TECHNICAL DOCUMENTATION REPORT

Intermountain Forest Tree
Nutrition Cooperative

July, 1998

Ponderosa Pine Response to Nitrogen or
Nitrogen Plus Potassium Fertilization

College of Forestry, Wildlife and Range Sciences
University of Idaho
Moscow, Idaho 83844

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Section I

PONDEROSA PINE RESULTS

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Table 1. Twelve-year gross basal area growth for ponderosa pine installations in northeast Oregon and central Washington.

Dependent Variable: GBAI12 12 YEAR GROSS BA GROWTH (SQ.FT/A)

Source	DF	Sum of Squares	Mean Square	F Value	Pr > F
Model	15	10603.761965	706.917464	14.30	0.0001
Error	38	1877.961246	49.420033		
Corrected Total	53	12481.723212			

R-Square	C.V.	Root MSE	GBAI12 Mean
0.849543	15.22038	7.0299383	46.187668

Source	DF	Type I SS	Mean Square	F Value	Pr > F
REGION	1	2955.4871428	2955.4871428	59.80	0.0001
INSTALL(REGION)	7	6752.3034339	964.6147763	19.52	0.0001
TREAT	2	197.9418710	98.9709355	2.00	0.1490
REGION*TREAT	2	394.5311683	197.2655842	3.99	0.0267
BA0	1	273.6102534	273.6102534	5.54	0.0239
BA0*TREAT	2	29.8880959	14.9440480	0.30	0.7408

Source	DF	Type III SS	Mean Square	F Value	Pr > F
REGION	1	320.6992369	320.6992369	6.49	0.0150
INSTALL(REGION)	7	5758.6582658	822.6654665	16.65	0.0001
TREAT	2	0.4052109	0.2026055	0.00	0.9959
REGION*TREAT	2	138.7684849	69.3842424	1.40	0.2581
BA0	1	276.8336914	276.8336914	5.60	0.0231
BA0*TREAT	2	29.8880959	14.9440480	0.30	0.7408

Parameter		Estimate		T for H0: Parameter=0	Pr > |T|	Std Error of Estimate
INTERCEPT		23.74652168	B	1.28	0.2083	18.55378142
REGION	4	1.84439309	B	0.19	0.8515	9.78287685
	5	0.00000000	B	.	.	.
INSTALL(REGION)	291 4	-11.98540124	B	-2.21	0.0329	5.41406575
	292 4	-19.36753822	B	-4.74	0.0001	4.08975857
	293 4	-2.59048233	B	-0.54	0.5946	4.82707546
	294 4	-12.40580911	B	-2.90	0.0062	4.28052769
	295 4	0.00000000	B	.	.	.
	296 5	29.92623678	B	2.78	0.0084	10.76698296
	298 5	-7.50126005	B	-0.68	0.4989	10.98754488
	299 5	1.80498331	B	0.32	0.7491	5.60231044
	300 5	0.00000000	B	.	.	.
TREAT	0	-4.39644984	B	-0.50	0.6217	8.83800845
	1	-4.07976867	B	-0.45	0.6585	9.15812453
	2	0.00000000	B	.	.	.
REGION*TREAT	4 0	8.40172051	B	1.59	0.1198	5.27949106
	4 1	6.78673990	B	1.30	0.2024	5.23248140
	4 2	0.00000000	B	.	.	.
	5 0	0.00000000	B	.	.	.
	5 1	0.00000000	B	.	.	.
	5 2	0.00000000	B	.	.	.
BA0		0.20707075	B	2.40	0.0214	0.08625104
BA0*TREAT	0	-0.03844304	B	-0.67	0.5059	0.05724258
	1	0.00091171	B	0.02	0.9879	0.05950412
	2	0.00000000	B	.	.	.

Table 2. Twelve-year net basal area growth for ponderosa pine installations in northeast Oregon and central Washington.

Dependent Variable: NBAI12 12 YEAR NET BA GROWTH (SQ.FT/A)

Source	DF	Sum of Squares	Mean Square	F Value	Pr > F
Model	15	16338.176792	1089.211786	2.34	0.0172
Error	38	17662.432733	464.800861		
Corrected Total	53	34000.609525			

R-Square	C.V.	Root MSE	NBAI12 Mean
0.480526	56.88498	21.559241	37.899708

Source	DF	Type I SS	Mean Square	F Value	Pr > F
REGION	1	6918.3279776	6918.3279776	14.88	0.0004
INSTALL(REGION)	7	5987.5423319	855.3631903	1.84	0.1076
TREAT	2	401.7832032	200.8916016	0.43	0.6522
REGION*TREAT	2	2335.9521749	1167.9760874	2.51	0.0944
BA0	1	673.8801552	673.8801552	1.45	0.2360
BA0*TREAT	2	20.6909488	10.3454744	0.02	0.9780

Source	DF	Type III SS	Mean Square	F Value	Pr > F
REGION	1	735.9727604	735.9727604	1.58	0.2159
INSTALL(REGION)	7	6238.1864975	891.1694996	1.92	0.0937
TREAT	2	51.9641822	25.9820911	0.06	0.9457
REGION*TREAT	2	1267.0425801	633.5212901	1.36	0.2681
BA0	1	676.2853910	676.2853910	1.46	0.2352
BA0*TREAT	2	20.6909488	10.3454744	0.02	0.9780

Parameter		Estimate	T for H0: Parameter=0	Pr > |T|	Std Error of Estimate
INTERCEPT		-1.98835803 B	-0.03	0.9723	56.90027737
REGION	4	-20.71831559 B	-0.69	0.4940	30.00188445
	5	0.00000000 B	.	.	.
INSTALL(REGION)	291 4	18.56952982 B	1.12	0.2704	16.60372276
	292 4	-2.58419145 B	-0.21	0.8379	12.54237031
	293 4	17.13837433 B	1.16	0.2542	14.80355548
	294 4	-2.96336850 B	-0.23	0.8226	13.12741632
	295 4	0.00000000 B	.	.	.
	296 5	45.67923212 B	1.38	0.1746	33.01991668
	298 5	5.82892609 B	0.17	0.8636	33.69633051
	299 5	2.91749357 B	0.17	0.8661	17.18102692
	300 5	0.00000000 B	.	.	.
TREAT	0	-3.72039536 B	-0.14	0.8915	27.10418543
	1	-8.21156460 B	-0.29	0.7716	28.08590951
	2	0.00000000 B	.	.	.
REGION*TREAT	4 0	22.86994668 B	1.41	0.1659	16.19101243
	4 1	23.74128095 B	1.48	0.1473	16.04684439
	4 2	0.00000000 B	.	.	.
	5 0	0.00000000 B	.	.	.
	5 1	0.00000000 B	.	.	.
	5 2	0.00000000 B	.	.	.
BA0		0.31241520 B	1.18	0.2449	0.26451257
BA0*TREAT	0	-0.02981448 B	-0.17	0.8660	0.17555013
	1	0.00485493 B	0.03	0.9789	0.18248575
	2	0.00000000 B	.	.	.

Table 3. Twelve-year gross volume for ponderosa pine installations in northeast Oregon and central Washington.

Dependent Variable: GVI12 12 YEAR GROSS VOLUME GROWTH (CU.FT/A)

Source	DF	Sum of Squares	Mean Square	F Value	Pr > F
Model	15	35302681.220	2353512.081	35.96	0.0001
Error	38	2486768.726	65441.282		
Corrected Total	53	37789449.946			

R-Square	C.V.	Root MSE	GVI12 Mean
0.934194	11.96390	255.81494	2138.2236

Source	DF	Type I SS	Mean Square	F Value	Pr > F
REGION	1	8911584.964	8911584.964	136.18	0.0001
INSTALL(REGION)	7	22682582.375	3240368.911	49.52	0.0001
TREAT	2	41978.689	20989.345	0.32	0.7276
REGION*TREAT	2	1282182.110	641091.055	9.80	0.0004
BA0	1	2170771.558	2170771.558	33.17	0.0001
BA0*TREAT	2	213581.525	106790.762	1.63	0.2090

Source	DF	Type III SS	Mean Square	F Value	Pr > F
REGION	1	260181.4164	260181.4164	3.98	0.0534
INSTALL(REGION)	7	5322007.2741	760286.7534	11.62	0.0001
TREAT	2	110985.6956	55492.8478	0.85	0.4362
REGION*TREAT	2	241423.6998	120711.8499	1.84	0.1720
BA0	1	2224610.7923	2224610.7923	33.99	0.0001
BA0*TREAT	2	213581.5246	106790.7623	1.63	0.2090

Parameter		Estimate		T for H0: Parameter=0	Pr > |T|	Std Error of Estimate
INTERCEPT		11.9808177	B	0.02	0.9859	675.1601818
REGION	4	-396.6824824	B	-1.11	0.2721	355.9926014
	5	0.0000000	B	.	.	.
INSTALL(REGION)	291 4	348.5154707	B	1.77	0.0849	197.0143731
	292 4	-46.7574875	B	-0.31	0.7551	148.8236861
	293 4	122.0730382	B	0.69	0.4913	175.6541737
	294 4	286.5018470	B	1.84	0.0737	155.7656518
	295 4	0.0000000	B	.	.	.
	296 5	953.3010316	B	2.43	0.0198	391.8035901
	298 5	-278.3525151	B	-0.70	0.4906	399.8296966
	299 5	32.7453647	B	0.16	0.8732	203.8644765
	300 5	0.0000000	B	.	.	.
TREAT	0	50.2807388	B	0.16	0.8766	321.6094475
	1	-226.9539990	B	-0.68	0.5000	333.2582660
	2	0.0000000	B	.	.	.
REGION*TREAT	4 0	368.8056056	B	1.92	0.0624	192.1172866
	4 1	206.3157394	B	1.08	0.2854	190.4066355
	4 2	0.0000000	B	.	.	.
	5 0	0.0000000	B	.	.	.
	5 1	0.0000000	B	.	.	.
	5 2	0.0000000	B	.	.	.
BA0		18.0735581	B	5.76	0.0001	3.1386201
BA0*TREAT	0	-2.7850071	B	-1.34	0.1892	2.0830207
	1	0.8873825	B	0.41	0.6842	2.1653165
	2	0.0000000	B	.	.	.

Table 4. Twelve-year net volume growth for ponderosa pine installations in northeast Oregon and central Washington.

Dependent Variable: NVI12 12 YEAR NET VOLUME GROWTH (CU.FT/A)

Source	DF	Sum of Squares	Mean Square	F Value	Pr > F
Model	15	40426212.428	2695080.829	7.16	0.0001
Error	38	14294405.813	376168.574		
Corrected Total	53	54720618.241			

R-Square	C.V.	Root MSE	NVI12 Mean
0.738775	32.06216	613.32583	1912.9272

Source	DF	Type I SS	Mean Square	F Value	Pr > F
REGION	1	14402497.063	14402497.063	38.29	0.0001
INSTALL(REGION)	7	19584030.529	2797718.647	7.44	0.0001
TREAT	2	191889.104	95944.552	0.26	0.7762
REGION*TREAT	2	2725054.713	1362527.357	3.62	0.0363
BA0	1	3353068.912	3353068.912	8.91	0.0049
BA0*TREAT	2	169672.106	84836.053	0.23	0.7992

Source	DF	Type III SS	Mean Square	F Value	Pr > F
REGION	1	485317.7685	485317.7685	1.29	0.2631
INSTALL(REGION)	7	7681925.6780	1097417.9540	2.92	0.0152
TREAT	2	194147.9066	97073.9533	0.26	0.7739
REGION*TREAT	2	812937.9927	406468.9964	1.08	0.3496
BA0	1	3404405.1830	3404405.1830	9.05	0.0046
BA0*TREAT	2	169672.1061	84836.0531	0.23	0.7992

Parameter		Estimate	T for H0: Parameter=0	Pr > |T|	Std Error of Estimate
INTERCEPT		-922.803243 B	-0.57	0.5720	1618.721655
REGION	4	-639.515173 B	-0.75	0.4583	853.505506
	5	0.000000 B	.	.	.
INSTALL(REGION)	291 4	1049.935563 B	2.22	0.0323	472.349289
	292 4	87.953239 B	0.25	0.8066	356.810324
	293 4	610.507292 B	1.45	0.1554	421.137417
	294 4	197.049092 B	0.53	0.6008	373.453945
	295 4	0.000000 B	.	.	.
	296 5	1533.006307 B	1.63	0.1109	939.363684
	298 5	243.642653 B	0.25	0.8007	958.606573
	299 5	95.515361 B	0.20	0.8461	488.772667
	300 5	0.000000 B	.	.	.
TREAT	0	52.823459 B	0.07	0.9457	771.070616
	1	-352.375772 B	-0.44	0.6617	798.999092
	2	0.000000 B	.	.	.
REGION*TREAT	4 0	629.946937 B	1.37	0.1795	460.608342
	4 1	542.793482 B	1.19	0.2418	456.506993
	4 2	0.000000 B	.	.	.
	5 0	0.000000 B	.	.	.
	5 1	0.000000 B	.	.	.
	5 2	0.000000 B	.	.	.
BA0		22.069909 B	2.93	0.0057	7.524958
BA0*TREAT	0	-2.397714 B	-0.48	0.6339	4.994120
	1	0.915161 B	0.18	0.8610	5.191427
	2	0.000000 B	.	.	.

Table 5. Ten-year gross basal area growth for ponderosa pine installations in Montana.

Dependent Variable: GBAI10 10 YEAR GROSS BA GROWTH (SQ.FT/A)

Source	DF	Sum of Squares	Mean Square	F Value	Pr > F
Model	16	2167.4777060	135.4673566	6.66	0.0001
Error	19	386.6444061	20.3497056		
Corrected Total	35	2554.1221122			

R-Square	C.V.	Root MSE	GBAI10 Mean
0.848619	13.76899	4.5110648	32.762501

Source	DF	Type I SS	Mean Square	F Value	Pr > F
INSTALL	5	1842.8742709	368.5748542	18.11	0.0001
BLOCK(INSTALL)	6	187.1881047	31.1980175	1.53	0.2210
TREAT	2	71.1259529	35.5629765	1.75	0.2011
BA0	1	38.1838995	38.1838995	1.88	0.1867
BA0*TREAT	2	28.1054780	14.0527390	0.69	0.5134

Source	DF	Type III SS	Mean Square	F Value	Pr > F
INSTALL	5	1831.1660604	366.2332121	18.00	0.0001
BLOCK(INSTALL)	6	231.0226002	38.5037667	1.89	0.1346
TREAT	2	22.6869185	11.3434593	0.56	0.5818
BA0	1	62.9459795	62.9459795	3.09	0.0947
BA0*TREAT	2	28.1054780	14.0527390	0.69	0.5134

Parameter		Estimate	T for H0: Parameter=0	Pr > |T|	Std Error of Estimate
INTERCEPT		25.17803580	2.32	0.0313	10.82997153
INSTALL	301	-4.89738670	-0.99	0.3331	4.93111573
	302	-17.42620971	-4.56	0.0002	3.82217095
	303	-9.66972191	-2.56	0.0193	3.78296887
	304	-4.77092951	-1.16	0.2592	4.10161431
	305	-4.34147754	-1.03	0.3170	4.22413537
	306	0.00000000	.	.	.
BLOCK(INSTALL)	1 301	6.53580812	1.74	0.0972	3.74592146
	2 301	0.00000000	.	.	.
	1 302	-4.70938369	-1.16	0.2621	4.07449992
	2 302	0.00000000	.	.	.
	1 303	-4.61187140	-1.24	0.2302	3.72003077
	2 303	0.00000000	.	.	.
	1 304	-2.82341068	-0.69	0.4985	4.09179679
	2 304	0.00000000	.	.	.
	1 305	3.35445455	0.91	0.3744	3.68767271
	2 305	0.00000000	.	.	.
	1 306	8.16931713	2.18	0.0419	3.74470362
	2 306	0.00000000	.	.	.
TREAT	0	-3.46980902	-0.32	0.7524	10.84246670
	1	6.52408852	0.70	0.4903	9.27376420
	8	0.00000000	.	.	.
BA0		0.13528449	1.65	0.1156	0.08203893
BA0*TREAT	0	0.00077734	0.01	0.9933	0.09188133
	1	-0.07762186	-1.01	0.3260	0.07699368
	8	0.00000000	.	.	.

Table 6. Ten-year net basal area growth for ponderosa pine installations in Montana.

