	445.1	1450.1	1023.4	1441.0	27.5	0.59	0.63
1992	115	2	127	21	12.9	0.87	16.8	14.6	443.4	1451.2	1024.6	1443.4	24.6	0.59	0.64
1992	115	2	127	22	16.0	0.84	17.9	15.0	444.5	1451.5	1024.9	1443.5	25.9	0.58	0.63
1992	115	2	127	23	13.0	0.87	20.6	17.9	447.2	1451.0	1024.4	1442.3	29.3	0.61	0.66
1992	115	2	127	24	14.0	0.86	19.6	16.9	446.2	1451.2	1024.6	1441.1	29.7	0.57	0.61
1992	115	2	127	25	11.8	0.88	25.3	22.3	451.9	1450.8	1024.2	1439.0	37.1	0.60	0.64
1992	115	2	127	26	14.9	0.85	22.6	19.2	449.2	1450.8	1024.2	1439.2	34.2	0.56	0.61
1992	115	2	127	27	15.9	0.84	21.0	17.7	447.6	1451.0	1024.4	1442.9	29.1	0.61	0.66
1992	115	2	127	29	12.3	0.88	21.5	18.9	448.1	1451.3	1024.7	1441.3	31.5	0.60	0.64
1992	143	2	155	21	6.9	0.93	18.1	16.9	444.7	1451.3	1024.7	1442.5	26.9	0.63	0.65
1992	143	2	155	22	7.5	0.93	19.3	17.9	445.9	1451.4	1024.8	1443.5	27.2	0.66	0.69
1992	143	2	155	23	6.8	0.93	19.6	18.3	446.2	1451.0	1024.4	1441.6	29.0	0.63	0.66
1992	143	2	155	24	7.8	0.92	27.6	25.4	454.2	1451.2	1024.6	1436.7	42.1	0.60	0.63
1992	143	2	155	25	11.6	0.88	21.7	19.2	448.3	1451.2	1024.6	1442.1	30.8	0.62	0.67
1992	143	2	155	26	8.5	0.92	16.8	15.4	443.4	1451.4	1024.8	1439.7	28.5	0.54	0.56
1992	143	2	155	27	8.4	0.92	17.1	15.7	443.7	1451.6	1025.0	1442.6	26.1	0.60	0.63
1992	143	2	155	29	8.1	0.92	15.3	14.1	441.9	1451.1	1024.5	1442.2	24.2	0.58	0.61
1992	171	2	183	21	17.9	0.82	26.8	22.0	453.5	1451.2	1024.5	1440.9	37.1	0.59	0.66
1992	171	2	183	22	18.0	0.82	24.3	19.9	451.0	1451.2	1024.5	1443.8	31.7	0.63	0.70
1992	171	2	183	23	22.0	0.78	22.7	17.7	449.4	1451.3	1024.6	1444.2	29.8	0.59	0.67
1992	171	2	183	24	17.3	0.83	18.7	15.5	445.4	1451.0	1024.3	1442.7	27.0	0.57	0.63
1992	171	2	183	25	16.2	0.84	17.5	14.7	444.2	1450.9	1024.2	1444.6	23.8	0.62	0.68
1992	171	2	183	26	16.9	0.83	16.3	13.5	443.0	1450.8	1024.1	1441.7	25.4	0.53	0.58
1992	171	2	183	27	15.7	0.84	21.0	17.7	447.7	1451.0	1024.3	1443.1	28.9	0.61	0.67
1992	171	2	183	29	16.1	0.84	21.5	18.0	448.2	1451.1	1024.4	1441.2	31.4	0.57	0.63

