

Initial Evaluation of Shrub Transplanting Programs for Highway Slopes

The primary goal is to evaluate options in shrub transplanting programs used for erosion control on highway slopes, including: survivability of various low-growing, non-woody species, comparisons of various chemical and organic treatments, and the effectiveness of DriWater™ (containerized water bound in solid form, which slowly liquifies to provide drip irrigation to transplants).

Beginning in July of 1996, several shrub-transplanting test sites were established in Southwestern and Northern Idaho, primarily on cutslopes along US 95. The test plots were set-up to allow at least one repeat for many of the proposed treatments, which included local topsoil, MiracleGro™ fertilizer, Quattro Kiwi Power and Fertil-Fibers, Plant Health Care™ mycorrhizal inoculant, and combinations of some of these. Follow-up inventories and evaluations of the test plots used a plant-health rating scheme based on 1=healthy as shown by new growth, 2=some signs of stress, 3=significant signs of stress, 4=apparently dead.

Results and observations to date are summarized below.

1. Survival rates for shrubs planted with DriWater in summer 1996 were 78.5% for S. Idaho and 91.7% for N. Idaho with an overall rating of 155/179, or 86.6%;
2. In S. Idaho, plants treated with Kiwi Power had lower survival rates than those treated with MiracleGro; in N. Idaho, there was no apparent difference between the two treatments;
3. The addition of topsoil did not seem to provide any significant enhancement, whereas adding Fertil-Fibers consistently provided high ratings for the transplants that also received DriWater;
4. Best performing species were silver and big sage in S. Idaho, woods rose in N. Idaho; generally, the 1-gal. size transplants did better than the smaller 10 cu.inch transplants, regardless of plant type.
5. No clear advantages were apparent for the mycorrhizal inoculant treatment, though its plants generally scored well.
6. Survival rates for spring 1997 plantings in N. Idaho were 84% for DriWater plants, 65% for Non-DriWater plants.

Table 1. Results of Shrub Transplanting on Roadway Slopes in Southwestern Idaho

	Species	MiracleGro + Topsoil	K.Power + Topsoil	K.Power Only	MiracleGro + Mycorr.	K.Power + Mycorr.
<i>Horseshoe Bend Grade</i> (SH 55 mp 60.6) Planted July, 1996; each received 1 qt. of DriWater; field checked May, 1997. Total 26.	prairie sedge	12	44	14		
	winterfat	11	11	11		
	silver sage	11	11			
	big sage	11	11			
	western clematis			24	11	11
<i>N. of Weiser</i> (US 95 mp 89.6 & 91.5) Planted July, 1996; each received 1 qt. of DriWater; field checked May, 1997. Total 46.	prairie sedge	1111	4241	14		
	winterfat	22	11	22		
	bitterbrush	21	14	4		
	silver sage	1111	1111	1111		
	rabbitbrush	11	44	44		
	western clematis			11	11	44

Notes: Very little rainfall occurred from July through early September, 1996.

Overall performance: 47 #1's, 8 #2's, 15 #4's --- 55 of 70 survived (78.5%)

Field inspections in Sept.-Oct. of 1997 indicated similar "scores", with silver sage and big sage doing especially well.

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Table 2. Results of Shrub Transplanting on Roadway Slopes in Northern Idaho

	Species	MiracleGro + Topsoil	K.Power + Topsoil	K.Power Only	K.Power + Mycorr	Fert.Fib. Only
<i>N. of Genesee</i>						
(US 95 mp 332.5)	snowberry	11	11	11		
Planted July, 1996;	woods rose	11	11	11		1111111*
each received 1 qt. of	crp. oregon grape	11	11	11		
DriWater; field checked	western clematis	14	11	21		
May, 1997. Total 24.						
*Planted Nov. 1996, no DriWater.						
<i>N. of Moscow</i>						
(US 95 mp 346.8, 347.8)	snowberry**	4	3	4		
Planted July, 1996;	woods rose**	3	2	2		
each received 1 qt. of	crp. oregon grape**	1	1	3		
DriWater; field checked	western clematis**	3	4	4		
May, 1997. Total 17.	western clematis	44	3B	41		
**This site destroyed by mud slides in Jan. 1997; tabulated "scores" from Nov. 1996 site visit.						
B=buried by mud debris.						
<i>N. of Viola</i>						
(US 95 mp 354.6)	snowberry	11	41	11		111*
Planted July, 1996;	woods rose	11	11	11		
each received 1 qt. of	crp. oregon grape	12	11	22		
DriWater; field checked						
May, 1997. Total 18.						
*Planted Nov. 1996, no DriWater.						
<i>Mineral Mtn. Rest Area</i>						
(US 95 mp 370.6)	snowberry	12*	11	11	11	
Planted July, 1996;	woods rose	11	11	11*	11	
each received 1 qt. of	crp. oregon grape	1*1*	1*1*	21	1*1*	
DriWater; field checked						
May, 1997. Total 24.						
*Score from Nov. 1996 site visit before this plant was buried by mud debris.						
<i>W. of Sandpoint</i>						
(US 2 mp 16.0)	snowberry	11	11		11	Mir.Gro Only
Planted Sept., 1996;	woods rose	11	11	11	11	11
each received 1 qt. of	crp. oregon grape	11	11	11	22	11
DriWater; field checked	western clematis	BB	BB	BB		
May, 1997. Total 26.						

Notes: Very little rainfall occurred from July through September, 1996.

Overall performance: 85 #1's, 10 #2's, 5 #3's, 9 #4's --- 100 of 109 survived (91.7%)

Field inspections in Sept.-Oct. of 1997 indicated similar "scores", with woods rose doing especially well.

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Table 3. Results of Spring 1997 Shrub Transplanting in Northern Idaho.

	Species	MiracleGro Only	MiracleGro + K.Power	Fert.Fibers + K.Power	Fert.Fibers + Mycorr.	Fert.Fib. Only	None
<i>N. of Genesee</i> (US 95 mp 332.5) Planted April, 1997; field checked Aug., 1997. Total 70.	w. rose - DW	11	11	43	23	3311113	12
	w. rose - No DW	14	11	32	11	1314124	4241
	ore. grape - DW	1	2	4	2	4	3
	ore. grape - No DW	2	2	4	4	4	2
	gold currant - DW	1	2	4	2	413222	3
	gold currant - No DW	2	2	4	4	412144	3
<i>W. of Sandpoint</i> (US 2 mp16.0) Planted May, 1997; field checked Aug., 1997. Total 47.	w. rose - DW	141	211	1P1	111	114	112
	w. rose - No DW	443	322	143	211	344	222
	ore. grape - DW	4	2	2	3	3	4
	ore. grape - No DW	4	3	4	3	4	3

P=damaged by predator.

Notes: Above-average rainfall occurred from April through June, 1997.

Overall performance for Non-DriWater plants: 14 #1's, 15 #2's, 10 #3's, 21 #4's --- 39 of 60 survived (65.0%)

Overall performance for DriWater plants: 25 #1's, 13 #2's, 10 #3's, 9 #4's --- 48 of 57 survived (84.2%)

A statistical, two-sample hypothesis test comparing these two proportions clearly indicates that these proportions are significantly different from each other (the calculated value of the Z-statistic is very large: 29.4).