Dependent Variable: NBAI10 10 YEAR NET BA GROWTH (SQ.FT/A)

Source	DF	Sum of Squares	Square	F Value	Pr > F
Model	16	3108.0692766	194.2543298	1.86	0.0992
Error	19	1987.9647104	104.6297216		
Corrected Total	35	5096.0339870			

R-Square	C.V.	Root MSE	NBAI10 Mean
0.609900	35.49899	10.228867	28.814533

Source	DF	Type I SS	Mean Square	F Value	Pr > F
INSTALL	5	2159.8541252	431.9708250	4.13	0.0105
BLOCK(INSTALL)	6	608.7847276	101.4641213	0.97	0.4717
TREAT	2	294.0758461	147.0379230	1.41	0.2697
BA0	1	28.4530218	28.4530218	0.27	0.6081
BA0*TREAT	2	16.9015558	8.4507779	0.08	0.9227

Source	DF	Type III SS	Mean Square	F Value	Pr > F
INSTALL	5	1935.7375085	387.1475017	3.70	0.0166
BLOCK(INSTALL)	6	575.1144197	95.8524033	0.92	0.5048
TREAT	2	31.0155983	15.5077991	0.15	0.8632
BA0	1	27.6021646	27.6021646	0.26	0.6134
BA0*TREAT	2	16.9015558	8.4507779	0.08	0.9227

Parameter		Estimate	T for H0: Parameter=0	Pr > |T|	Std Error of Estimate
INTERCEPT		29.22740693	1.19	0.2486	24.55702682
INSTALL	301	2.62250518	0.23	0.8171	11.18133515
	302	-13.93629683	-1.61	0.1243	8.66679606
	303	-6.85765097	-0.80	0.4339	8.57790509
	304	2.24296007	0.24	0.8120	9.30043559
	305	-3.20769102	-0.33	0.7414	9.57825283
	306	0.00000000	.	.	.
BLOCK(INSTALL)	1 301	2.77426152	0.33	0.7475	8.49389987
	2 301	0.00000000	.	.	.
	1 302	-0.36802168	-0.04	0.9686	9.23895355
	2 302	0.00000000	.	.	.
	1 303	-9.40426464	-1.11	0.2788	8.43519258
	2 303	0.00000000	.	.	.
	1 304	-1.40231260	-0.15	0.8815	9.27817429
	2 304	0.00000000	.	.	.
	1 305	6.42929735	0.77	0.4514	8.36182048
	2 305	0.00000000	.	.	.
	1 306	16.01920262	1.89	0.0746	8.49113841
	2 306	0.00000000	.	.	.
TREAT	0	-10.32602718	-0.42	0.6792	24.58535969
	1	-10.76496093	-0.51	0.6146	21.02831718
	8	0.00000000	.	.	.
BA0		0.03371179	0.18	0.8581	0.18602377
BA0*TREAT	0	0.08366290	0.40	0.6925	0.20834147
	1	0.03307066	0.19	0.8518	0.17458364
	8	0.00000000	.	.	.

Table 7. Ten-Year gross volume growth for ponderosa pine installations in Montana.

Dependent Variable: GVI10 10 YEAR GROSS VOLUME GROWTH (CU.FT/A)

Source	DF	Sum of Squares	Mean Square	F Value	Pr > F
Model	16	7552490.9569	472030.6848	10.43	0.0001
Error	19	859694.5955	45247.0840		
Corrected Total	35	8412185.5524			

R-Square	C.V.	Root MSE	GVI10 Mean
0.897804	12.92925	212.71362	1645.2123

Source	DF	Type I SS	Mean Square	F Value	Pr > F
INSTALL	5	5754079.3018	1150815.8604	25.43	0.0001
BLOCK(INSTALL)	6	758249.1647	126374.8608	2.79	0.0404
TREAT	2	188359.8955	94179.9477	2.08	0.1523
BA0	1	839376.9408	839376.9408	18.55	0.0004
BA0*TREAT	2	12425.6541	6212.8271	0.14	0.8726

Source	DF	Type III SS	Mean Square	F Value	Pr > F
INSTALL	5	3686935.0365	737387.0073	16.30	0.0001
BLOCK(INSTALL)	6	389678.3913	64946.3986	1.44	0.2529
TREAT	2	2366.9189	1183.4595	0.03	0.9742
BA0	1	535884.6597	535884.6597	11.84	0.0027
BA0*TREAT	2	12425.6541	6212.8271	0.14	0.8726

Parameter		Estimate		T for H0: Parameter=0	Pr > |T|	Std Error of Estimate
INTERCEPT		781.195082	B	1.53	0.1426	510.6737652
INSTALL	301	-524.479292	B	-2.26	0.0361	232.5205964
	302	-1095.065692	B	-6.08	0.0001	180.2296919
	303	-260.853149	B	-1.46	0.1600	178.3811665
	304	-427.569307	B	-2.21	0.0395	193.4064939
	305	-289.557305	B	-1.45	0.1623	199.1838211
	306	0.000000	B	.	.	.
BLOCK(INSTALL)	1 301	167.340929	B	0.95	0.3553	176.6342423
	2 301	0.000000	B	.	.	.
	1 302	235.051470	B	1.22	0.2361	192.1279489
	2 302	0.000000	B	.	.	.
	1 303	-331.451163	B	-1.89	0.0742	175.4133995
	2 303	0.000000	B	.	.	.
	1 304	81.241577	B	0.42	0.6784	192.9435610
	2 304	0.000000	B	.	.	.
	1 305	103.851578	B	0.60	0.5574	173.8875956
	2 305	0.000000	B	.	.	.
	1 306	252.478675	B	1.43	0.1690	176.5768167
	2 306	0.000000	B	.	.	.
TREAT	0	113.833582	B	0.22	0.8262	511.2629593
	1	29.830706	B	0.07	0.9463	437.2927548
	8	0.000000	B	.	.	.
BA0		11.208239	B	2.90	0.0092	3.8684429
BA0*TREAT	0	-2.269998	B	-0.52	0.6064	4.3325490
	1	-0.997682	B	-0.27	0.7864	3.6305407
	8	0.000000	B	.	.	.

Table 8. Ten-year volume growth for ponderosa pine installations in Montana.

Dependent Variable: NVI10 10 YEAR NET VOLUME GROWTH (CU.FT/A)

Source	DF	Sum of Squares	Mean Square	F Value	Pr > F
Model	16	7161721.8038	447607.6127	2.98	0.0127
Error	19	2857943.1783	150418.0620		
Corrected Total	35	10019664.9821			

R-Square	C.V.	Root MSE	NVI10 Mean
0.714767	25.25280	387.83767	1535.8205

Source	DF	Type I SS	Mean Square	F Value	Pr > F
INSTALL	5	4971697.0768	994339.4154	6.61	0.0010
BLOCK(INSTALL)	6	1417254.8108	236209.1351	1.57	0.2099
TREAT	2	60942.6639	30471.3319	0.20	0.8184
BA0	1	691500.2662	691500.2662	4.60	0.0452
BA0*TREAT	2	20326.9861	10163.4930	0.07	0.9349

Source	DF	Type III SS	Mean Square	F Value	Pr > F
INSTALL	5	3302384.3380	660476.8676	4.39	0.0080
BLOCK(INSTALL)	6	956308.4169	159384.7362	1.06	0.4199
TREAT	2	52900.9376	26450.4688	0.18	0.8401
BA0	1	387885.7095	387885.7095	2.58	0.1248
BA0*TREAT	2	20326.9861	10163.4930	0.07	0.9349

Parameter		Estimate		T for H0: Parameter=0	Pr > |T|	Std Error of Estimate
INTERCEPT		970.5018722	B	1.04	0.3103	931.1041110
INSTALL	301	-308.2560782	B	-0.73	0.4760	423.9514499
	302	-927.5862420	B	-2.82	0.0109	328.6101978
	303	-192.5406654	B	-0.59	0.5608	325.2398082
	304	-206.4065738	B	-0.59	0.5652	352.6352710
	305	-222.0691255	B	-0.61	0.5481	363.1689884
	306	0.0000000	B	.	.	.
BLOCK(INSTALL)	1 301	83.0257596	B	0.26	0.7993	322.0546665
	2 301	0.0000000	B	.	.	.
	1 302	324.1970605	B	0.93	0.3663	350.3041184
	2 302	0.0000000	B	.	.	.
	1 303	-492.8436328	B	-1.54	0.1398	319.8287214
	2 303	0.0000000	B	.	.	.
	1 304	136.7625798	B	0.39	0.7018	351.7912120
	2 304	0.0000000	B	.	.	.
	1 305	196.2604431	B	0.62	0.5433	317.0467452
	2 305	0.0000000	B	.	.	.
	1 306	505.7724987	B	1.57	0.1327	321.9499633
	2 306	0.0000000	B	.	.	.
TREAT	0	-188.4518189	B	-0.20	0.8419	932.1783800
	1	-464.6966694	B	-0.58	0.5669	797.3095731
	8	0.0000000	B	.	.	.
BA0		7.4231059	B	1.05	0.3058	7.0532762
BA0*TREAT	0	1.1441500	B	0.14	0.8864	7.8994741
	1	2.4136300	B	0.36	0.7194	6.6195126
	8	0.0000000	B	.	.	.

Section II

SUMMARY CHARACTERISTICS FOR ALL OF THE PONDEROSA PINE INSTALLATIONS

Installation 291 SARDINE SPRINGS
Region: Northeast Oregon Ownership: Forest Service
Legal Description: T7S R42E Section 4 Meridian: Willamette

	Plot Number					
	1	2	3	4	5	6
Treatment	200#N	None	400#N	400#N	None	200#N
Mensurational Characteristics:						
At Time of Treatment (1985)	Stand Total Age = 83					
Live Trees per Acre	80	75	65	65	70	70
Live Basal Area (sq.ft/a)	79.7	75.3	72.1	79.2	83.2	71.4
Live Total Volume (cu.ft/a)	2453	2242	2214	2844	2716	2397
Crown Competition Factor	62	58	55	60	63	55
Relative Density Index	21.7	20.4	19.1	20.5	21.7	19.3
Site Height (ft)	73.7	71.3	74.3	83.7	76.6	77.0
Mean Diameter (in)	13.5	13.6	14.3	14.9	14.8	13.7
Average Crown Ratio (%)	51	53	52	48	52	42
Average Crown Length (ft)	34.6	35.8	35.8	38.7	37.7	31.1
Species Composition (% of BA)						
Ponderosa Pine	100.0	100.0	100.0	100.0	100.0	100.0
2 Years After Treatment (1987)						
Live Trees per Acre	80	75	65	65	70	70
Live Basal Area (sq.ft/a)	87.6	83.0	79.2	88.3	91.1	77.9
Live Total Volume (cu.ft/a)	2773	2548	2497	3276	3057	2672
Crown Competition Factor	67	63	60	65	68	59
Relative Density Index	23.3	22.0	20.5	22.2	23.2	20.6
Site Height (ft)	75.4	73.1	75.8	86.1	78.3	78.7
Mean Diameter (in)	14.2	14.2	14.9	15.8	15.4	14.3
Average Height Growth (ft)	1.9	1.9	1.7	2.3	1.8	1.6
Dead Trees per Acre	0	0	0	0	0	0
Dead Basal Area (sq.ft/a)	0.0	0.0	0.0	0.0	0.0	0.0
Dead Total Volume (cu.ft/a)	0	0	0	0	0	0
Topkill Volume (cu.ft/a)	0.0	0.0	0.0	0.0	0.0	0.0
4 Years After Treatment (1989)						
Live Trees per Acre	80	75	65	65	70	70
Live Basal Area (sq.ft/a)	92.5	88.6	83.5	93.5	96.5	82.3
Live Total Volume (cu.ft/a)	2986	2800	2710	3552	3335	2888
Crown Competition Factor	70	67	62	69	72	62
Relative Density Index	24.2	23.1	21.3	23.2	24.2	21.5
Site Height (ft)	76.5	75.0	70.0	85.9	80.5	81.8
Mean Diameter (in)	14.6	14.7	15.4	16.2	15.9	14.7
Average Height Growth (ft)	3.4	3.7	3.6	4.3	3.9	3.2
Average Crown Ratio (%)	59	61	61	54	57	48
Average Crown Length (ft)	41.9	42.9	43.9	46.2	43.6	37.0
Dead Trees per Acre	0	0	0	0	0	0
Dead Basal Area (sq.ft/a)	0.0	0.0	0.0	0.0	0.0	0.0
Dead Total Volume (cu.ft/a)	0	0	0	0	0	0
Topkill Volume (cu.ft/a)	0.0	0.0	0.0	0.0	0.0	0.0
6 Years After Treatment (1991)						
Live Trees per Acre	80	75	65	65	70	70
Live Basal Area (sq.ft/a)	97.1	93.1	86.7	98.7	101.4	86.2
Crown Competition Factor	73	70	64	72	75	64
Relative Density Index	25.1	24.0	21.9	24.2	25.1	22.2
Mean Diameter (in)	14.9	15.1	15.6	16.7	16.3	15.0
Dead Trees per Acre	0	0	0	0	0	0
Dead Basal Area (sq.ft/a)	0.0	0.0	0.0	0.0	0.0	0.0
12 Years After Treatment (1997)						
Live Trees per Acre	80	75	65	65	70	70
Live Basal Area (sq.ft/a)	111.9	108.1	96.3	114.0	115.5	99.7
Live Total Projected Volume (cu.ft/a)	3850	3689	3294	4635	4285	3718
Crown Competition Factor	82	79	70	81	83	72
Relative Density Index	28.0	26.8	23.7	26.9	27.7	24.8
Site Height (ft)	81.0	79.9	74.0	91.3	85.7	86.5
Mean Diameter (in)	16.0	16.3	16.5	17.9	17.4	16.2
Average Projected Height Growth (ft)	7.9	8.6	7.3	9.8	8.9	7.8
Average Crown Ratio (%)	54	52	53	46	49	40
Average Crown Length (ft)	40.4	42.3	35.6	40.8	36.0	30.1
Dead Trees per Acre	0	0	0	0	0	0
Dead Basal Area (sq.ft/a)	0.0	0.0	0.0	0.0	0.0	0.0
Dead Total Volume (cu.ft/a)	0	0	0	0	0	0
Topkill Volume (cu.ft/a)	0.0	0.0	0.0	0.0	0.0	0.0

Installation 292 SPARTA BUTTE
Region: Northeast Oregon Ownership: Forest Service
Legal Description: T8S R44E Section 4 Meridian: Willamette