BRANSBY file name: SLML.wk1 4 pages

YEAR	JDATE	HARV	SDATE	REP	Den 0	Den next	ML
1991	295	1	15	3	0.50	0.64	-0.15
1991	295	1	15	4	0.67	0.57	0.10
1991	295	1	15	5	0.69	0.64	0.05
1991	295	1	15	7	0.61	0.61	0.00
1991	295	1	15	8	0.54	0.55	-0.00
1991	295	1	15	9	0.65	0.54	0.11
1991	295	1	15	10	0.73	0.63	0.10
1991	295	1	15	11	0.72	0.74	-0.02
1991	309	1	29	3	0.64	0.58	0.07
1991	309	1	29	4	0.57	0.59	-0.02
1991	309	1	29	5	0.64	0.61	0.02
1991	309	1	29	7	0.61	0.64	-0.03
1991	309	1	29	8	0.55	0.60	-0.05
1991	309	1	29	9	0.54	0.61	-0.07
1991	309	1	29	10	0.63	0.63	0.00
1991	309	1	29	11	0.74	0.59	0.15
1991	323	1	43	3	0.58	0.64	-0.07
1991	323	1	43	4	0.59	0.61	-0.02
1991	323	1	43	5	0.61	0.67	-0.06
1991	323	1	43	7	0.64	0.78	-0.14
1991	323	1	43	8	0.60	0.59	0.01
1991	323	1	43	9	0.61	0.62	-0.01
1991	323	1	43	10	0.63	0.63	0.00
1991	323	1	43	11	0.59	0.56	0.02
1991	337	1	57	3	0.64	0.72	-0.08
1991	337	1	57	4	0.61	0.62	-0.02
1991	337	1	57	5	0.67	0.62	0.06
1991	337	1	57	7	0.78	0.65	0.14
1991	337	1	57	8	0.59	0.60	-0.01
1991	337	1	57	9	0.62	0.66	-0.05
1991	337	1	57	10	0.63	0.58	0.05
1991	337	1	57	11	0.56	0.63	-0.07
1991	351	1	71	3	0.72	0.67	0.05
1991	351	1	71	4	0.62	0.61	0.01
1991	351	1	71	5	0.62	0.66	-0.04
1991	351	1	71	7	0.65	0.64	0.01
1991	351	1	71	8	0.60	0.68	-0.08
1991	351	1	71	9	0.66	0.43	0.23
1991	351	1	71	10	0.58	0.62	-0.04
1991	351	1	71	11	0.63	0.65	-0.01
1991	14	1	99	3	0.67	0.53	0.13
1991	14	1	99	4	0.61	0.60	0.01
1991	14	1	99	5	0.66	0.71	-0.05
1991	14	1	99	7	0.64	0.72	-0.09
1991	14	1	99	8	0.68	0.47	0.21
1991	14	1	99	9	0.43	0.60	-0.16
1991	14	1	99	10	0.62	0.50	0.13

YEAR	JDATE	HARV	SDATE	REP	Den 0	Den next	ML
1991	14	1	99	11	0.65	0.63	0.01
1991	42	1	127	3	0.53	0.56	-0.02
1991	42	1	127	4	0.60	0.56	0.04
1991	42	1	127	5	0.71	0.62	0.09
1991	42	1	127	7	0.72	0.68	0.04
1991	42	1	127	8	0.47	0.65	-0.18
1991	42	1	127	9	0.60	0.63	-0.04
1991	42	1	127	10	0.50	0.56	-0.06
1991	42	1	127	11	0.63	0.67	-0.04
1991	70	1	155	3	0.56	0.63	-0.07
1991	70	1	155	4	0.56	0.67	-0.11
1991	70	1	155	5	0.62	0.53	0.09
1991	70	1	155	7	0.68	0.60	0.08
1991	70	1	155	8	0.65	0.59	0.06
1991	70	1	155	9	0.63	0.54	0.09
1991	70	1	155	10	0.56	0.55	0.01
1991	70	1	155	11	0.67	0.72	-0.05
1991	98	1	183	3	0.63		
1991	98	1	183	4	0.67		
1991	98	1	183	5	0.53		
1991	98	1	183	7	0.60		
1991	98	1	183	8	0.59		
1991	98	1	183	9	0.54		
1991	98	1	183	10	0.55		
1991	98	1	183	11	0.72		
1991	354	2	1	21	0.66	0.70	-0.04
1991	354	2	1	22	0.68	0.66	0.02
1991	354	2	1	23	0.68	0.66	0.03
1991	354	2	1	24	0.68	0.66	0.02
1991	354	2	1	25	0.67	0.68	-0.01
1991	354	2	1	26	0.67	0.68	-0.01
1991	354	2	1	27	0.67	0.67	0.00
1991	354	2	1	29	0.70	0.67	0.02
1992	3	2	15	21	0.70	0.61	0.09
1992	3	2	15	22	0.66	0.67	-0.01
1992	3	2	15	23	0.66	0.63	0.02
1992	3	2	15	24	0.66	0.62	0.04
1992	3	2	15	25	0.68	0.61	0.08
1992	3	2	15	26	0.68	0.64	0.04
1992	3	2	15	27	0.67	0.55	0.13
1992	3	2	15	29	0.67	0.63	0.04
1992	17	2	29	21	0.61	0.60	0.01
1992	17	2	29	22	0.67	0.65	0.02
1992	17	2	29	23	0.63	0.63	-0.00
1992	17	2	29	24	0.62	0.60	0.01
1992	17	2	29	25	0.61	0.65	-0.04
1992	17	2	29	26	0.64	0.64	-0.00
1992	17	2	29	27	0.55	0.59	-0.05
1992	17	2	29	29	0.63	0.60	0.04
1992	31	2	43	21	0.60	0.62	-0.01

YEAR	JDATE	HARV	SDATE	REP	Den 0	Den next	ML
1992	31	2	43	22	0.65	0.58	0.07
1992	31	2	43	23	0.63	0.61	0.03
1992	31	2	43	24	0.60	0.59	0.02
1992	31	2	43	25	0.65	0.58	0.06
1992	31	2	43	26	0.64	0.64	0.01
1992	31	2	43	27	0.59	0.53	0.06
1992	31	2	43	29	0.60	0.60	-0.01
1992	45	2	57	21	0.62	0.64	-0.02
1992	45	2	57	22	0.58	0.56	0.02
1992	45	2	57	23	0.61	0.54	0.07
1992	45	2	57	24	0.59	0.64	-0.06
1992	45	2	57	25	0.58	0.62	-0.03
1992	45	2	57	26	0.64	0.63	0.01
1992	45	2	57	27	0.53	0.60	-0.07
1992	45	2	57	29	0.60	0.62	-0.02
1992	59	2	71	21	0.64	0.61	0.02
1992	59	2	71	22	0.56	0.61	-0.05
1992	59	2	71	23	0.54	0.65	-0.11
1992	59	2	71	24	0.64	0.52	0.12
1992	59	2	71	25	0.62	0.62	-0.00
1992	59	2	71	26	0.63	0.65	-0.02
1992	59	2	71	27	0.60	0.63	-0.03
1992	59	2	71	29	0.62	0.63	-0.01
1992	87	2	99	21	0.61	0.64	-0.02
1992	87	2	99	22	0.61	0.63	-0.02
1992	87	2	99	23	0.65	0.66	-0.01
1992	87	2	99	24	0.52	0.61	-0.09
1992	87	2	99	25	0.62	0.64	-0.02
1992	87	2	99	26	0.65	0.61	0.04
1992	87	2	99	27	0.63	0.66	-0.04
1992	87	2	99	29	0.63	0.64	-0.01
1992	115	2	127	21	0.64	0.65	-0.01
1992	115	2	127	22	0.63	0.69	-0.05
1992	115	2	127	23	0.66	0.66	0.00
1992	115	2	127	24	0.61	0.63	-0.02
1992	115	2	127	25	0.64	0.67	-0.02
1992	115	2	127	26	0.61	0.56	0.05
1992	115	2	127	27	0.66	0.63	0.04
1992	115	2	127	29	0.64	0.61	0.03
1992	143	2	155	21	0.65	0.66	-0.00
1992	143	2	155	22	0.69	0.70	-0.01
1992	143	2	155	23	0.66	0.67	-0.02
1992	143	2	155	24	0.63	0.63	0.00
1992	143	2	155	25	0.67	0.68	-0.01
1992	143	2	155	26	0.56	0.58	-0.02
1992	143	2	155	27	0.63	0.67	-0.04
1992	143	2	155	29	0.61	0.63	-0.02
1992	171	2	183	21	0.66		
1992	171	2	183	22	0.70		
1992	171	2	183	23	0.67		

YEAR	JDATE	HARV	SDATE	REP	Den 0	Den next	ML
1992	171	2	183	24	0.63		
1992	171	2	183	25	0.68		
1992	171	2	183	26	0.58		
1992	171	2	183	27	0.67		
1992	171	2	183	29	0.63		