	Plot Number					
	1	2	3	4	5	6
Treatment	200#N	None	400#N	400#N	None	200#N
Mensurational Characteristics:						
At Time of Treatment (1985)	Stand Total Age = 88					
Live Trees per Acre	70	70	95	90	130	90
Live Basal Area (sq.ft/a)	108.1	141.0	136.0	90.1	140.4	101.5
Live Total Volume (cu.ft/a)	4502	6492	5183	2914	4965	3471
Crown Competition Factor	81	100	100	71	109	81
Relative Density Index	26.4	32.2	33.8	24.5	37.4	26.8
Site Height (ft)	98.7	104.1	92.8	77.0	88.9	83.4
Mean Diameter (in)	16.8	19.2	16.2	13.5	14.1	14.4
Average Crown Ratio (%)	47	46	53	48	51	50
Average Crown Length (ft)	43.7	47.9	43.6	35.5	37.6	38.2
Species Composition (% of BA)						
Douglas-fir	10.7	7.6	0.0	0.0	4.6	12.6
Ponderosa Pine	89.3	92.4	100.0	100.0	95.4	87.4
2 Years After Treatment (1987)						
Live Trees per Acre	70	70	95	90	130	90
Live Basal Area (sq.ft/a)	113.4	149.4	142.8	97.4	147.3	106.3
Live Total Volume (cu.ft/a)	4790	6995	5553	3246	5316	3707
Crown Competition Factor	85	105	104	75	114	84
Relative Density Index	27.3	33.6	35.1	26.0	38.8	27.7
Site Height (ft)	99.8	105.7	94.5	79.0	90.5	84.9
Mean Diameter (in)	17.2	19.8	16.6	14.1	14.4	14.7
Average Height Growth (ft)	1.3	1.8	1.7	1.8	1.5	1.4
Dead Trees per Acre	0	0	0	0	0	0
Dead Basal Area (sq.ft/a)	0.0	0.0	0.0	0.0	0.0	0.0
Dead Total Volume (cu.ft/a)	0	0	0	0	0	0
Topkill Volume (cu.ft/a)	0.0	0.0	0.0	0.0	0.0	0.0
4 Years After Treatment (1989)						
Live Trees per Acre	60	70	95	90	125	80
Live Basal Area (sq.ft/a)	98.4	154.5	147.2	102.2	151.4	96.8
Live Total Volume (cu.ft/a)	4114	7335	5811	3482	5582	3424
Crown Competition Factor	74	108	107	78	117	77
Relative Density Index	23.6	34.4	35.9	26.9	39.2	25.1
Site Height (ft)	97.6	107.1	95.9	81.0	92.1	85.2
Mean Diameter (in)	17.3	20.1	16.9	14.4	14.9	14.9
Average Height Growth (ft)	3.0	3.3	2.9	3.9	3.0	3.2
Average Crown Ratio (%)	48	53	56	52	52	53
Average Crown Length (ft)	46.1	56.6	47.6	40.2	39.6	42.0
Dead Trees per Acre	10	0	0	0	5	10
Dead Basal Area (sq.ft/a)	18.4	0.0	0.0	0.0	1.0	12.4
Dead Total Volume (cu.ft/a)	864	0	0	0	16	443
Topkill Volume (cu.ft/a)	6.3	0.0	0.0	5.3	0.0	5.1
6 Years After Treatment (1991)						
Live Trees per Acre	60	70	95	90	125	80
Live Basal Area (sq.ft/a)	101.9	159.9	153.1	108.1	156.9	100.7
Crown Competition Factor	76	112	111	82	120	79
Relative Density Index	24.3	35.3	36.9	28.1	40.3	25.8
Mean Diameter (in)	17.6	20.5	17.2	14.8	15.2	15.2
Dead Trees per Acre	10	0	0	0	5	10
Dead Basal Area (sq.ft/a)	18.4	0.0	0.0	0.0	1.0	12.4
12 Years After Treatment (1997)						
Live Trees per Acre	55	65	95	90	125	75
Live Basal Area (sq.ft/a)	106.9	169.9	169.8	125.9	175.0	103.8
Live Total Projected Volume (cu.ft/a)	4727	8494	7140	4663	6872	3872
Crown Competition Factor	78	117	121	93	132	80
Relative Density Index	24.6	36.3	39.9	31.5	43.7	26.0
Site Height (ft)	103.1	112.9	101.6	87.7	97.5	88.9
Mean Diameter (in)	18.9	21.9	18.1	16.0	16.0	15.9
Average Projected Height Growth (ft)	8.4	9.2	8.7	10.8	8.6	9.2
Average Crown Ratio (%)	38	51	51	59	45	48
Average Crown Length (ft)	38.6	59.1	47.4	50.5	39.8	40.1
Dead Trees per Acre	15	5	0	0	5	15
Dead Basal Area (sq.ft/a)	23.8	9.3	0.0	0.0	1.0	20.2
Dead Total Volume (cu.ft/a)	1074	449	0	0	16	769
Topkill Volume (cu.ft/a)	6.5	0.0	0.0	7.1	0.0	5.8

Installation 293 SUMMIT SALVAGE
Region: Northeast Oregon Ownership: Forest Service
Legal Description: T5S R41E Section 27 Meridian: Willamette

	Plot Number					
	1	2	3	4	5	6
Treatment	200#N	None	400#N	200#N	None	400#N
Mensurational Characteristics:						
At Time of Treatment (1985)	Stand Total Age = 47					
Live Trees per Acre	190	160	210	150	160	190
Live Basal Area (sq.ft/a)	95.9	101.2	88.4	87.9	82.1	75.5
Live Total Volume (cu.ft/a)	1895	2273	1661	1565	1468	1271
Crown Competition Factor	84	81	79	74	70	66
Relative Density Index	30.9	30.8	29.8	27.3	26.4	25.9
Site Height (ft)	51.8	59.6	52.6	48.4	49.5	47.0
Mean Diameter (in)	9.6	10.8	8.8	10.4	9.7	8.5
Average Crown Ratio (%)	57	58	56	65	64	58
Average Crown Length (ft)	26.1	25.6	23.7	26.8	27.2	22.9
Species Composition (% of BA)						
Douglas-fir	4.7	0.0	18.8	0.0	0.0	0.0
Ponderosa Pine	95.3	100.0	81.2	100.0	100.0	100.0
2 Years After Treatment (1987)						
Live Trees per Acre	190	160	210	150	160	190
Live Basal Area (sq.ft/a)	105.6	107.7	98.2	97.4	89.3	86.2
Live Total Volume (cu.ft/a)	2197	2522	1906	1832	1695	1541
Crown Competition Factor	90	86	87	81	76	74
Relative Density Index	33.2	32.3	32.3	29.5	28.1	28.5
Site Height (ft)	54.2	62.0	54.6	50.8	52.0	49.8
Mean Diameter (in)	10.1	11.1	9.3	10.9	10.1	9.1
Average Height Growth (ft)	2.1	1.5	1.6	2.1	2.4	2.3
Dead Trees per Acre	0	0	0	0	0	0
Dead Basal Area (sq.ft/a)	0.0	0.0	0.0	0.0	0.0	0.0
Dead Total Volume (cu.ft/a)	0	0	0	0	0	0
Topkill Volume (cu.ft/a)	0.0	0.0	0.0	0.0	0.0	0.0
4 Years After Treatment (1989)						
Live Trees per Acre	190	150	190	150	160	190
Live Basal Area (sq.ft/a)	114.5	108.1	102.2	104.4	95.7	96.3
Live Total Volume (cu.ft/a)	2485	2650	2072	2054	1914	1799
Crown Competition Factor	97	85	90	86	81	82
Relative Density Index	35.3	31.9	32.4	31.1	29.6	31.0
Site Height (ft)	55.8	63.7	54.2	53.0	54.6	51.5
Mean Diameter (in)	10.5	11.5	9.9	11.3	10.5	9.6
Average Height Growth (ft)	4.0	3.2	3.5	3.9	4.5	4.2
Average Crown Ratio (%)	59	55	60	62	62	63
Average Crown Length (ft)	29.3	25.9	27.0	28.1	29.2	27.3
Dead Trees per Acre	0	10	20	0	0	0
Dead Basal Area (sq.ft/a)	0.0	4.6	3.9	0.0	0.0	0.0
Dead Total Volume (cu.ft/a)	0	82	56	0	0	0
Topkill Volume (cu.ft/a)	0.0	0.0	0.0	0.0	0.0	0.0
6 Years After Treatment (1991)						
Live Trees per Acre	190	130	190	140	160	190
Live Basal Area (sq.ft/a)	122.8	109.3	110.8	106.9	101.7	106.1
Crown Competition Factor	103	84	97	87	86	90
Relative Density Index	37.2	31.0	34.5	31.1	30.9	33.4
Mean Diameter (in)	10.9	12.4	10.3	11.8	10.8	10.1
Dead Trees per Acre	0	30	20	10	0	0
Dead Basal Area (sq.ft/a)	0.0	9.1	3.9	4.8	0.0	0.0
12 Years After Treatment (1997)						
Live Trees per Acre	150	120	160	130	160	180
Live Basal Area (sq.ft/a)	126.0	122.9	113.1	121.3	119.8	125.1
Live Total Projected Volume (cu.ft/a)	3126	3589	2556	2806	2843	2696
Crown Competition Factor	103	92	98	95	99	103
Relative Density Index	35.8	33.2	33.5	33.5	35.0	37.2
Site Height (ft)	60.8	71.9	60.5	61.2	63.3	58.0
Mean Diameter (in)	12.4	13.7	11.4	13.1	11.7	11.3
Average Projected Height Growth (ft)	9.5	9.7	9.0	10.3	11.3	9.7
Average Crown Ratio (%)	50	57	44	31	50	45
Average Crown Length (ft)	28.7	29.8	20.1	19.4	28.1	21.9
Dead Trees per Acre	40	40	50	20	0	10
Dead Basal Area (sq.ft/a)	13.5	12.2	18.1	10.4	0.0	3.0
Dead Total Volume (cu.ft/a)	256	187	312	192	0	40
Topkill Volume (cu.ft/a)	0.0	0.0	0.0	0.0	0.0	0.0

Installation 294 MOSES CREEK
Region: Northeast Oregon
Legal Description: T3N R40E Section 30

Ownership: Boise Cascade
Meridian: Willamette

	Plot Number 1	2	3	4	5	6
Treatment	None	200#N	400#N	400#N	None	200#N
Mensurational Characteristics:						
At Time of Treatment (1985)	Stand Total Age = 81					
Live Trees per Acre	120	140	105	90	125	140
Live Basal Area (sq.ft/a)	129.4	135.2	126.3	130.2	150.6	148.0
Live Total Volume (cu.ft/a)	4747	4507	4813	4885	5508	5063
Crown Competition Factor	97	106	96	95	112	111
Relative Density Index	34.5	37.1	32.8	32.3	39.1	39.7
Site Height (ft)	89.9	87.7	93.4	88.3	88.2	85.3
Mean Diameter (in)	14.1	13.3	14.9	16.3	14.9	13.9
Average Crown Ratio (%)	53	58	52	46	44	49
Average Crown Length (ft)	34.0	40.6	40.8	37.7	34.8	34.4
Species Composition (% of BA)						
Douglas-fir	0.6	3.5	12.7	0.0	0.0	0.0
Grand Fir	0.6	0.0	0.0	0.0	0.0	0.0
Western Larch	0.0	16.0	1.4	0.0	0.0	0.0
Ponderosa Pine	98.8	80.6	85.9	100.0	100.0	100.0
2 Years After Treatment (1987)						
Live Trees per Acre	120	140	105	90	120	140
Live Basal Area (sq.ft/a)	136.3	145.6	135.0	134.5	157.2	158.6
Live Total Volume (cu.ft/a)	5141	4997	5296	5147	5970	5579
Crown Competition Factor	101	113	102	98	116	118
Relative Density Index	35.9	39.2	34.5	33.1	39.9	41.8
Site Height (ft)	92.5	90.1	96.2	89.3	91.3	87.5
Mean Diameter (in)	14.4	13.8	15.4	16.6	15.5	14.4
Average Height Growth (ft)	1.9	2.0	2.2	1.5	2.5	2.0
Dead Trees per Acre	0	0	0	0	5	0
Dead Basal Area (sq.ft/a)	0.0	0.0	0.0	0.0	0.8	0.0
Dead Total Volume (cu.ft/a)	0	0	0	0	16	0
Topkill Volume (cu.ft/a)	0.0	0.0	0.0	0.0	0.0	0.0
4 Years After Treatment (1989)						
Live Trees per Acre	115	135	95	65	120	140
Live Basal Area (sq.ft/a)	141.1	151.7	137.7	100.5	163.8	166.6
Live Total Volume (cu.ft/a)	5432	5366	5567	3939	6361	6001
Crown Competition Factor	104	117	103	73	120	123
Relative Density Index	36.4	40.0	34.1	24.5	41.2	43.3
Site Height (ft)	94.1	92.4	97.9	89.0	92.9	89.5
Mean Diameter (in)	15.0	14.4	16.3	16.8	15.8	14.8
Average Height Growth (ft)	3.6	4.1	4.2	4.0	4.3	3.7
Average Crown Ratio (%)	54	59	53	49	50	54
Average Crown Length (ft)	37.1	44.2	43.5	42.2	41.7	40.1
Dead Trees per Acre	5	5	10	25	5	0
Dead Basal Area (sq.ft/a)	1.0	2.1	4.4	37.2	0.8	0.0
Dead Total Volume (cu.ft/a)	21	61	113	1407	16	0
Topkill Volume (cu.ft/a)	0.2	0.0	0.0	0.0	0.0	0.4
6 Years After Treatment (1991)						
Live Trees per Acre	105	135	95	65	120	140
Live Basal Area (sq.ft/a)	129.7	159.0	144.4	104.9	171.6	176.2
Crown Competition Factor	96	122	107	76	125	129
Relative Density Index	33.4	41.5	35.3	25.3	42.6	45.2
Mean Diameter (in)	15.0	14.7	16.7	17.2	16.2	15.2
Dead Trees per Acre	15	5	10	25	5	0
Dead Basal Area (sq.ft/a)	17.7	2.1	4.4	37.2	0.8	0.0
12 Years After Treatment (1997)						
Live Trees per Acre	105	135	85	60	110	135
Live Basal Area (sq.ft/a)	147.1	181.6	161.0	115.6	185.2	193.7
Live Total Projected Volume (cu.ft/a)	5988	6979	7026	5103	8079	7582
Crown Competition Factor	108	137	116	81	132	140
Relative Density Index	36.7	45.8	37.3	26.7	44.2	48.1
Site Height (ft)	97.9	99.6	104.8	99.4	102.3	93.8
Mean Diameter (in)	16.0	15.7	18.6	18.8	17.6	16.2
Average Projected Height Growth (ft)	10.1	10.1	11.4	15.9	13.9	11.1
Average Crown Ratio (%)	47	54	56	49	47	50
Average Crown Length (ft)	42.0	45.8	59.8	46.6	45.2	46.9
Dead Trees per Acre	15	5	20	30	15	5
Dead Basal Area (sq.ft/a)	17.7	2.1	7.0	42.1	9.3	10.1
Dead Total Volume (cu.ft/a)	757	61	174	1544	299	425
Topkill Volume (cu.ft/a)	0.3	0.0	0.0	0.0	0.0	0.6

Installation 295 PARKERS FLAT
Region: Northeast Oregon Ownership: Boise Cascade
Legal Description: T2N R39E Section 34 Meridian: Willamette

	Plot Number					
	1	2	3	4	5	6
Treatment	None	400#N	200#N	400#N	200#N	None
Mensurational Characteristics:						
At Time of Treatment (1985)	Stand Total Age = 32					
Live Trees per Acre	260	250	280	220	220	240
Live Basal Area (sq.ft/a)	103.7	108.5	118.1	127.5	138.5	124.6
Live Total Volume (cu.ft/a)	1824	1959	2081	2475	2861	2370
Crown Competition Factor	91	95	103	108	117	106
Relative Density Index	35.5	36.3	39.8	39.7	42.3	39.9
Site Height (ft)	47.9	48.1	52.8	50.5	54.5	49.1
Mean Diameter (in)	8.6	8.9	8.8	10.3	10.7	9.8
Average Crown Ratio (%)	61	59	56	57	59	62
Average Crown Length (ft)	25.1	26.1	22.3	26.0	29.1	27.2
Species Composition (% of BA)						
Ponderosa Pine	100.0	100.0	100.0	100.0	100.0	100.0
2 Years After Treatment (1987)						
Live Trees per Acre	260	250	280	220	220	240
Live Basal Area (sq.ft/a)	113.2	120.9	130.9	138.1	147.6	134.0
Live Total Volume (cu.ft/a)	2115	2302	2440	2837	3211	2686
Crown Competition Factor	99	105	112	116	124	113
Relative Density Index	37.9	39.4	43.0	42.2	44.3	42.1
Site Height (ft)	50.7	50.3	55.2	52.9	56.6	51.4
Mean Diameter (in)	8.9	9.4	9.3	10.7	11.1	10.1
Average Height Growth (ft)	2.5	2.3	2.1	2.3	2.5	2.3
Dead Trees per Acre	0	0	0	0	0	0
Dead Basal Area (sq.ft/a)	0.0	0.0	0.0	0.0	0.0	0.0
Dead Total Volume (cu.ft/a)	0	0	0	0	0	0
Topkill Volume (cu.ft/a)	0.0	0.0	0.0	0.0	0.0	0.0
4 Years After Treatment (1989)						
Live Trees per Acre	260	250	280	220	220	240
Live Basal Area (sq.ft/a)	121.8	131.9	143.7	147.7	156.1	142.2
Live Total Volume (cu.ft/a)	2396	2642	2819	3184	3549	3003
Crown Competition Factor	106	114	123	123	130	119
Relative Density Index	40.0	42.1	46.1	44.3	46.2	44.0
Site Height (ft)	52.7	52.5	57.7	55.1	59.0	53.6
Mean Diameter (in)	9.3	9.8	9.7	11.1	11.4	10.4
Average Height Growth (ft)	4.6	4.6	4.1	4.3	4.6	4.5
Average Crown Ratio (%)	58	56	54	56	57	59
Average Crown Length (ft)	26.6	27.3	23.9	27.9	30.8	28.5
Dead Trees per Acre	0	0	0	0	0	0
Dead Basal Area (sq.ft/a)	0.0	0.0	0.0	0.0	0.0	0.0
Dead Total Volume (cu.ft/a)	0	0	0	0	0	0
Topkill Volume (cu.ft/a)	0.0	0.0	0.4	0.0	0.0	0.0
6 Years After Treatment (1991)						
Live Trees per Acre	260	250	280	220	220	240
Live Basal Area (sq.ft/a)	129.6	140.5	154.7	155.7	163.3	149.9
Crown Competition Factor	111	121	131	128	135	125
Relative Density Index	41.9	44.1	48.8	46.1	47.8	45.8
Mean Diameter (in)	9.6	10.2	10.1	11.4	11.7	10.7
Dead Trees per Acre	0	0	0	0	0	0
Dead Basal Area (sq.ft/a)	0.0	0.0	0.0	0.0	0.0	0.0
12 Years After Treatment (1997)						
Live Trees per Acre	260	40	260	170	220	240
Live Basal Area (sq.ft/a)	156.2	33.2	183.6	136.0	188.4	176.3
Live Total Projected Volume (cu.ft/a)	3684	792	4235	3396	4995	4436
Crown Competition Factor	131	27	150	109	152	143
Relative Density Index	48.2	9.4	54.4	39.1	53.2	51.7
Site Height (ft)	61.1	56.1	66.3	60.8	67.9	61.1
Mean Diameter (in)	10.5	12.3	11.4	12.1	12.5	11.6
Average Projected Height Growth (ft)	12.1	11.1	10.0	11.3	12.3	12.1
Average Crown Ratio (%)	48	49	40	46	46	45
Average Crown Length (ft)	25.2	25.4	19.3	25.3	27.3	24.7
Dead Trees per Acre	0	210	20	50	0	0
Dead Basal Area (sq.ft/a)	0.0	113.7	3.1	38.1	0.0	0.0
Dead Total Volume (cu.ft/a)	0	2270	41	828	0	0
Topkill Volume (cu.ft/a)	0.0	0.0	0.4	0.0	0.0	0.0