YEAR	1992	1992	1992	1992	1992	1992	1992	1992	1992	1992	1992	1992
JULIAN DATE	17	24	31	38	45	52	59	66	73	80	87	94
STUDY DAY	102	109	116	123	130	137	144	151	158	165	172	179
AIR TEMP	7.2	-2.3	14.3	1.7	13.2	16.3	21.2	16.1	10.1	22.8	19.4	10.8
REP	SAMPLE											
1	1	3.5	6.0	12.9	13.7	16.6	17.7	13.8	18.0	10.7	14.6	19.2
	2	5.0	6.1	13.3	14.4	15.7	14.4	11.7	15.3	8.5	15.2	17.3
	3	1.4	5.8	11.6	12.6	16.5	13.1	11.0	13.1	9.1	15.9	18.0
	4	1.2	15.0	19.3	14.1	17.8	20.0	12.3	20.8	11.7	9.4	13.8
	5	-0.2	13.1	15.2	11.4	15.2	16.4	10.0	16.9	12.7	10.2	14.6
	6	-0.1	11.6	13.3	8.1	15.7	16.0	10.1	17.3	11.5	8.9	13.2
2	1	2.3	16.7	25.6	16.1	18.9	25.4	15.3	16.2	10.3	9.3	15.1
	2	3.1	9.3	11.9	12.3	14.1	14.9	10.8	14.3	11.4	14.3	15.2
	3	2.4	9.8	13.6	11.8	17.2	14.9	13.3	16.3	11.5	15.5	18.9
	4	4.1	19.2	29.7	19.3	17.3	28.3	18.5	22.3	12.7	11.0	16.3
	5	2.0	15.8	16.0	13.0	15.2	20.8	13.2	14.6	15.1	12.8	14.5
	6	5.3	19.0	22.6	16.3	16.0	22.2	16.8	20.5	14.8	12.3	15.2
3	1	4.4	9.0	11.9	12.0	16.7	18.1	12.4	13.0	13.1	15.3	15.6
	2	3.2	8.9	12.1	12.4	13.6	13.8	11.6	14.7	8.0	15.4	16.6
	3	5.6	8.5	14.0	16.0	16.6	14.5	13.8	15.1	10.7	19.3	20.1
	4	4.0	11.2	13.4	12.5	18.2	19.3	12.7	14.5	14.5	14.6	15.0
	5	1.1	13.7	16.8	12.9	13.7	16.6	11.9	15.4	15.6	11.2	16.1
	6	10.3	13.2	13.3	9.2	13.5	16.0	12.2	15.2	14.7	9.3	14.1
4	1	7.1	16.2	26.3	20.6	22.3	26.3	24.5	24.7	15.9	13.9	16.1
	2	4.9	11.0	14.2	33.4	17.7	16.2	13.8	15.5	11.3	14.8	16.5
	3	5.5	13.8	17.2	12.6	15.5	14.3	16.1	15.3	14.3	15.5	17.0
	4	12.9	15.8	31.0	33.0	19.5	30.2	27.4	26.7	16.6	6.7	16.7
	5	7.3	12.7	18.5	12.3	13.5	14.8	19.0	18.5	15.8	16.2	15.0
	6	10.0	12.6	19.8	14.3	11.8	17.9	20.4	19.6	15.2	9.4	15.4

YEAR	1992	1992	1992	1992	1992	1992	1992	1992	1992	1992	1992
JULIAN DATE	94	101	115	122	129	136	143	150	157	164	171
STUDY DAY	106	113	127	134	141	148	155	162	169	176	183
AIR TEMP	10.8	24.5	28.5	22.4	18.4	23.2	24.0	21.5	24.0	18.7	23.3
REP	SAMPLE										
22	1	11.1	24.1	29.7	23.9	23.7	25.8	27.7	31.4	33.5	23.8
	2	8.9	23.5	26.4	22.2	19.5	23.2	23.7	27.3	28.5	20.4
	3	8.6	22.4	22.3	21.6	20.0	23.2	25.2	26.9	27.9	22.3
	4	6.1	25.5	23.7	25.9	17.4	22.1	24.1	27.8	28.5	20.4
	5	7.7	26.3	22.2	25.5	16.7	22.9	24.2	28.4	26.2	21.0
	6	10.8	23.1	19.7	21.8	12.0	21.8	24.4	26.8	23.7	21.2
23	1	9.0	24.1	30.6	23.5	25.7	27.0	29.9	31.3	33.4	24.9
	2	6.7	22.3	30.2	21.4	23.5	24.5	25.1	26.9	30.3	22.4
	3	6.1	20.6	18.5	19.1	15.6	21.0	23.7	24.4	24.0	21.8
	4	9.3	22.0	25.2	20.4	19.4	24.6	26.3	29.0	28.3	21.4
	5	9.4	25.1	19.7	23.8	11.8	25.3	25.3	26.8	24.3	21.0
	6	9.4	24.5	25.7	23.8	20.8	23.5	24.4	27.7	27.6	21.2
26	1	10.9	25.2	30.4	24.1	25.9	28.1	31.0	29.5	30.6	24.8
	2	5.3	22.2	28.3	21.4	22.7	23.4	25.4	26.5	27.9	22.9
	3	3.0	21.2	20.9	19.7	18.7	21.8	23.0	25.0	24.5	22.2
	4	10.0	23.8	24.7	22.9	15.2	21.4	23.3	23.6	27.9	25.8
	5	9.8	22.5	21.6	21.1	14.3	21.3	23.0	24.2	26.1	25.0
	6	9.5	18.2	19.3	17.5	12.2	20.8	20.7	21.9	23.8	23.7
27	1	10.8	26.9	30.7	26.3	23.7	28.5	31.1	31.4	29.7	25.3
	2	8.5	25.1	31.3	23.9	21.2	22.5	26.6	28.0	27.6	23.4
	3	3.5	21.2	27.6	20.4	19.6	18.8	21.9	24.3	27.1	23.5
	4	8.3	21.7	21.8	22.2	11.6	17.4	19.8	21.3	25.0	20.3
	5	7.3	25.6	28.9	24.2	20.8	23.7	25.2	26.0	27.6	23.0
	6	7.6	20.4	22.0	18.8	16.8	18.1	21.6	21.9	25.3	21.1

BRANSBY file name: SLRS.wk1

YEAR	JDATE	SDATE	Monthly Rain (cm)	
			S1	S2
1991	304	24	0.3	(from J281 to J304 - Oct 8 to Oct 31, 1991; 24 days)
1991	334	54	12.7	
1991	365	85	12	7.8
1992	31	116	43	17.9
1992	60	145	72	16.8
1992	91	176	103	10.2
1992	121		133	5.6
1992	152		164	3.0
1992	171		183	11.7 (from J153 to J171 - Jun 1 to Jun 19, 1992; 19 days)

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YEAR	JDATE	SDATE	Avg Temp (C)	Avg RH (%)
1991	281	1	11.1	57
1991	282	2	15.0	60
1991	283	3	17.8	69
1991	284	4	17.8	65
1991	285	5	17.8	53
1991	286	6	19.4	55
1991	287	7	17.8	54
1991	288	8	20.6	64
1991	289	9	13.9	55
1991	290	10	11.7	51
1991	291	11	15.6	57
1991	292	12	17.8	54
1991	293	13	19.4	61
1991	294	14	20.0	65
1991	295	15	20.0	71
1991	296	16	20.6	68
1991	297	17	22.8	72
1991	298	18	21.7	76
1991	299	19	22.2	79
1991	300	20	22.8	78
1991	301	21	21.7	65
1991	302	22	21.7	65
1991	303	23	17.8	66
1991	304	24	18.3	78
1991	305	25	20.6	85
1991	306	26	12.2	71
1991	307	27	7.8	71
1991	308	28	2.8	53
1991	309	29	2.2	54
1991	310	30	6.1	63
1991	311	31	8.3	58
1991	312	32	11.1	66
1991	313	33	5.6	69
1991	314	34	6.7	52
1991	315	35	8.9	41
1991	316	36	9.4	46
1991	317	37	10.6	49
1991	318	38	12.8	51
1991	319	39	15.0	62
1991	320	40	16.7	74
1991	321	41	18.3	63
1991	322	42	21.7	76
1991	323	43	18.3	75
1991	324	44	21.7	83
1991	325	45	20.6	96