Installation 296 MOSES CREEK
Region: Central Washington
Legal Description: T21N R14E Section 24

Ownership: Forest Service
Meridian: Willamette

	Plot Number					
	1	2	3	4	5	6
Treatment	400#N	None	200#N	None	400#N	200#N
Mensurational Characteristics:						
At Time of Treatment (1985)	Stand Total Age = 37					
Live Trees per Acre	150	170	150	200	160	190
Live Basal Area (sq.ft/a)	82.5	78.3	93.5	88.8	106.4	106.2
Live Total Volume (cu.ft/a)	1397	1304	1566	1481	2103	1837
Crown Competition Factor	70	67	81	78	88	91
Relative Density Index	26.0	25.8	29.9	29.6	32.0	33.4
Site Height (ft)	46.1	46.1	45.6	46.4	51.0	46.8
Mean Diameter (in)	10.0	9.2	9.8	9.0	11.0	10.1
Average Crown Ratio (%)	64	64	63	60	60	63
Average Crown Length (ft)	25.1	24.9	25.2	23.1	27.2	25.9
Species Composition (% of BA)						
Ponderosa Pine	100.0	100.0	100.0	100.0	100.0	100.0
2 Years After Treatment (1987)						
Live Trees per Acre	150	170	180	200	160	190
Live Basal Area (sq.ft/a)	96.4	89.9	107.5	99.6	120.3	120.3
Live Total Volume (cu.ft/a)	1772	1647	1972	1825	2600	2248
Crown Competition Factor	80	76	91	87	98	102
Relative Density Index	29.3	28.6	33.2	32.2	35.1	36.7
Site Height (ft)	49.0	50.2	49.3	50.6	55.2	49.6
Mean Diameter (in)	10.9	9.8	10.5	9.6	11.7	10.8
Average Height Growth (ft)	3.1	3.6	3.5	3.7	3.7	3.2
Dead Trees per Acre	0	0	0	0	0	0
Dead Basal Area (sq.ft/a)	0.0	0.0	0.0	0.0	0.0	0.0
Dead Total Volume (cu.ft/a)	0	0	0	0	0	0
Topkill Volume (cu.ft/a)	0.0	0.0	0.0	0.0	0.0	0.0
4 Years After Treatment (1989)						
Live Trees per Acre	150	170	180	200	160	190
Live Basal Area (sq.ft/a)	111.6	100.8	121.3	110.2	134.9	134.8
Live Total Volume (cu.ft/a)	2217	2015	2421	2202	3172	2732
Crown Competition Factor	91	85	102	94	108	113
Relative Density Index	32.6	31.2	36.4	34.7	38.3	39.9
Site Height (ft)	52.0	54.4	52.9	54.6	59.8	52.8
Mean Diameter (in)	11.7	10.4	11.1	10.0	12.4	11.4
Average Height Growth (ft)	6.4	7.2	6.9	7.1	7.3	6.7
Average Crown Ratio (%)	62	59	57	54	55	63
Average Crown Length (ft)	28.5	27.4	26.7	24.6	28.9	30.2
Dead Trees per Acre	0	0	0	0	0	0
Dead Basal Area (sq.ft/a)	0.0	0.0	0.0	0.0	0.0	0.0
Dead Total Volume (cu.ft/a)	0	0	0	0	0	0
Topkill Volume (cu.ft/a)	0.0	0.0	0.0	0.0	0.0	0.0
6 Years After Treatment (1991)						
Live Trees per Acre	150	170	180	200	160	190
Live Basal Area (sq.ft/a)	123.8	111.9	133.1	120.4	147.9	149.3
Crown Competition Factor	100	93	109	101	117	122
Relative Density Index	35.3	33.8	39.0	37.1	41.0	43.1
Mean Diameter (in)	12.3	11.0	11.6	10.5	13.0	12.0
Dead Trees per Acre	0	0	0	0	0	0
Dead Basal Area (sq.ft/a)	0.0	0.0	0.0	0.0	0.0	0.0
12 Years After Treatment (1997)						
Live Trees per Acre	150	170	180	170	160	190
Live Basal Area (sq.ft/a)	156.1	142.3	162.5	141.2	178.6	182.9
Live Total Projected Volume (cu.ft/a)	3762	3642	3988	3699	5121	4586
Crown Competition Factor	120	114	129	113	136	144
Relative Density Index	42.0	40.4	45.3	40.2	47.2	50.2
Site Height (ft)	60.1	67.8	64.1	68.0	71.8	61.5
Mean Diameter (in)	13.8	12.4	12.9	12.3	14.3	13.3
Average Projected Height Growth (ft)	14.3	18.2	15.1	18.2	17.0	16.5
Average Crown Ratio (%)	46	49	44	35	42	51
Average Crown Length (ft)	26.6	25.7	24.8	20.2	27.4	27.3
Dead Trees per Acre	0	0	0	30	0	0
Dead Basal Area (sq.ft/a)	0.0	0.0	0.0	6.0	0.0	0.0
Dead Total Volume (cu.ft/a)	0	0	0	85	0	0
Topkill Volume (cu.ft/a)	0.0	0.0	0.0	0.0	0.0	0.0

Installation 297 UPPER MUD CREEK
Region: Central Washington Ownership: Forest Service
Legal Description: T27N R20E Section 25 Meridian: Willamette

	Plot Number					
	1	2	3	4	5	6
Treatment	None	400#N	200#N	200#N	None	400#N
Mensurational Characteristics:						
At Time of Treatment (1985)	Stand Total Age = 73					
Live Trees per Acre	140	120	140	170	170	190
Live Basal Area (sq.ft/a)	70.6	66.0	61.9	62.6	76.9	80.0
Live Total Volume (cu.ft/a)	1360	1302	1080	983	1483	1410
Crown Competition Factor	61	57	54	55	67	70
Relative Density Index	22.8	20.8	20.6	21.8	25.5	27.0
Site Height (ft)	52.2	51.9	47.3	40.7	51.0	48.0
Mean Diameter (in)	9.6	10.0	9.0	8.2	9.1	8.8
Average Crown Ratio (%)	64	58	64	62	64	64
Average Crown Length (ft)	29.2	27.8	26.8	23.1	29.4	27.5
Species Composition (% of BA)						
Ponderosa Pine	100.0	100.0	100.0	100.0	100.0	100.0
2 Years After Treatment (1987)						
Live Trees per Acre	140	110	140	170	170	190
Live Basal Area (sq.ft/a)	75.8	65.4	67.0	68.4	83.4	87.8
Live Total Volume (cu.ft/a)	1546	1307	1233	1135	1687	1620
Crown Competition Factor	65	56	58	59	72	77
Relative Density Index	24.0	20.2	21.9	23.3	27.1	28.9
Site Height (ft)	54.9	52.5	49.7	42.9	53.5	50.0
Mean Diameter (in)	10.0	10.4	9.4	8.6	9.5	9.2
Average Height Growth (ft)	2.6	0.5	2.4	2.3	2.2	2.0
Dead Trees per Acre	0	10	0	0	0	0
Dead Basal Area (sq.ft/a)	0.0	4.7	0.0	0.0	0.0	0.0
Dead Total Volume (cu.ft/a)	0	92	0	0	0	0
Topkill Volume (cu.ft/a)	0.0	0.0	0.0	0.0	0.0	0.0
4 Years After Treatment (1989)						
Live Trees per Acre	140	30	140	170	170	190
Live Basal Area (sq.ft/a)	80.8	17.2	70.4	72.4	88.7	93.4
Live Total Volume (cu.ft/a)	1701	358	1337	1243	1857	1778
Crown Competition Factor	69	15	61	63	76	81
Relative Density Index	25.2	5.4	22.7	24.4	28.4	30.3
Site Height (ft)	56.3	49.9	51.3	44.5	55.1	49.3
Mean Diameter (in)	10.3	10.3	9.6	8.8	9.8	9.5
Average Height Growth (ft)	4.0	3.5	3.9	3.6	3.8	3.4
Average Crown Ratio (%)	62	58	65	63	62	62
Average Crown Length (ft)	30.7	28.5	29.8	25.8	30.7	28.6
Dead Trees per Acre	0	90	0	0	0	0
Dead Basal Area (sq.ft/a)	0.0	53.8	0.0	0.0	0.0	0.0
Dead Total Volume (cu.ft/a)	0	1071	0	0	0	0
Topkill Volume (cu.ft/a)	0.0	0.0	0.0	0.0	0.0	0.0
6 Years After Treatment (1991)						
Live Trees per Acre	140	30	140	170	170	190
Live Basal Area (sq.ft/a)	87.1	18.7	75.1	78.1	95.3	100.9
Crown Competition Factor	73	16	65	68	81	87
Relative Density Index	26.6	5.7	23.9	25.8	29.9	32.1
Mean Diameter (in)	10.7	10.7	9.9	9.2	10.1	9.9
Dead Trees per Acre	0	90	0	0	0	0
Dead Basal Area (sq.ft/a)	0.0	53.8	0.0	0.0	0.0	0.0
12 Years After Treatment (1997)						
Live Trees per Acre	.	.	.	.	.	.
Live Basal Area (sq.ft/a)	.	.	.	.	.	.
Live Total Projected Volume (cu.ft/a)	.	.	.	.	.	.
Crown Competition Factor	.	.	.	.	.	.
Relative Density Index	.	.	.	.	.	.
Site Height (ft)	.	.	.	.	.	.
Mean Diameter (in)	.	.	.	.	.	.
Average Projected Height Growth (ft)	.	.	.	.	.	.
Average Crown Ratio (%)	.	.	.	.	.	.
Average Crown Length (ft)	.	.	.	.	.	.
Dead Trees per Acre	.	.	.	.	.	.
Dead Basal Area (sq.ft/a)	.	.	.	.	.	.
Dead Total Volume (cu.ft/a)	.	.	.	.	.	.
Topkill Volume (cu.ft/a)	.	.	.	.	.	.

Installation 298 LILLY LAKE
Region: Central Washington
Legal Description: T21N R20E Section 22

Ownership: Washington DNR
Meridian: Willamette

	Plot Number					
	1	2	3	4	5	6
Treatment	200#N	None	400#N	200#N	None	400#N
Mensurational Characteristics:						
At Time of Treatment (1985)	Stand Total Age = 79					
Live Trees per Acre	190	190	180	150	200	150
Live Basal Area (sq.ft/a)	101.6	94.3	104.9	71.8	82.7	84.6
Live Total Volume (cu.ft/a)	2461	2051	2351	1507	1684	1966
Crown Competition Factor	86	81	90	62	72	71
Relative Density Index	32.3	30.5	32.6	23.4	28.0	26.5
Site Height (ft)	62.0	55.5	55.0	58.2	53.8	61.2
Mean Diameter (in)	9.9	9.5	10.3	9.4	8.7	10.2
Average Crown Ratio (%)	47	51	54	56	52	60
Average Crown Length (ft)	25.9	26.3	29.3	27.7	25.5	30.6
Species Composition (% of BA)						
Ponderosa Pine	100.0	100.0	100.0	100.0	100.0	100.0
2 Years After Treatment (1987)						
Live Trees per Acre	190	190	180	150	200	150
Live Basal Area (sq.ft/a)	110.2	101.9	113.2	77.6	89.2	90.7
Live Total Volume (cu.ft/a)	2790	2332	2643	1705	1885	2184
Crown Competition Factor	93	87	96	66	78	76
Relative Density Index	34.3	32.4	34.5	24.9	29.7	28.0
Site Height (ft)	64.4	58.3	56.7	60.4	55.9	62.9
Mean Diameter (in)	10.3	9.9	10.7	9.7	9.0	10.5
Average Height Growth (ft)	2.1	2.4	1.9	2.2	1.8	1.7
Dead Trees per Acre	0	0	0	0	0	0
Dead Basal Area (sq.ft/a)	0.0	0.0	0.0	0.0	0.0	0.0
Dead Total Volume (cu.ft/a)	0	0	0	0	0	0
Topkill Volume (cu.ft/a)	0.0	0.0	0.0	0.0	0.0	0.0
4 Years After Treatment (1989)						
Live Trees per Acre	190	190	160	150	200	150
Live Basal Area (sq.ft/a)	115.9	106.4	105.1	81.4	92.7	94.2
Live Total Volume (cu.ft/a)	3050	2518	2535	1839	2018	2340
Crown Competition Factor	97	90	88	69	80	78
Relative Density Index	35.6	33.4	31.7	25.8	30.5	28.8
Site Height (ft)	67.1	59.8	59.5	61.7	57.4	65.0
Mean Diameter (in)	10.6	10.1	11.0	10.0	9.2	10.7
Average Height Growth (ft)	4.0	4.0	3.8	3.7	3.3	3.5
Average Crown Ratio (%)	52	53	57	60	57	58
Average Crown Length (ft)	31.0	29.4	32.8	32.0	29.9	31.3
Dead Trees per Acre	0	0	20	0	0	0
Dead Basal Area (sq.ft/a)	0.0	0.0	13.1	0.0	0.0	0.0
Dead Total Volume (cu.ft/a)	0	0	310	0	0	0
Topkill Volume (cu.ft/a)	0.0	0.0	0.0	0.0	0.0	0.0
6 Years After Treatment (1991)						
Live Trees per Acre	190	190	150	150	200	140
Live Basal Area (sq.ft/a)	123.4	113.3	106.5	86.9	98.0	96.2
Crown Competition Factor	102	96	89	73	85	79
Relative Density Index	37.4	35.0	31.5	27.1	31.8	28.7
Mean Diameter (in)	10.9	10.5	11.4	10.3	9.5	11.2
Dead Trees per Acre	0	0	30	0	0	10
Dead Basal Area (sq.ft/a)	0.0	0.0	18.7	0.0	0.0	3.6
12 Years After Treatment (1997)						
Live Trees per Acre	190	190	150	150	200	140
Live Basal Area (sq.ft/a)	137.0	130.7	121.8	96.6	110.5	106.6
Live Total Projected Volume (cu.ft/a)	4012	3571	3358	2421	2678	2953
Crown Competition Factor	111	108	99	81	95	87
Relative Density Index	40.4	39.0	34.9	29.3	34.8	31.0
Site Height (ft)	74.8	67.8	66.5	67.1	63.1	71.2
Mean Diameter (in)	11.5	11.2	12.2	10.9	10.1	11.8
Average Projected Height Growth (ft)	9.5	11.6	10.1	9.0	8.8	9.3
Average Crown Ratio (%)	47	52	52	44	47	51
Average Crown Length (ft)	29.2	33.5	33.9	26.7	28.9	30.8
Dead Trees per Acre	0	0	30	0	0	10
Dead Basal Area (sq.ft/a)	0.0	0.0	18.7	0.0	0.0	3.6
Dead Total Volume (cu.ft/a)	0	0	427	0	0	65
Topkill Volume (cu.ft/a)	0.0	0.0	0.0	0.0	0.0	0.0

Installation 299 LICK CREEK
Region: Central Washington
Legal Description: T21N R16E Section 30

Ownership: Boise Cascade
Meridian: Willamette

	Plot Number					
	1	2	3	4	5	6
Treatment	400#N	200#N	None	None	200#N	400#N
Mensurational Characteristics:						
At Time of Treatment (1985)	Stand Total Age = 69					
Live Trees per Acre	280	210	230	220	240	240
Live Basal Area (sq.ft/a)	162.7	156.8	164.3	159.9	165.8	194.5
Live Total Volume (cu.ft/a)	4324	4214	4825	4653	5034	5872
Crown Competition Factor	139	129	136	131	138	155
Relative Density Index	50.7	45.8	48.6	47.1	49.4	55.7
Site Height (ft)	72.3	70.7	80.0	75.6	76.5	79.2
Mean Diameter (in)	10.3	11.7	11.4	11.5	11.3	12.2
Average Crown Ratio (%)	46	47	41	41	41	43
Average Crown Length (ft)	27.3	29.1	26.7	27.0	29.1	29.4
Species Composition (% of BA)						
Douglas-fir	5.1	0.0	5.9	0.0	0.0	0.0
Ponderosa Pine	94.9	100.0	94.1	100.0	100.0	100.0
2 Years After Treatment (1987)						
Live Trees per Acre	280	210	230	220	240	240
Live Basal Area (sq.ft/a)	174.8	167.1	172.5	167.8	176.5	205.3
Live Total Volume (cu.ft/a)	4803	4669	5231	5054	5576	6450
Crown Competition Factor	148	136	142	136	145	164
Relative Density Index	53.4	48.1	50.4	48.8	51.8	58.0
Site Height (ft)	74.8	72.9	82.3	77.9	79.2	82.3
Mean Diameter (in)	10.7	12.1	11.7	11.8	11.6	12.5
Average Height Growth (ft)	2.0	2.3	2.0	2.1	2.4	2.5
Dead Trees per Acre	0	0	0	0	0	0
Dead Basal Area (sq.ft/a)	0.0	0.0	0.0	0.0	0.0	0.0
Dead Total Volume (cu.ft/a)	0	0	0	0	0	0
Topkill Volume (cu.ft/a)	0.0	0.0	0.0	0.0	0.0	0.0
4 Years After Treatment (1989)						
Live Trees per Acre	280	210	230	220	230	240
Live Basal Area (sq.ft/a)	186.2	177.5	180.1	174.6	181.1	216.1
Live Total Volume (cu.ft/a)	5301	5168	5628	5445	5970	7029
Crown Competition Factor	156	143	147	141	148	171
Relative Density Index	56.0	50.3	52.0	50.3	52.2	60.3
Site Height (ft)	77.0	75.3	84.4	80.3	81.8	84.6
Mean Diameter (in)	11.0	12.4	12.0	12.1	12.0	12.8
Average Height Growth (ft)	4.2	4.7	3.9	4.3	5.0	4.7
Average Crown Ratio (%)	49	49	44	45	45	48
Average Crown Length (ft)	31.4	32.6	30.6	32.2	34.1	35.1
Dead Trees per Acre	0	0	0	0	10	0
Dead Basal Area (sq.ft/a)	0.0	0.0	0.0	0.0	5.2	0.0
Dead Total Volume (cu.ft/a)	0	0	0	0	144	0
Topkill Volume (cu.ft/a)	0.0	0.0	0.0	0.0	0.0	0.0
6 Years After Treatment (1991)						
Live Trees per Acre	280	210	230	220	230	240
Live Basal Area (sq.ft/a)	201.0	189.5	187.4	181.3	193.1	229.9
Crown Competition Factor	167	151	151	145	155	180
Relative Density Index	59.3	52.8	53.6	51.7	54.8	63.2
Mean Diameter (in)	11.5	12.9	12.2	12.3	12.4	13.3
Dead Trees per Acre	0	0	0	0	10	0
Dead Basal Area (sq.ft/a)	0.0	0.0	0.0	0.0	5.2	0.0
12 Years After Treatment (1997)						
Live Trees per Acre	280	180	230	210	210	240
Live Basal Area (sq.ft/a)	230.6	186.4	209.3	196.5	208.1	260.4
Live Total Projected Volume (cu.ft/a)	7356	6133	7227	6880	7794	9646
Crown Competition Factor	190	145	167	155	163	200
Relative Density Index	65.8	50.2	58.2	54.3	56.7	69.3
Site Height (ft)	84.5	84.4	91.3	88.5	91.2	93.6
Mean Diameter (in)	12.3	13.8	12.9	13.1	13.5	14.1
Average Projected Height Growth (ft)	11.7	12.6	11.0	11.8	13.8	14.5
Average Crown Ratio (%)	37	46	38	38	39	37
Average Crown Length (ft)	26.8	33.6	28.9	26.7	32.6	28.5
Dead Trees per Acre	0	30	0	10	30	0
Dead Basal Area (sq.ft/a)	0.0	26.3	0.0	4.5	14.0	0.0
Dead Total Volume (cu.ft/a)	0	806	0	122	403	0
Topkill Volume (cu.ft/a)	0.0	0.0	0.0	0.0	0.0	0.0

Installation 300 SAGE FLAT
Region: Central Washington
Legal Description: T6N R12E Section 17

Ownership: Washington DNR
Meridian: Willamette

	Plot Number					
	1	2	3	4	5	6
Treatment	None	200#N	400#N	400#N	200#N	None
Mensurational Characteristics:						
At Time of Treatment (1985)	Stand Total Age = 95					
Live Trees per Acre	210	260	200	250	220	240
Live Basal Area (sq.ft/a)	220.0	219.2	189.2	239.0	206.4	210.7
Live Total Volume (cu.ft/a)	7532	7952	6639	8161	7448	6967
Crown Competition Factor	169	175	147	187	161	167
Relative Density Index	59.1	62.2	52.1	65.7	57.0	59.2
Site Height (ft)	83.9	98.6	88.0	89.1	98.1	87.2
Mean Diameter (in)	13.9	12.4	13.2	13.2	13.1	12.7
Average Crown Ratio (%)	45	30	36	39	38	40
Average Crown Length (ft)	33.6	24.6	28.1	29.7	29.0	29.5
Species Composition (% of BA)						
Ponderosa Pine	100.0	100.0	100.0	100.0	100.0	100.0
2 Years After Treatment (1987)						
Live Trees per Acre	210	260	200	250	220	240
Live Basal Area (sq.ft/a)	230.6	230.1	200.5	253.6	218.1	221.6
Live Total Volume (cu.ft/a)	8154	8646	7284	8958	8112	7561
Crown Competition Factor	176	182	154	196	168	175
Relative Density Index	61.2	64.5	54.5	68.7	59.4	61.4
Site Height (ft)	86.4	101.5	90.9	91.7	100.5	89.3
Mean Diameter (in)	14.2	12.7	13.6	13.6	13.5	13.0
Average Height Growth (ft)	2.4	2.4	2.4	2.3	2.2	2.[illegible]
Dead Trees per Acre	0	0	0	0	0	0
Dead Basal Area (sq.ft/a)	0.0	0.0	0.0	0.0	0.0	0.0
Dead Total Volume (cu.ft/a)	0	0	0	0	0	0
Topkill Volume (cu.ft/a)	0.0	0.0	0.0	0.0	0.0	0.0
4 Years After Treatment (1989)						
Live Trees per Acre	210	260	200	250	220	240
Live Basal Area (sq.ft/a)	242.0	243.1	214.0	271.3	231.4	232.6
Live Total Volume (cu.ft/a)	8509	9429	8016	9888	8865	8164
Crown Competition Factor	184	191	163	208	177	182
Relative Density Index	63.5	67.2	57.2	72.2	62.1	63.7
Site Height (ft)	88.7	104.3	93.7	94.0	103.1	91.4
Mean Diameter (in)	14.5	13.1	14.0	14.1	13.9	13.3
Average Height Growth (ft)	4.5	4.7	4.7	4.4	4.4	4.1
Average Crown Ratio (%)	50	41	45	43	43	45
Average Crown Length (ft)	39.8	35.0	36.6	34.2	35.4	35.0
Dead Trees per Acre	0	0	0	0	0	0
Dead Basal Area (sq.ft/a)	0.0	0.0	0.0	0.0	0.0	0.0
Dead Total Volume (cu.ft/a)	0	0	0	0	0	0
Topkill Volume (cu.ft/a)	0.0	0.0	0.0	0.0	0.0	0.0
6 Years After Treatment (1991)						
Live Trees per Acre	210	250	200	240	220	240
Live Basal Area (sq.ft/a)	251.0	247.6	222.6	282.5	240.1	241.0
Crown Competition Factor	190	193	169	214	182	188
Relative Density Index	65.2	67.5	58.9	73.7	63.8	65.4
Mean Diameter (in)	14.8	13.5	14.3	14.7	14.1	13.6
Dead Trees per Acre	0	10	0	10	0	0
Dead Basal Area (sq.ft/a)	0.0	3.4	0.0	0.6	0.0	0.0
12 Years After Treatment (1997)						
Live Trees per Acre	210	250	200	240	200	230
Live Basal Area (sq.ft/a)	277.6	273.6	250.5	316.0	257.1	264.7
Live Total Projected Volume (cu.ft/a)	11018	11575	10199	12467	10825	10187
Crown Competition Factor	206	209	187	236	190	201
Relative Density Index	70.3	72.7	64.3	80.2	65.6	69.4
Site Height (ft)	96.0	112.8	101.0	100.4	109.9	98.1
Mean Diameter (in)	15.6	14.2	15.2	15.5	15.4	14.5
Average Projected Height Growth (ft)	11.5	10.3	11.0	10.1	10.9	10.3
Average Crown Ratio (%)	39	39	36	43	37	36
Average Crown Length (ft)	31.5	33.0	29.4	36.0	31.7	27.8
Dead Trees per Acre	0	10	0	10	20	10
Dead Basal Area (sq.ft/a)	0.0	3.4	0.0	0.6	12.3	4.3
Dead Total Volume (cu.ft/a)	0	106	0	6	327	104
Topkill Volume (cu.ft/a)	0.0	0.0	0.0	0.0	0.0	0.0

Installation 301 Lubrecht Exp. Forest
Region: Montana Ownership: UofM--Lubrecht
Legal Description: T13N R15W Section 16 Meridian: Principal

	Plot Number					
	1	2	3	4	5	6
Treatment	200#N	None	N+K	N+K	200#N	None
Mensurational Characteristics:						
At Time of Treatment (1987)	Stand Total Age = 89					
Live Trees per Acre	270	260	230	250	180	200
Live Basal Area (sq.ft/a)	90.2	83.2	67.5	95.7	73.4	80.6
Live Total Volume (cu.ft/a)	1767	1625	1249	1957	1573	1533
Crown Competition Factor	80	74	64	97	63	72
Relative Density Index	32.3	30.0	24.9	33.1	25.0	27.5
Site Height (ft)	54.4	55.3	50.4	58.4	61.3	52.5
Mean Diameter (in)	7.8	7.7	7.3	8.4	8.6	8.6
Average Crown Ratio (%)	45	44	44	46	49	51
Average Crown Length (ft)	20.8	19.6	19.0	22.5	23.6	23.2
Species Composition (% of BA)						
Douglas-fir	0.0	0.0	8.7	40.8	0.0	4.6
Ponderosa Pine	100.0	100.0	91.3	59.2	100.0	95.4
2 Years After Treatment (1989)						
Live Trees per Acre	270	260	230	250	180	200
Live Basal Area (sq.ft/a)	98.7	90.2	74.9	102.6	80.7	86.9
Live Total Volume (cu.ft/a)	2018	1840	1449	2173	1799	1719
Crown Competition Factor	87	79	70	103	70	77
Relative Density Index	34.5	31.9	26.9	34.8	26.8	29.1
Site Height (ft)	56.4	57.6	52.5	60.5	63.5	54.8
Mean Diameter (in)	8.2	8.0	7.7	8.7	9.1	8.9
Average Height Growth (ft)	2.0	1.8	1.8	1.9	2.0	1.8
AVERAGE CROWN RATIO (%)	48	46	48	49	51	54
AVERAGE CROWN LENGTH (FT)	23.1	21.1	21.5	25.0	25.3	25.3
Dead Trees per Acre	0	0	0	0	0	0
Dead Basal Area (sq.ft/a)	0.0	0.0	0.0	0.0	0.0	0.0
Dead Total Volume (cu.ft/a)	0	0	0	0	0	0
Topkill Volume (cu.ft/a)	0.0	0.0	0.0	0.0	0.0	0.0
4 Years After Treatment (1991)						
Live Trees per Acre	270	260	230	250	180	200
Live Basal Area (sq.ft/a)	107.3	96.5	83.5	109.5	87.8	92.0
Live Total Volume (cu.ft/a)	2336	2086	1727	2448	2068	1926
Crown Competition Factor	94	84	77	109	75	81
Relative Density Index	36.7	33.6	29.2	36.6	28.5	30.4
Site Height (ft)	59.7	60.8	56.2	63.7	67.0	57.9
Mean Diameter (in)	8.5	8.2	8.2	9.0	9.5	9.2
Average Height Growth (ft)	5.1	4.3	4.8	4.7	5.1	4.4
Average Crown Ratio (%)	44	40	43	44	44	47
Average Crown Length (ft)	22.6	19.7	20.5	23.7	22.6	23.1
Dead Trees per Acre	0	0	0	0	0	0
Dead Basal Area (sq.ft/a)	0.0	0.0	0.0	0.0	0.0	0.0
Dead Total Volume (cu.ft/a)	0	0	0	0	0	0
Topkill Volume (cu.ft/a)	0.0	0.0	0.0	0.0	0.0	0.0
10 Years After Treatment (1997)						
Live Trees per Acre	250	260	220	250	180	200
Live Basal Area (sq.ft/a)	124.3	116.7	100.7	127.3	105.9	108.7
Live Total Projected Volume (cu.ft/a)	3086	2872	2366	3142	2783	2595
Crown Competition Factor	107	100	91	125	89	94
Relative Density Index	40.2	38.7	33.3	41.0	32.9	34.4
Site Height (ft)	66.6	68.2	63.3	69.9	74.1	66.9
Mean Diameter (in)	9.5	9.1	9.2	9.7	10.4	10.0
Average Projected Height Growth (ft)	11.5	10.3	10.7	10.8	11.0	10.5
Average Crown Ratio (%)	44	37	42	38	46	43
Average Crown Length (ft)	26.3	18.4	21.7	23.3	25.2	23.1
Dead Trees per Acre	20	0	10	0	0	0
Dead Basal Area (sq.ft/a)	5.0	0.0	3.3	0.0	0.0	0.0
Dead Total Volume (cu.ft/a)	93	0	61	0	0	0
Topkill Volume (cu.ft/a)	0.0	0.0	0.0	0.0	0.0	0.0

Installation 302 Blue Mountain
Region: Montana Ownership: Forest Service
Legal Description: T13N R20W Section 34 Meridian: Principal