YEAR	JDATE	SDATE	Avg Temp (C)	Avg RH (%)
1991	326	46	13.9	85
1991	327	47	11.7	84
1991	328	48	8.3	64
1991	329	49	3.3	55
1991	330	50	4.4	49
1991	331	51	6.1	42
1991	332	52	9.4	51
1991	333	53	13.3	68
1991	334	54	17.8	86
1991	335	55	20.6	83
1991	336	56	22.8	81
1991	337	57	18.9	87
1991	338	58	6.1	63
1991	339	59	2.2	57
1991	340	60	3.3	66
1991	341	61	7.2	69
1991	342	62	10.0	88
1991	343	63	15.0	90
1991	344	64	15.0	71
1991	345	65	12.2	81
1991	346	66	11.7	80
1991	347	67	13.9	89
1991	348	68	18.3	72
1991	349	69	9.4	46
1991	350	70	6.1	55
1991	351	71	5.0	61
1991	352	72	6.7	50
1991	353	73	5.6	42
1991	354	74	3.9	46
1991	355	75	5.6	64
1991	356	76	13.9	89
1991	357	77	14.4	95
1991	358	78	11.7	87
1991	359	79	5.0	82
1991	360	80	7.8	57
1991	361	81	10.6	89
1991	362	82	9.4	95
1991	363	83	8.9	95
1991	364	84	6.7	77
1991	365	85	7.2	72
1992	1	86	8.9	73
1992	2	87	8.9	95
1992	3	88	8.9	88
1992	4	89	8.3	82
1992	5	90	9.4	85
1992	6	91	7.2	68
1992	7	92	7.2	69
1992	8	93	7.8	73

YEAR	JDATE	SDATE	Avg Temp (C)	Avg RH (%)
1992	9	94	10.0	95
1992	10	95	9.4	68
1992	11	96	2.8	60
1992	12	97	5.0	63
1992	13	98	10.6	96
1992	14	99	11.7	72
1992	15	100	1.1	66
1992	16	101	0.0	54
1992	17	102	-2.8	51
1992	18	103	2.2	71
1992	19	104	0.6	85
1992	20	105	-0.6	62
1992	21	106	2.8	56
1992	22	107	6.7	56
1992	23	108	9.4	87
1992	24	109	6.7	64
1992	25	110	3.3	58
1992	26	111	7.2	52
1992	27	112	10.6	68
1992	28	113	10.0	93
1992	29	114	9.4	84
1992	30	115	11.7	89
1992	31	116	10.0	72
1992	32	117	10.0	54
1992	33	118	8.9	46
1992	34	119	9.4	52
1992	35	120	11.1	54
1992	36	121	11.1	71
1992	37	122	9.4	67
1992	38	123	6.7	68
1992	39	124	7.2	66
1992	40	125	3.3	47
1992	41	126	4.4	48
1992	42	127	7.8	51
1992	43	128	10.0	58
1992	44	129	12.8	75
1992	45	130	12.8	98
1992	46	131	13.9	89
1992	47	132	16.1	67
1992	48	133	15.6	84
1992	49	134	9.4	93
1992	50	135	14.4	69
1992	51	136	11.1	61
1992	52	137	10.6	61
1992	53	138	12.8	76
1992	54	139	15.0	78
1992	55	140	17.2	79
1992	56	141	16.7	95

YEAR	JDATE	SDATE	Avg Temp (C)	Avg RH (%)
1992	57	142	15.0	89
1992	58	143	4.4	71
1992	59	144	6.1	62
1992	60	145	13.3	53
1992	61	146	13.9	49
1992	62	147	15.0	60
1992	63	148	16.7	57
1992	64	149	18.9	60
1992	65	150	19.4	81
1992	66	151	17.2	86
1992	67	152	20.0	78
1992	68	153	18.9	63
1992	69	154	19.4	53
1992	70	155	21.7	76
1992	71	156	7.2	54
1992	72	157	2.2	56
1992	73	158	7.2	57
1992	74	159	5.0	59
1992	75	160	11.1	49
1992	76	161	9.4	44
1992	77	162	8.9	50
1992	78	163	15.0	84
1992	79	164	16.7	75
1992	80	165	15.0	62
1992	81	166	7.2	58
1992	82	167	10.0	83
1992	83	168	9.4	70
1992	84	169	7.8	54
1992	85	170	11.1	79
1992	86	171	10.0	77
1992	87	172	13.3	51
1992	88	173	12.2	40
1992	89	174	14.4	63
1992	90	175	14.4	73
1992	91	176	15.0	71
1992	92	177	10.6	67
1992	93	178	9.4	59
1992	94	179	6.7	47
1992	95	180	7.2	50
1992	96	181	12.8	42
1992	97	182	13.3	57
1992	98	183	12.2	95
1992	99	184	15.0	71
1992	100	185	18.3	72
1992	101	186	18.9	73
1992	102	187	21.7	74
1992	103	188	21.1	77
1992	104	189	22.2	70

YEAR	JDATE	SDATE	Avg Temp (C)	Avg RH (%)
1992	105	190	20.0	73
1992	106	191	18.9	63
1992	107	192	20.0	66
1992	108	193	21.1	70
1992	109	194	20.0	67
1992	110	195	23.3	82
1992	111	196	20.0	89
1992	112	197	20.0	78
1992	113	198	18.3	65
1992	114	199	19.4	62
1992	115	200	21.1	71
1992	116	201	23.3	64
1992	117	202	14.4	62
1992	118	203	10.0	67
1992	119	204	8.9	62
1992	120	205	12.2	56
1992	121	206	13.9	66
1992	122	207	18.9	63
1992	123	208	22.8	62
1992	124	209	22.2	66
1992	125	210	21.1	41
1992	126	211	19.4	48
1992	127	212	17.2	70
1992	128	213	12.8	88
1992	129	214	8.9	71
1992	130	215	15.0	59
1992	131	216	17.2	54
1992	132	217	20.0	56
1992	133	218	22.2	62
1992	134	219	23.3	76
1992	135	220	21.1	67
1992	136	221	23.3	62
1992	137	222	25.0	76
1992	138	223	22.8	62
1992	139	224	23.9	58
1992	140	225	23.3	56
1992	141	226	25.0	70
1992	142	227	22.8	62
1992	143	228	22.2	50
1992	144	229	21.1	40
1992	145	230	21.7	41
1992	146	231	25.0	69
1992	147	232	21.1	75
1992	148	233	20.6	69
1992	149	234	21.7	85
1992	150	235	20.6	88
1992	151	236	22.2	78
1992	152	237	19.4	58

YEAR	JDATE	SDATE	Avg Temp (C)	Avg RH (%)
1992	153	238	22.2	57
1992	154	239	19.4	68
1992	155	240	23.3	86
1992	156	241	20.0	76
1992	157	242	22.2	73
1992	158	243	23.3	70
1992	159	244	26.1	73
1992	160	245	26.7	92
1992	161	246	26.1	80
1992	162	247	26.7	74
1992	163	248	27.8	86
1992	164	249	25.0	90
1992	165	250	19.4	93
1992	166	251	21.1	82
1992	167	252	23.9	79
1992	168	253	26.1	71
1992	169	254	27.8	75
1992	170	255	26.1	76
1992	171	256	25.6	77

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YEAR	JDATE	HARV #	REP	SAMPLE	TEMP	COLD	TEMP	HOT	READING
						READING		READING	
1991	282	1	1	1	21.3	23.6	64.2	68.4	
1991	282	1		2		24.4		69.6	
1991	282	1		3		26.2		71.0	
1991	282	1		4		23.3		67.9	
1991	282	1		5		23.7		68.0	
1991	282	1		6		23.0		67.8	
1991	282	1	2	1	21.5	23.1	62.0	65.9	
1991	282	1		2		24.3		66.7	
1991	282	1		3		26.4		68.9	
1991	282	1		4		23.4		66.7	
1991	282	1		5		24.3		65.8	
1991	282	1		6		24.2		66.6	
1991	282	1	3	1	21.4	23.2	60.5	63.5	
1991	282	1		2		23.0		63.7	
1991	282	1		3		26.0		68.0	
1991	282	1		4		23.3		64.6	
1991	282	1		5		24.2		65.1	
1991	282	1		6		23.4		64.0	
1991	282	1	4	1	21.3	23.5	58.0	63.1	
1991	282	1		2		23.5		63.0	
1991	282	1		3		25.7		65.2	
1991	282	1		4		24.0		62.9	
1991	282	1		5		23.9		61.9	
1991	282	1		6		23.4		61.6	
1992	171	1	1	1	19.4	24.5	62.3	69.6	
1992	171	1		2		24.8		70.2	
1992	171	1		3		26.7		71.5	
1992	171	1		4		24.3		68.7	
1992	171	1		5		24.0		68.4	
1992	171	1		6		23.5		68.5	
1992	171	1	2	1	20.2	24.0	61.5	67.7	
1992	171	1		2		23.8		67.5	
1992	171	1		3		27.5		71.1	
1992	171	1		4		24.1		67.9	
1992	171	1		5		24.7		67.3	
1992	171	1		6		24.8		68.7	
1992	171	1	3	1	20.3	24.2	59.7	64.9	
1992	171	1		2		23.6		65.4	
1992	171	1		3		27.2		69.5	
1992	171	1		4		24.2		66.1	
1992	171	1		5		24.4		65.2	
1992	171	1		6		23.9		65.8	
1992	171	1	4	1	20.0	24.2	62.1	68.9	
1992	171	1		2		24.4		69.1	
1992	171	1		3		25.7		70.4	
1992	171	1		4		24.6		69.0	
1992	171	1		5		24.1		67.7	
1992	171	1		6		23.3		67.0	