	Plot Number					
	1	2	3	4	5	6
Treatment	200#N	None	N+K	N+K	None	200#N
Mensurational Characteristics:						
At Time of Treatment (1987)	Stand Total Age = 100					
Live Trees per Acre	190	240	280	350	330	350
Live Basal Area (sq.ft/a)	157.9	158.3	126.7	129.2	115.3	122.0
Live Total Volume (cu.ft/a)	4844	4450	3028	2743	2318	2508
Crown Competition Factor	129	135	117	124	106	127
Relative Density Index	44.9	47.7	42.0	45.0	40.8	43.2
Site Height (ft)	78.0	74.2	65.8	60.1	55.5	58.1
Mean Diameter (in)	12.3	11.0	9.1	8.2	8.0	8.0
Average Crown Ratio (%)	47	41	38	35	40	45
Average Crown Length (ft)	31.9	26.7	21.2	17.9	18.7	21.3
Species Composition (% of BA)						
Douglas-fir	9.1	13.3	17.6	28.4	10.8	43.0
Ponderosa Pine	90.9	86.7	82.4	71.6	89.2	57.0
2 Years After Treatment (1989)						
Live Trees per Acre	190	230	280	340	330	350
Live Basal Area (sq.ft/a)	162.4	161.1	131.8	133.2	119.8	127.4
Live Total Volume (cu.ft/a)	5131	4661	3241	2899	2473	2682
Crown Competition Factor	132	137	121	127	110	132
Relative Density Index	45.9	47.8	43.2	45.8	41.9	44.6
Site Height (ft)	80.0	75.7	67.7	61.4	56.5	59.6
Mean Diameter (in)	12.5	11.3	9.3	8.5	8.2	8.2
Average Height Growth (ft)	2.0	1.6	1.7	1.3	1.3	1.3
AVERAGE CROWN RATIO (%)	53	44	44	38	43	46
AVERAGE CROWN LENGTH (FT)	37.5	29.3	25.0	19.6	20.8	22.5
Dead Trees per Acre	0	10	0	10	0	0
Dead Basal Area (sq.ft/a)	0.0	1.6	0.0	1.2	0.0	0.0
Dead Total Volume (cu.ft/a)	0	31	0	19	0	0
Topkill Volume (cu.ft/a)	0.0	0.0	1.4	2.4	0.0	1.2
4 Years After Treatment (1991)						
Live Trees per Acre	190	230	280	340	330	320
Live Basal Area (sq.ft/a)	165.2	162.7	134.2	135.7	122.2	119.9
Live Total Volume (cu.ft/a)	5414	4959	3435	3053	2616	2629
Crown Competition Factor	133	138	123	129	112	126
Relative Density Index	46.5	49.2	43.8	46.4	42.6	41.7
Site Height (ft)	82.6	78.2	70.4	63.4	58.7	61.8
Mean Diameter (in)	12.6	11.4	9.4	8.6	8.2	8.3
Average Height Growth (ft)	4.5	3.6	4.0	3.1	3.2	3.0
Average Crown Ratio (%)	47	38	38	33	39	39
Average Crown Length (ft)	34.3	26.2	22.4	18.1	19.4	19.7
Dead Trees per Acre	0	10	0	10	0	30
Dead Basal Area (sq.ft/a)	0.0	1.6	0.0	1.2	0.0	11.0
Dead Total Volume (cu.ft/a)	0	31	0	19	0	216
Topkill Volume (cu.ft/a)	0.0	0.0	1.5	2.4	0.0	0.0
10 Years After Treatment (1997)						
Live Trees per Acre	190	220	280	330	320	320
Live Basal Area (sq.ft/a)	179.2	173.3	147.5	148.2	132.5	136.7
Live Total Projected Volume (cu.ft/a)	6622	5769	4229	3693	3162	3337
Crown Competition Factor	142	145	134	140	122	140
Relative Density Index	49.4	50.0	47.0	49.2	44.9	45.9
Site Height (ft)	90.9	85.8	77.8	71.8	64.4	68.7
Mean Diameter (in)	13.1	12.0	9.8	9.1	8.7	8.8
Average Projected Height Growth (ft)	13.7	11.0	10.4	8.7	8.9	8.7
Average Crown Ratio (%)	32	40	33	33	36	36
Average Crown Length (ft)	14.9	30.9	20.6	19.9	19.9	22.8
Dead Trees per Acre	0	20	0	20	10	30
Dead Basal Area (sq.ft/a)	0.0	2.9	0.0	2.3	2.4	11.0
Dead Total Volume (cu.ft/a)	0	55	0	37	47	218
Topkill Volume (cu.ft/a)	0.0	0.0	1.5	2.4	0.0	0.0

Installation 303 Four Mile Creek
Region: Montana Ownership: Forest Service
Legal Description: T18N R27W Section 12 Meridian: Principal

	Plot Number					
	1	2	3	4	5	6
Treatment	200#N	None	N+K	N+K	None	200#N
Mensurational Characteristics:						
At Time of Treatment (1987)	Stand Total Age = 81					
Live Trees per Acre	170	170	200	140	170	170
Live Basal Area (sq.ft/a)	138.2	124.9	145.3	138.0	127.4	112.9
Live Total Volume (cu.ft/a)	4546	3770	4374	4756	3857	3447
Crown Competition Factor	109	102	123	108	105	101
Relative Density Index	39.6	36.7	42.8	37.6	37.2	34.0
Site Height (ft)	84.8	74.4	76.3	84.4	77.0	77.0
Mean Diameter (in)	12.2	11.6	11.5	13.4	11.7	11.0
Average Crown Ratio (%)	52	51	47	57	56	45
Average Crown Length (ft)	36.0	34.3	33.5	43.4	37.5	32.6
Species Composition (% of BA)						
Douglas-fir	0.0	0.0	5.7	0.0	4.1	16.9
Ponderosa Pine	100.0	100.0	94.3	100.0	95.9	83.1
2 Years After Treatment (1989)						
Live Trees per Acre	-170	170	200	140	170	170
Live Basal Area (sq.ft/a)	142.1	130.8	152.2	145.1	132.6	118.6
Live Total Volume (cu.ft/a)	4788	4070	4732	5150	4128	3748
Crown Competition Factor	112	106	128	112	109	106
Relative Density Index	40.4	37.9	44.3	39.1	38.3	35.3
Site Height (ft)	86.6	76.4	78.5	86.6	78.8	79.2
Mean Diameter (in)	12.4	11.9	11.8	13.8	12.0	11.3
Average Height Growth (ft)	1.6	1.8	1.9	2.2	1.8	2.2
AVERAGE CROWN RATIO (%)	50	49	48	54	56	43
AVERAGE CROWN LENGTH (FT)	35.1	34.2	34.7	42.8	38.4	32.4
Dead Trees per Acre	0	0	0	0	0	0
Dead Basal Area (sq.ft/a)	0.0	0.0	0.0	0.0	0.0	0.0
Dead Total Volume (cu.ft/a)	0	0	0	0	0	0
Topkill Volume (cu.ft/a)	0.0	0.0	0.0	0.0	0.0	0.0
4 Years After Treatment (1991)						
Live Trees per Acre	170	170	200	140	170	170
Live Basal Area (sq.ft/a)	147.2	136.9	160.7	154.4	138.1	126.0
Live Total Volume (cu.ft/a)	5145	4436	5227	5716	4469	4192
Crown Competition Factor	116	110	134	118	113	111
Relative Density Index	41.5	39.3	46.1	40.9	39.5	36.9
Site Height (ft)	89.5	79.2	81.8	90.1	81.4	82.7
Mean Diameter (in)	12.6	12.2	12.1	14.2	12.2	11.7
Average Height Growth (ft)	4.0	4.4	4.8	5.8	4.4	5.7
Average Crown Ratio (%)	43	45	44	49	47	41
Average Crown Length (ft)	31.9	32.5	33.4	40.6	34.1	31.8
Dead Trees per Acre	0	0	0	0	0	0
Dead Basal Area (sq.ft/a)	0.0	0.0	0.0	0.0	0.0	0.0
Dead Total Volume (cu.ft/a)	0	0	0	0	0	0
Topkill Volume (cu.ft/a)	0.0	0.0	0.0	5.7	0.0	0.0
10 Years After Treatment (1997)						
Live Trees per Acre	170	170	160	140	170	140
Live Basal Area (sq.ft/a)	159.9	153.0	142.2	176.7	152.4	122.2
Live Total Projected Volume (cu.ft/a)	6051	5389	4962	7139	5340	4487
Crown Competition Factor	124	121	116	132	123	106
Relative Density Index	44.1	42.7	39.8	45.3	42.6	34.4
Site Height (ft)	96.4	85.6	85.3	97.7	87.0	90.8
Mean Diameter (in)	13.1	12.8	12.8	15.2	12.8	12.7
Average Projected Height Growth (ft)	9.7	9.9	10.3	13.2	10.0	13.1
Average Crown Ratio (%)	45	46	45	48	51	41
Average Crown Length (ft)	38.9	35.5	36.9	44.3	40.7	36.7
Dead Trees per Acre	0	0	40	0	0	30
Dead Basal Area (sq.ft/a)	0.0	0.0	33.8	0.0	0.0	18.9
Dead Total Volume (cu.ft/a)	0	0	1156	0	0	629
Topkill Volume (cu.ft/a)	0.0	0.0	0.0	6.5	0.0	0.0

Installation 304 Hinchwood Creek
Region: Montana Ownership: Champion
Legal Description: T21N R25W Section 19 Meridian: Principal

	Plot Number					
	1	2	3	4	5	6
Treatment	None	N+K	200#N	N+K	None	200#N
Mensurational Characteristics:						
At Time of Treatment (1987)	Stand Total Age = 60					
Live Trees per Acre	250	370	220	300	280	280
Live Basal Area (sq.ft/a)	125.1	147.5	136.3	104.6	102.8	122.1
Live Total Volume (cu.ft/a)	3200	3601	3723	2372	2269	2882
Crown Competition Factor	107	128	117	92	91	106
Relative Density Index	40.4	50.5	41.7	37.0	35.9	40.8
Site Height (ft)	70.5	66.4	72.8	64.2	63.0	63.4
Mean Diameter (in)	9.6	8.6	10.7	8.0	8.2	8.9
Average Crown Ratio (%)	54	46	50	49	46	50
Average Crown Length (ft)	31.1	25.7	32.3	25.7	23.8	26.7
Species Composition (% of BA)						
Douglas-fir	0.4	0.0	9.8	0.0	0.0	4.3
Ponderosa Pine	99.6	100.0	90.2	100.0	100.0	95.7
2 Years After Treatment (1989)						
Live Trees per Acre	250	370	220	300	270	280
Live Basal Area (sq.ft/a)	131.9	154.3	143.2	112.2	105.7	130.5
Live Total Volume (cu.ft/a)	3494	3920	4078	2638	2424	3207
Crown Competition Factor	113	134	122	98	93	114
Relative Density Index	42.1	52.2	43.3	39.0	36.3	42.9
Site Height (ft)	72.8	68.7	73.7	66.1	65.0	63.7
Mean Diameter (in)	9.8	8.7	10.9	8.3	8.5	9.2
Average Height Growth (ft)	2.0	2.0	2.3	1.8	1.8	2.2
AVERAGE CROWN RATIO (%)	55	46	50	49	45	46
AVERAGE CROWN LENGTH (FT)	32.8	26.9	33.5	26.5	24.2	26.0
Dead Trees per Acre	0	0	0	0	10	0
Dead Basal Area (sq.ft/a)	0.0	0.0	0.0	0.0	2.4	0.0
Dead Total Volume (cu.ft/a)	0	0	0	0	45	0
Topkill Volume (cu.ft/a)	0.0	0.0	0.0	0.0	0.0	0.0
4 Years After Treatment (1991)						
Live Trees per Acre	250	370	220	300	270	280
Live Basal Area (sq.ft/a)	138.7	162.4	151.7	121.4	111.0	140.1
Live Total Volume (cu.ft/a)	3871	4379	4603	3054	2702	3674
Crown Competition Factor	119	140	128	105	97	121
Relative Density Index	43.7	54.2	45.2	41.4	37.7	45.3
Site Height (ft)	76.0	72.1	77.9	70.1	68.5	67.3
Mean Diameter (in)	10.1	9.0	11.2	8.6	8.7	9.6
Average Height Growth (ft)	5.0	5.3	6.3	5.5	5.0	5.9
Average Crown Ratio (%)	47	42	44	46	40	43
Average Crown Length (ft)	30.0	25.9	30.9	26.7	22.8	26.0
Dead Trees per Acre	0	0	0	0	10	0
Dead Basal Area (sq.ft/a)	0.0	0.0	0.0	0.0	2.4	0.0
Dead Total Volume (cu.ft/a)	0	0	0	0	45	0
Topkill Volume (cu.ft/a)	0.0	0.0	0.0	0.0	0.0	0.0
10 Years After Treatment (1997)						
Live Trees per Acre	250	370	210	300	270	280
Live Basal Area (sq.ft/a)	156.8	183.5	166.5	140.6	124.5	161.5
Live Total Projected Volume (cu.ft/a)	4860	5584	5637	3939	3365	4717
Crown Competition Factor	133	155	137	121	107	138
Relative Density Index	47.9	59.4	47.9	46.2	41.1	50.4
Site Height (ft)	82.7	78.0	83.6	76.3	74.7	73.7
Mean Diameter (in)	10.7	9.5	12.1	9.3	9.2	10.3
Average Projected Height Growth (ft)	11.5	12.9	13.5	11.2	11.1	12.4
Average Crown Ratio (%)	49	38	43	45	42	48
Average Crown Length (ft)	35.4	25.7	32.0	29.3	28.0	31.1
Dead Trees per Acre	0	0	10	0	10	0
Dead Basal Area (sq.ft/a)	0.0	0.0	2.8	0.0	2.4	0.0
Dead Total Volume (cu.ft/a)	0	0	55	0	45	0
Topkill Volume (cu.ft/a)	0.0	0.0	0.0	0.0	0.0	0.0

Installation 305 Libby Plantation
Region: Montana Ownership: Champion
Legal Description: T29N R31W Section 12 Meridian: Principal

	Plot Number					
	1	2	3	4	5	6
Treatment	None	N+K	200#N	200#N	N+K	None
Mensurational Characteristics:						
At Time of Treatment (1987)	Stand Total Age = 42					
Live Trees per Acre	230	210	230	240	200	230
Live Basal Area (sq.ft/a)	111.9	102.1	84.5	96.0	101.3	110.8
Live Total Volume (cu.ft/a)	2557	2371	1654	2061	2249	2566
Crown Competition Factor	97	89	74	84	87	96
Relative Density Index	36.4	33.2	29.5	32.8	32.6	36.1
Site Height (ft)	59.4	62.5	52.9	54.8	57.4	60.9
Mean Diameter (in)	9.4	9.4	8.2	8.6	9.6	9.4
Average Crown Ratio (%)	55	54	57	53	57	56
Average Crown Length (ft)	30.1	29.9	26.9	27.6	30.9	31.2
Species Composition (% of BA)						
Ponderosa Pine	100.0	100.0	100.0	100.0	100.0	100.0
2 Years After Treatment (1989)						
Live Trees per Acre	230	210	220	230	200	230
Live Basal Area (sq.ft/a)	120.4	109.7	89.1	99.7	109.4	119.0
Live Total Volume (cu.ft/a)	2864	2676	1848	2250	2568	2901
Crown Competition Factor	103	95	78	86	95	103
Relative Density Index	38.5	35.1	30.4	33.4	34.6	38.1
Site Height (ft)	61.9	64.9	55.6	57.6	60.2	63.7
Mean Diameter (in)	9.8	9.8	8.6	8.9	10.0	9.7
Average Height Growth (ft)	2.4	2.4	2.5	2.6	2.7	2.7
AVERAGE CROWN RATIO (%)	48	47	48	46	50	47
AVERAGE CROWN LENGTH (FT)	27.8	27.3	23.9	25.1	28.3	27.7
Dead Trees per Acre	0	0	10	10	0	0
Dead Basal Area (sq.ft/a)	0.0	0.0	2.2	3.3	0.0	0.0
Dead Total Volume (cu.ft/a)	0	0	34	69	0	0
Topkill Volume (cu.ft/a)	0.0	0.0	0.0	0.0	0.0	0.0
4 Years After Treatment (1991)						
Live Trees per Acre	230	210	210	210	200	230
Live Basal Area (sq.ft/a)	129.6	119.5	93.5	97.1	118.6	126.1
Live Total Volume (cu.ft/a)	3314	3147	2097	2325	3009	3301
Crown Competition Factor	111	102	81	84	101	108
Relative Density Index	40.7	37.4	31.1	32.0	36.7	39.8
Site Height (ft)	65.4	69.3	59.6	61.1	64.4	67.6
Mean Diameter (in)	10.2	10.2	9.0	9.2	10.4	10.0
Average Height Growth (ft)	6.0	6.3	6.3	6.5	6.7	6.6
Average Crown Ratio (%)	47	48	41	39	46	44
Average Crown Length (ft)	28.5	29.2	21.8	22.9	27.5	27.2
Dead Trees per Acre	0	0	20	30	0	0
Dead Basal Area (sq.ft/a)	0.0	0.0	5.4	13.3	0.0	0.0
Dead Total Volume (cu.ft/a)	0	0	95	306	0	0
Topkill Volume (cu.ft/a)	0.0	0.0	0.0	0.0	0.0	0.0
10 Years After Treatment (1997)						
Live Trees per Acre	230	200	200	200	200	230
Live Basal Area (sq.ft/a)	153.8	137.1	106.1	104.7	138.6	144.6
Live Total Projected Volume (cu.ft/a)	4488	4103	2721	2810	3998	4305
Crown Competition Factor	128	113	91	91	116	123
Relative Density Index	46.2	40.9	33.8	33.4	41.3	44.1
Site Height (ft)	73.5	78.4	67.2	67.0	71.7	75.3
Mean Diameter (in)	11.1	11.2	9.9	9.8	11.3	10.7
Average Projected Height Growth (ft)	13.7	13.0	13.2	13.2	13.8	13.9
Average Crown Ratio (%)	89	89	89	89	48	49
Average Crown Length (ft)	59.3	58.1	56.1	56.5	31.7	32.7
Dead Trees per Acre	0	10	30	40	0	0
Dead Basal Area (sq.ft/a)	0.0	2.0	9.1	20.1	0.0	0.0
Dead Total Volume (cu.ft/a)	0	30	179	487	0	0
Topkill Volume (cu.ft/a)	0.0	0.0	0.0	0.0	0.0	0.0

Installation 306 Sedlak Creek
Region: Montana
Legal Description: T26N R29W Section 9

Ownership: Champion
Meridian: Principal

	Plot Number 1	2	3	4	5	6
Treatment	200#N	None	N+K	200#N	N+K	None
Mensurational Characteristics:						
At Time of Treatment (1987)	Stand Total Age = 5					
Live Trees per Acre	240	210	170	220	230	230
Live Basal Area (sq.ft/a)	199.4	128.5	108.0	166.4	132.0	125.4
Live Total Volume (cu.ft/a)	6218	3161	2922	5183	3826	3284
Crown Competition Factor	162	113	91	136	112	110
Relative Density Index	56.8	39.5	32.9	48.5	41.2	39.7
Site Height (ft)	82.4	64.5	72.6	78.5	75.2	68.4
Mean Diameter (in)	12.3	10.6	10.8	11.8	10.3	10.0
Average Crown Ratio (%)	49	56	61	53	46	50
Average Crown Length (ft)	33.0	31.8	38.6	39.1	31.4	32.5
Species Composition (% of BA)						
Douglas-fir	3.7	6.3	0.0	0.0	0.0	4.0
Western Larch	13.1	27.8	13.0	12.8	12.5	35.8
Ponderosa Pine	83.2	65.4	87.0	87.2	87.5	60.1
Engelmann Spruce	0.0	0.5	0.0	0.0	0.0	0.0
2 Years After Treatment (1989)						
Live Trees per Acre	240	210	170	180	230	230
Live Basal Area (sq.ft/a)	208.6	138.0	116.9	148.5	140.4	132.2
Live Total Volume (cu.ft/a)	6718	3526	3301	4770	4222	3582
Crown Competition Factor	168	120	98	120	118	116
Relative Density Index	58.7	41.6	34.9	42.3	43.2	41.3
Site Height (ft)	84.6	66.5	75.4	81.1	77.9	70.3
Mean Diameter (in)	12.6	11.0	11.2	12.3	10.6	10.3
Average Height Growth (ft)	2.2	2.1	2.4	2.3	2.0	2.1
AVERAGE CROWN RATIO (%)	48	54	54	39	44	46
AVERAGE CROWN LENGTH (FT)	32.8	32.1	36.2	29.8	30.9	31.3
Dead Trees per Acre	0	0	0	40	0	0
Dead Basal Area (sq.ft/a)	0.0	0.0	0.0	26.2	0.0	0.0
Dead Total Volume (cu.ft/a)	0	0	0	837	0	0
Topkill Volume (cu.ft/a)	0.0	0.0	0.0	0.0	0.0	0.0
4 Years After Treatment (1991)						
Live Trees per Acre	240	210	170	180	230	230
Live Basal Area (sq.ft/a)	219.6	148.6	127.5	158.5	149.7	139.0
Live Total Volume (cu.ft/a)	7419	4013	3837	5366	4741	3958
Crown Competition Factor	176	127	105	127	124	120
Relative Density Index	61.0	44.0	37.2	44.5	45.3	42.8
Site Height (ft)	87.9	69.7	79.5	85.0	81.5	73.9
Mean Diameter (in)	13.0	11.4	11.7	12.7	10.9	10.5
Average Height Growth (ft)	5.4	5.5	6.2	6.0	5.2	5.1
Average Crown Ratio (%)	45	52	53	37	41	42
Average Crown Length (ft)	32.5	32.2	36.7	29.7	29.6	29.5
Dead Trees per Acre	0	0	0	40	0	0
Dead Basal Area (sq.ft/a)	0.0	0.0	0.0	26.2	0.0	0.0
Dead Total Volume (cu.ft/a)	0	0	0	837	0	0
Topkill Volume (cu.ft/a)	0.0	0.0	0.0	0.0	0.0	0.0
10 Years After Treatment (1997)						
Live Trees per Acre	240	210	170	180	230	230
Live Basal Area (sq.ft/a)	246.2	182.9	153.6	183.7	175.8	161.2
Live Total Projected Volume (cu.ft/a)	9110	5650	5181	6903	6176	5164
Crown Competition Factor	193	151	122	143	143	137
Relative Density Index	66.5	51.5	42.8	49.7	51.1	47.9
Site Height (ft)	94.7	76.5	87.3	93.0	89.0	82.0
Mean Diameter (in)	13.7	12.6	12.9	13.7	11.8	11.3
Average Projected Height Growth (ft)	12.6	14.8	13.8	14.1	14.5	13.4
Average Crown Ratio (%)	46	40	46	39	47	42
Average Crown Length (ft)	39.3	27.7	35.1	32.8	37.4	30.0
Dead Trees per Acre	0	0	0	40	0	0
Dead Basal Area (sq.ft/a)	0.0	0.0	0.0	26.2	0.0	0.0
Dead Total Volume (cu.ft/a)	0	0	0	837	0	0
Topkill Volume (cu.ft/a)	0.0	0.0	0.0	0.0	0.0	0.0

Section III

GROWTH RESPONSE SUMMARIES FOR ALL OF THE PONDEROSA PINE INSTALLATIONS

INSTALLATION 291 SARDINE SPRINGS
Region: N.E. Oregon Ownership: USFS Meridian: Willamette
Legal Description: T7S R42E Section 4 Veg. Series: DF Parent Material: Basalt

INITIAL CHARATERISTICS:

Age (years)	89	CCF	58.8
Trees per Acre	70.8	Relative Density Index	20.4
Basal Area (sq. ft/a)	76.8	Average Crown Length (ft.)	35.6
Total Volume (cu. ft./a)	2478	Average Crown Ratio (%)	49.8
Species Composition (% of total BA)		Mean Diameter (in.)	14.1
Ponderosa Pine	100	Site Height	76.1

Note: all increments have been adjusted to a common initial basal area of 76.8 sq. ft/a.

12 YEAR VOLUME GROWTH:

			RESPONSE	
	Treatment	Increment	Difference	% of Control
12-year Net Volume (cu. ft/acre)	Control	1436		
	200#N	1396	-40	-2.8
	400#N	1469	33	2.3
12-year Gross Volume (cu. ft/acre)	Control	1459		
	200#N	1384	-75	-5.1
	400#N	1458	-1	0.1

12 YEAR BASAL AREA GROWTH:

			RESPONSE	
	Treatment	Increment	Difference	% of Control
12-year Net Basal Area (sq. ft/acre)	Control	31.0		
	200#N	31.0	0	0
	400#N	30.2	-0.8	-2.6
12-year Gross Basal Area (sq. ft/acre)	Control	31.7		
	200#N	30.7	-1.0	- 3.2
	400#N	29.9	-1.8	-5.7

PERIODIC ANNUAL INCREMENT (PAI) — BASAL AREA GROWTH:

	RESPONSE (YEARS 1-2)				RESPONSE (YEARS 3-4)		
	Treatment	Increment	Difference	%	Increment	Difference	%
Net Basal Area PAI (sq. ft/a)	Control	3.7			2.6		
	200#N	3.7	0	0	2.4	-0.2	-7.7
	400#N	4.1	0.4	10.8	2.5	-0.1	-3.8
Gross Basal Area PAI (sq. ft/a)	Control	3.8			2.7		
	200#N	3.6	-0.2	-5.3	2.4	-0.3	-11.1
	400#N	4.1	0.3	7.9	2.4	-0.3	-11.1

	RESPONSE (YEARS 5-6)				RESPONSE (YEARS 7-12)		
	Treatment	Increment	Difference	%	Increment	Difference	%
Net Basal Area PAI (sq. ft/a)	Control	2.3			2.3		
	200#N	2.2	-0.1	-4.3	2.4	0.1	4.3
	400#N	2.1	-0.2	-8.7	2.1	-0.2	-8.7
Gross Basal Area PAI (sq. ft/a)	Control	2.3			2.4		
	200#N	2.1	-0.2	-8.7	2.4	0	0
	400#N	2.1	-0.2	-8.7	2.1	-0.3	-12.5

INSTALLATION 292 SPARTA BUTTE
Region: N.E. Oregon Ownership: USFS Meridian: Willamette
Legal Description: T8S R44E Section 4 Veg. Series: DF Parent Material: Basalt

INITIAL CHARATERISTICS:

Age (years)	99	CCF	90.5
Trees per Acre	90.8	Relative Density Index	30.2
Basal Area (sq. ft/a)	119.5	Average Crown Length (ft.)	41.2
Total Volume (cu. ft./a)	4588	Average Crown Ratio (%)	49.0
Species Composition (% of total BA)		Mean Diameter (in.)	15.7
Douglas-fir	5.9	Site Height	90.8
Ponderosa Pine	94.1		

Note: all increments have been adjusted to a common initial basal area of 119.5 sq. ft/a.

12 YEAR VOLUME GROWTH:

			RESPONSE	
	Treatment	Increment	Difference	% of Control
12-year Net Volume (cu. ft/acre)	Control	1328		
	200#N	749	-579	-43.6
	400#N	2044	716	53.9
12-year Gross Volume (cu. ft/acre)	Control	1764		
	200#N	1535	-229	-12.9
	400#N	1986	222	12.6

12 YEAR BASAL AREA GROWTH:

			RESPONSE	
	Treatment	Increment	Difference	% of Control
12-year Net Basal Area (sq. ft/acre)	Control	18.6		
	200#N	9.7	-8.9	-47.8
	400#N	38.8	20.2	108.6
12-year Gross Basal Area (sq. ft/acre)	Control	29.7		
	200#N	27.6	-2.1	-7.1
	400#N	37.0	7.3	24.6

PERIODIC ANNUAL INCREMENT (PAI) — BASAL AREA GROWTH:

		RESPONSE (YEARS 1-2)			RESPONSE (YEARS 3-4)		
	Treatment	Increment	Difference	%	Increment	Difference	%
Net Basal Area PAI (sq. ft/a)	Control	2.2			1.3		
	200#N	45.4	43.2	1963.6	-109.1	-110.4	-8492
	400#N	3.9	1.7	77.3	2.6	1.3	100.0
Gross Basal Area PAI (sq. ft/a)	Control	3.1			2.0		
	200#N	3.1	0	0	1.9	-0.1	-5.0
	400#N	3.8	0.7	22.6	2.4	0.4	20.0

		RESPONSE (YEARS 5-6)			RESPONSE (YEARS 7-12)		
	Treatment	Increment	Difference	%	Increment	Difference	%
Net Basal Area PAI (sq. ft/a)	Control	1.6			1.4		
	200#N	32.6	31	1938	12.0	10.6	757.1
	400#N	3.3	1.7	106.3	3.2	1.8	128.6
Gross Basal Area PAI (sq. ft/a)	Control	2.2			2.5		
	200#N	2.2	0	0	2.2	-0.3	-12.0
	400#N	3.1	0.9	40.9	3.1	0.6	24.0

INSTALLATION 293 SUMMIT SALVAGE
Region: N.E. Oregon Ownership: USFS Meridian: Willamette
Legal Description: T5S R41E Section 27 Veg. Series: GF Parent Material: Basalt

INITIAL CHARATERISTICS:

Age (years)	46	CCF	75.6
Trees per Acre	176.7	Relative Density Index	28.5
Basal Area (sq. ft/a)	88.5	Average Crown Length (ft.)	25.4
Total Volume (cu. ft./a)	1688	Average Crown Ratio (%)	59.9
Species Composition (% of total BA)		Mean Diameter (in.)	9.6
Douglas-fir	3.9	Site Height	51.5
Ponderosa Pine	96.1		

Note: all increments have been adjusted to a common initial basal area of 88.5 sq. ft/a.

12 YEAR VOLUME GROWTH:

			RESPONSE	
	Treatment	Increment	Difference	% of Control
12-year Net Volume (cu. ft/acre)	Control	1253		
	200#N	1135	-118	-9.4
	400#N	1354	101	8.1
12-year Gross Volume (cu. ft/acre)	Control	1377		
	200#N	1392	15	1.1
	400#N	1467	90	6.5

12 YEAR BASAL AREA GROWTH:

			RESPONSE	
	Treatment	Increment	Difference	% of Control
12-year Net Basal Area (sq. ft/acre)	Control	27.8		
	200#N	29.7	1.9	6.8
	400#N	41.2	13.4	48.2
12-year Gross Basal Area (sq. ft/acre)	Control	34.8		
	200#N	42.6	7.8	22.4
	400#N	49.9	15.1	43.4

PERIODIC ANNUAL INCREMENT (PAI) — BASAL AREA GROWTH:

		RESPONSE (YEARS 1-2)			RESPONSE (YEARS 3-4)		
	Treatment	Increment	Difference	%	Increment	Difference	%
Net Basal Area PAI (sq. ft/a)	Control	3.2			1.6		
	200#N	4.5	1.3	40.6	3.7	2.1	131.3
	400#N	5.7	2.5	78.1	3.9	2.3	143.8
Gross Basal Area PAI (sq. ft/a)	Control	3.3			2.8		
	200#N	4.7	1.4	42.4	3.9	1.1	39.3
	400#N	5.4	2.1	63.6	4.7	1.9	67.9

		RESPONSE (YEARS 5-6)			RESPONSE (YEARS 7-12)		
	Treatment	Increment	Difference	%	Increment	Difference	%
Net Basal Area PAI (sq. ft/a)	Control	1.7			2.5		
	200#N	2.5	0.8	47.1	1.4	-1.1	-44.0
	400#N	5.1	3.4	200.0	2.0	-0.5	-20.0
Gross Basal Area PAI (sq. ft/a)	Control	2.8			2.8		
	200#N	3.8	1.0	35.7	3.0	0.2	7.1
	400#N	4.8	2.0	71.4	3.4	0.6	21.4

INSTALLATION 294 MOSES CREEK
Region: N.E. Oregon Ownership: Boise Cascade Meridian: Willamette
Legal Description: T3N R40E Section 30 Veg. Series: DF Parent Material: Basalt

INITIAL CHARATERISTICS:

Age (years)	80	CCF	103.0
Trees per Acre	120.0	Relative Density Index	35.9
Basal Area (sq. ft/a)	136.6	Average Crown Length (ft.)	37.0
Total Volume (cu. ft./a)	4921	Average Crown Ratio (%)	50.2
Species Composition (% of total BA)		Mean Diameter (in.)	14.5
Douglas-fir 2.8 W. Larch 3.0		Site Height	88.8
Ponderosa Pine 94.2			

Note: all increments have been adjusted to a common initial basal area of 136.6 sq. ft/a.

12 YEAR VOLUME GROWTH:

			RESPONSE	
	Treatment	Increment	Difference	% of Control
12-year Net Volume (cu. ft/acre)	Control	1805		
	200#N	2348	543	30.1
	400#N	1463	-342	-18.9
12-year Gross Volume (cu. ft/acre)	Control	2366		
	200#N	2639	273	11.5
	400#N	2242	-124	-5.2

12 YEAR BASAL AREA GROWTH:

			RESPONSE	
	Treatment	Increment	Difference	% of Control
12-year Net Basal Area (sq. ft/acre)	Control	24.0		
	200#N	43.0	19.0	79.2
	400#N	15.2	-8.8	-36.7
12-year Gross Basal Area (sq. ft/acre)	Control	38.5		
	200#N	50.5	12.0	31.2
	400#N	36.9	-1.6	-4.2

PERIODIC ANNUAL INCREMENT (PAI) — BASAL AREA GROWTH:

		RESPONSE (YEARS 1-2)			RESPONSE (YEARS 3-4)		
	Treatment	Increment	Difference	%	Increment	Difference	%
Net Basal Area PAI (sq. ft/a)	Control	3.1			2.6		
	200#N	4.9	1.8	58.1	3.3	0.7	26.9
	400#N	5.0	1.9	61.3	-11.9	-14.5	-557.7
Gross Basal Area PAI (sq. ft/a)	Control	3.5			3.0		
	200#N	5.1	1.6	45.7	3.9	0.9	30.0
	400#N	3.5	0	0	2.8	-0.2	-6.7

		RESPONSE (YEARS 5-6)			RESPONSE (YEARS 7-12)		
	Treatment	Increment	Difference	%	Increment	Difference	%
Net Basal Area PAI (sq. ft/a)	Control	-0.8			2.4		
	200#N	4.0	4.8	600.0	3.1	0.7	29.2
	400#N	4.2	5.0	625.0	3.4	1.0	41.7
Gross Basal Area PAI (sq. ft/a)	Control	3.2			3.2		
	200#N	4.1	0.9	28.1	4.0	0.8	25.0
	400#N	3.0	-0.2	-6.3	3.1	-0.1	-3.1

INSTALLATION 295 PARKER'S FLAT
Region: N.E. Oregon Ownership: Boise Cascade Meridian: Willamette
Legal Description: T2N R39E Section 34 Veg. Series: DF Parent Material: Basalt

INITIAL CHARATERISTICS:

Age (years)	33	CCF	103.4
Trees per Acre	245.0	Relative Density Index	38.9
Basal Area (sq. ft/a)	120.1	Average Crown Length (ft.)	26.0
Total Volume (cu. ft./a)	2261	Average Crown Ratio (%)	59.2
Species Composition (% of total BA)		Mean Diameter (in.)	9.5
Ponderosa Pine 100		Site Height	50.5

Note: all increments have been adjusted to a common initial basal area of 120.1 sq. ft/a.