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YEAR	JDATE	HARV #	SDATE	SAMP	WT 1	WT 2
1991	295	1	15	10	60.0	60.1
1991	309	1	29	10	55.2	55.3
1991	323	1	43	10	78.4	78.3
1991	337	1	57	10	88.5	88.5
1991	351	1	71	10	195.3	195.3
1992	14	1	99	10	100.2	100.3
1992	42	1	127	10	79.6	79.6
1992	70	1	155	10	120.8	120.7
1992	98	1	183	10	76.4	76.4
1991	354	2	1	29	114.4	114.4
1992	3	2	15	29	139.2	139.3
1992	17	2	29	29	57.2	57.2
1992	31	2	43	29	110.0	110.1
1992	45	2	57	29	140.5	140.5
1992	59	2	71	29	120.0	120.2
1992	87	2	99	29	131.9	131.8
1992	115	2	127	29	108.4	108.4
1992	143	2	155	29	121.2	121.3
1992	171	2	183	29	117.8	117.9

YEAR	JDATE	HARV #	REP	SAMPLE	TEMP	COLD	HOT	
						READING	TEMP	READING
1991	352	2	5	1	22.2	23.8	63.8	67.2
1991	352	2	bale 22	2		24.1		67.8
1991	352	2		3		27.1		70.1
1991	352	2		4		24.5		68.2
1991	352	2		5		24.0		67.2
1991	352	2		6		23.9		66.8
1991	352	2	6	1	22.7	24.5	63.9	67.1
1991	352	2		2		24.8		67.2
1991	352	2	bale 23	3		27.4		70.0
1991	352	2		4		24.9		68.7
1991	352	2		5		25.1		68.2
1991	352	2		6		25.4		68.0
1991	352	2	7	1	21.9	24.1	60.5	65.4
1991	352	2		2		23.8		65.6
1991	352	2	bale 26	3		27.0		68.3
1991	352	2		4		24.3		66.7
1991	352	2		5		24.0		65.8
1991	352	2		6		23.3		64.8
1991	352	2	8	1	22.0	24.5	58.8	62.8
1991	352	2		2		24.6		63.9
1991	352	2	bale 27	3		26.3		65.1
1991	352	2		4		23.5		62.0
1991	352	2		5		24.3		62.5
1991	352	2		6		24.2		62.4
1992	171	2	5	1	20.2	23.0	61.2	66.7
1992	171	2		2		23.8		67.4
1992	171	2	22	3		25.9		68.5
1992	171	2		4		24.5		68.0
1992	171	2		5		23.7		66.2
1992	171	2		6		24.4		67.1
1992	171	2	6	1	19.9	24.4	60.8	67.4
1992	171	2		2		24.6		66.2
1992	171	2	23	3		26.1		68.9
1992	171	2		4		24.2		66.9
1992	171	2		5		24.0		67.4
1992	171	2		6		24.6		67.2
1992	171	2	7	1	20.0	24.1	60.6	67.5
1992	171	2		2		24.6		67.1
1992	171	2	26	3		25.6		68.3
1992	171	2		4		24.1		67.2
1992	171	2		5		24.3		66.7
1992	171	2		6		23.4		65.4
1992	171	2	8	1	20.0	23.2	62.4	68.7
1992	171	2		2		24.6		68.9
1992	171	2	27	3		25.9		69.1
1992	171	2		4		24.0		67.4
1992	171	2		5		24.9		69.2
1992	171	2		6		23.7		68.5

BUDGET EXTENSION

SUBCONTRACT NO. HW-1-11176-1

Additional 4 days consulting D.I. Bransby @ \$300/day	\$1,200
Technical help 32 hours @ \$12/hr	384
Chain Saw and accesssories	210
Packaging costs (boxes, bags, etc.)	<u>154</u>
Total	<u>1,948</u>
Original Budget	11,619
Grand Total	<u>\$13,567</u>