12 YEAR VOLUME GROWTH:

			RESPONSE	
	Treatment	Increment	Difference	% of Control
12-year Net Volume (cu. ft/acre)	Control	2141		
	200#N	1903	-238	-11.1
	400#N	-59	-2200	-102.8
12-year Gross Volume (cu. ft/acre)	Control	2083		
	200#N	2002	-81	-3.9
	400#N	1470	-613	-29.4

12 YEAR BASAL AREA GROWTH:

			RESPONSE	
	Treatment	Increment	Difference	% of Control
12-year Net Basal Area (sq. ft/acre)	Control	55.8		
	200#N	52.6	-3.2	-5.7
	400#N	-32.0	-87.8	-157.3
12-year Gross Basal Area (sq. ft/acre)	Control	54.1		
	200#N	56.4	2.3	4.3
	400#N	43.3	-10.8	-20.0

PERIODIC ANNUAL INCREMENT (PAI) — BASAL AREA GROWTH:

		RESPONSE (YEARS 1-2)			RESPONSE (YEARS 3-4)		
	Treatment	Increment	Difference	%	Increment	Difference	%
Net Basal Area PAI (sq. ft/a)	Control	5.1			4.5		
	200#N	5.0	-0.1	-20.0	4.9	0.4	8.9
	400#N	5.5	0.4	7.8	4.9	0.4	8.9
Gross Basal Area PAI (sq. ft/a)	Control	4.9			4.4		
	200#N	5.2	0.3	6.1	5.1	0.7	15.9
	400#N	5.9	1.0	20.4	5.2	0.8	18.2

		RESPONSE (YEARS 5-6)			RESPONSE (YEARS 7-12)		
	Treatment	Increment	Difference	%	Increment	Difference	%
Net Basal Area PAI (sq. ft/a)	Control	4.1			4.7		
	200#N	4.1	0	0	4.1	-0.6	-12.8
	400#N	4.0	-0.1	-2.4	-10.1	14.8	-314.9
Gross Basal Area PAI (sq. ft/a)	Control	4.0			4.6		
	200#N	4.3	0.3	7.5	4.5	-0.1	-2.2
	400#N	4.2	0.2	5.0	2.1	-2.5	-54.3

INSTALLATION 296 CORRAL CREEK
Region: C. Washington Ownership: USFS Meridian: Willamette
Legal Description: T21N R14E Section 24 Veg. Series: GF Parent Material: Sandstone

INITIAL CHARATERISTICS:

Age (years)	37	CCF	79.2
Trees per Acre	175.0	Relative Density Index	29.5
Basal Area (sq. ft/a)	92.6	Average Crown Length (ft.)	25.2
Total Volume (cu. ft./a)	1615	Average Crown Ratio (%)	62.2
Species Composition (% of total BA)		Mean Diameter (in.)	9.9
Ponderosa Pine	100	Site Height	47.0

Note: all increments have been adjusted to a common initial basal area of 92.6 sq. ft/a.

12 YEAR VOLUME GROWTH:

			RESPONSE	
	Treatment	Increment	Difference	% of Control
12-year Net Volume (cu. ft/acre)	Control	2547		
	200#N	2372	-175	-6.9
	400#N	2636	89	3.5
12-year Gross Volume (cu. ft/acre)	Control	2502		
	200#N	2441	-61	-2.4
	400#N	2654	152	6.1

12 YEAR BASAL AREA GROWTH:

			RESPONSE	
	Treatment	Increment	Difference	% of Control
12-year Net Basal Area (sq. ft/acre)	Control	63.8		
	200#N	68.4	4.6	7.2
	400#N	71.7	7.9	12.4
12-year Gross Basal Area (sq. ft/acre)	Control	64.3		
	200#N	70.4	6.1	9.5
	400#N	72.2	7.9	12.3

PERIODIC ANNUAL INCREMENT (PAI) — BASAL AREA GROWTH:

		RESPONSE (YEARS 1-2)			RESPONSE (YEARS 3-4)		
	Treatment	Increment	Difference	%	Increment	Difference	%
Net Basal Area PAI (sq. ft/a)	Control	6.1			5.9		
	200#N	6.6	0.5	8.2	6.6	0.7	11.9
	400#N	6.8	0.7	11.5	7.3	1.4	23.7
Gross Basal Area PAI (sq. ft/a)	Control	5.9			5.6		
	200#N	6.8	0.9	15.3	6.8	1.2	21.4
	400#N	6.9	1.0	16.9	7.4	1.8	32.1

		RESPONSE (YEARS 5-6)			RESPONSE (YEARS 7-12)		
	Treatment	Increment	Difference	%	Increment	Difference	%
Net Basal Area PAI (sq. ft/a)	Control	5.8			4.7		
	200#N	6.2	0.4	6.9	4.9	0.2	4.3
	400#N	6.2	0.4	6.9	5.2	0.5	10.6
Gross Basal Area PAI (sq. ft/a)	Control	5.6			5.0		
	200#N	6.3	0.7	12.5	5.1	0.1	2.0
	400#N	6.3	0.7	12.5	5.2	0.2	4.0

INSTALLATION 297 UPPER MUD CREED
Region: C. Washington Ownership: USFS Meridian: Willamette
Legal Description: T27N R20E Section 25 Veg. Series: DF Parent Material: Granite

INITIAL CHARATERISTICS:

Age (years)	74	CCF	60.6
Trees per Acre	155.0	Relative Density Index	23.1
Basal Area (sq. ft/a)	69.7	Average Crown Length (ft.)	27.3
Total Volume (cu. ft./a)	1270	Average Crown Ratio (%)	62.7
Species Composition (% of total BA)		Mean Diameter (in.)	9.1
Ponderosa Pine 100		Site Height	48.5

Note: all increments have been adjusted to a common initial basal area of 69.7 sq. ft/a.

4 YEAR VOLUME GROWTH:

			RESPONSE	
	Treatment	Increment	Difference	% of Control
4-year Net Volume (cu. ft/acre)	Control	302		
	200#N	367	65	21.5
	400#N	-340	-642	-212.6
4-year Gross Volume (cu. ft/acre)	Control	334		
	200#N	312	-22	-6.6
	400#N	224	-110	-32.9

6 YEAR BASAL AREA GROWTH:

			RESPONSE	
	Treatment	Increment	Difference	% of Control
6-year Net Basal Area (sq. ft/acre)	Control	16.1		
	200#N	16.8	0.7	4.3
	400#N	-14.4	-30.5	-189.4
6-year Gross Basal Area (sq. ft/acre)	Control	16.6		
	200#N	15.8	-0.8	-4.8
	400#N	13.0	-3.6	-21.7

PERIODIC ANNUAL INCREMENT (PAI) — BASAL AREA GROWTH:

	RESPONSE (YEARS 1-2)				RESPONSE (YEARS 3-4)		
	Treatment	Increment	Difference	%	Increment	Difference	%
Net Basal Area PAI (sq. ft/a)	Control	2.8			2.1		
	200#N	2.9	0.1	3.6	2.7	0.6	28.6
	400#N	1.7	-1.1	-39.3	-11.0	-13.1	-623.8
Gross Basal Area PAI (sq. ft/a)	Control	2.8			2.4		
	200#N	2.9	0.1	3.6	2.1	-0.3	-12.5
	400#N	2.9	0.1	3.6	1.5	-0.9	-37.5

	RESPONSE (YEARS 5-6)			
	Treatment	Increment	Difference	%
Net Basal Area PAI (sq. ft/a)	Control	3.1		
	200#N	2.8	-0.3	-9.7
	400#N	2.2	-0.9	-29.0
Gross Basal Area PAI (sq. ft/a)	Control	3.1		
	200#N	2.8	-0.3	-9.7
	400#N	2.1	-1.0	-32.3

INSTALLATION 298 LILLY LAKE
Region: C. Washington Ownership: Washington DNR Meridian: Willamette
Legal Description: T21N R20E Section 22 Veg. Series: GF Parent Material: Basalt

INITIAL CHARATERISTICS:

Age (years)	77	CCF	77.1
Trees per Acre	176.7	Relative Density Index	28.9
Basal Area (sq. ft/a)	90.0	Average Crown Length (ft.)	27.5
Total Volume (cu. ft./a)	2003	Average Crown Ratio (%)	53.4
Species Composition (% of total BA)		Mean Diameter (in.)	9.7
Ponderosa Pine 100		Site Height	57.6

Note: all increments have been adjusted to a common initial basal area of 90.0 sq. ft/a.

12 YEAR VOLUME GROWTH:

			RESPONSE	
	Treatment	Increment	Difference	% of Control
12-year Net Volume (cu. ft/acre)	Control	1300		
	200#N	1330	30	2.3
	400#N	856	-444	-34.2
12-year Gross Volume (cu. ft/acre)	Control	1286		
	200#N	1298	12	0.9
	400#N	1148	-138	-10.7

12 YEAR BASAL AREA GROWTH:

			RESPONSE	
	Treatment	Increment	Difference	% of Control
12-year Net Basal Area (sq. ft/acre)	Control	33.0		
	200#N	32.2	-0.8	-2.4
	400#N	16.5	-16.5	-50.0
12-year Gross Basal Area (sq. ft/acre)	Control	32.6		
	200#N	31.3	-1.3	-4.0
	400#N	29.0	-3.6	-11.0

PERIODIC ANNUAL INCREMENT (PAI) — BASAL AREA GROWTH:

	RESPONSE (YEARS 1-2)				RESPONSE (YEARS 3-4)		
	Treatment	Increment	Difference	%	Increment	Difference	%
Net Basal Area PAI (sq. ft/a)	Control	3.6			2.1		
	200#N	3.9	0.3	8.3	2.5	0.4	19.0
	400#N	3.1	-0.5	13.9	-1.0	-3.1	-147.6
Gross Basal Area PAI (sq. ft/a)	Control	3.6			2.0		
	200#N	3.8	0.2	5.6	2.5	0.5	25.0
	400#N	3.4	-0.2	-5.6	2.0	0	0

	RESPONSE (YEARS 5-6)				RESPONSE (YEARS 7-12)		
	Treatment	Increment	Difference	%	Increment	Difference	%
Net Basal Area PAI (sq. ft/a)	Control	3.1			2.6		
	200#N	3.4	0.3	9.7	2.1	-0.5	-19.2
	400#N	0.7	-2.4	-77.4	1.8	-0.8	-30.8
Gross Basal Area PAI (sq. ft/a)	Control	3.1			2.5		
	200#N	3.3	0.2	6.5	2.0	-0.5	-20.0
	400#N	3.0	-0.1	-3.2	2.0	-0.5	-20.0

INSTALLATION 299 LICK CREEK

Region: C. Washington **Ownership: Boise Cascade** **Meridian: Willamette**

Legal Description: T21N R16E Section 30 **Veg. Series: GF** **Parent Material: Sandstone**

INITIAL CHARATERISTICS:

Age (years)	76	CCF	138.0
Trees per Acre	236.7	Relative Density Index	49.5
Basal Area (sq. ft/a)	167.3	Average Crown Length (ft.)	28.1
Total Volume (cu. ft./a)	4820	Average Crown Ratio (%)	43.1
Species Composition (% of total BA)		Mean Diameter (in.)	11.4
Douglas-fir	1.8	Site Height	75.7
Ponderosa Pine	98.2		

Note: all increments have been adjusted to a common initial basal area of 167.3 sq. ft/a.

12 YEAR VOLUME GROWTH:

			RESPONSE	
	Treatment	Increment	Difference	% of Control
12-year Net Volume (cu. ft/acre)	Control	2470		
	200#N	2518	48	1.9
	400#N	3069	599	24.3
12-year Gross Volume (cu. ft/acre)	Control	2481		
	200#N	3064	583	23.5
	400#N	3178	697	28.1

12 YEAR BASAL AREA GROWTH:

			RESPONSE	
	Treatment	Increment	Difference	% of Control
12-year Net Basal Area (sq. ft/acre)	Control	44.1		
	200#N	39.7	- 4.4	-10.0
	400#N	59.9	15.8	35.8
12-year Gross Basal Area (sq. ft/acre)	Control	44.9		
	200#N	58.1	13.2	29.4
	400#N	63.0	18.1	40.3

PERIODIC ANNUAL INCREMENT (PAI) — BASAL AREA GROWTH:

	RESPONSE (YEARS 1-2)				RESPONSE (YEARS 3-4)		
	Treatment	Increment	Difference	%	Increment	Difference	%
Net Basal Area PAI (sq. ft/a)	Control	4.4			3.9		
	200#N	5.8	1.4	31.8	4.1	0.2	4.9
	400#N	5.1	0.7	15.9	5.0	1.1	28.2
Gross Basal Area PAI (sq. ft/a)	Control	4.2			3.7		
	200#N	5.4	1.2	28.6	5.2	1.5	40.5
	400#N	5.4	1.2	28.6	5.2	1.5	40.5

	RESPONSE (YEARS 5-6)				RESPONSE (YEARS 7-12)		
	Treatment	Increment	Difference	%	Increment	Difference	%
Net Basal Area PAI (sq. ft/a)	Control	3.8			3.3		
	200#N	6.6	2.8	73.7	1.1	-2.2	-66.7
	400#N	6.4	2.6	68.4	4.5	1.2	36.4
Gross Basal Area PAI (sq. ft/a)	Control	3.6			3.6		
	200#N	6.2	2.6	72.2	4.1	0.5	13.9
	400#N	6.7	3.1	86.1	4.7	1.1	30.6

INSTALLATION 300 SAGE FLAT
Region: C. Washington Ownership: Washington DNR Meridian: Willamette
Legal Description: T6N R12E Section 17 Veg. Series: GF Parent Material: Basalt

INITIAL CHARATERISTICS:

Age (years)	88	CCF	167.6
Trees per Acre	230.0	Relative Density Index	59.2
Basal Area (sq. ft/a)	214.1	Average Crown Length (ft.)	29.1
Total Volume (cu. ft./a)	7450	Average Crown Ratio (%)	38.0
Species Composition (% of total BA)		Mean Diameter (in.)	13.1
Ponderosa Pine	100	Site Height	90.8

Note: all increments have been adjusted to a common initial basal area of 214.1 sq. ft/a.

12 YEAR VOLUME GROWTH:

			RESPONSE	
	Treatment	Increment	Difference	% of Control
12-year Net Volume (cu. ft/acre)	Control	3315		
	200#N	3538	223	6.7
	400#N	3933	618	18.6
12-year Gross Volume (cu. ft/acre)	Control	3379		
	200#N	3742	363	10.7
	400#N	3936	557	16.5

12 YEAR BASAL AREA GROWTH:

			RESPONSE	
	Treatment	Increment	Difference	% of Control
12-year Net Basal Area (sq. ft/acre)	Control	54.9		
	200#N	53.3	-1.6	-2.9
	400#N	69.1	14.2	25.9
12-year Gross Basal Area (sq. ft/acre)	Control	57.4		
	200#N	60.8	3.4	5.9
	400#N	69.4	12.0	20.9

PERIODIC ANNUAL INCREMENT (PAI) — BASAL AREA GROWTH:

		RESPONSE (YEARS 1-2)			RESPONSE (YEARS 3-4)		
	Treatment	Increment	Difference	%	Increment	Difference	%
Net Basal Area PAI (sq. ft/a)	Control	5.3			5.5		
	200#N	5.7	0.4	7.5	6.7	1.2	21.8
	400#N	6.5	1.2	22.6	7.8	2.3	41.8
Gross Basal Area PAI (sq. ft/a)	Control	5.3			5.5		
	200#N	5.7	0.4	7.5	6.6	1.1	20.0
	400#N	6.5	1.2	22.6	7.8	2.3	41.8

		RESPONSE (YEARS 5-6)			RESPONSE (YEARS 7-12)		
	Treatment	Increment	Difference	%	Increment	Difference	%
Net Basal Area PAI (sq. ft/a)	Control	4.3			4.1		
	200#N	3.3	-1.0	-23.3	3.6	-0.5	-12.2
	400#N	4.9	0.6	14.0	5.1	1.0	24.4
Gross Basal Area PAI (sq. ft/a)	Control	4.3			4.5		
	200#N	4.2	-0.1	-2.3	4.6	0.1	2.2
	400#N	5.1	0.6	18.6	5.1	0.6	13.3