U of I School Forest

Progress Report

by

Raymond J. Boyd and Catherine P. Ritter

Previous studies (Boyd 1981) have shown various herbicides to be potentially useful as a site preparation technique. The possible combination of variables involved (herbicide, rate, time applied, method of application, vegetation present, conifer species involved, etc.) are many. There is a need for more information to bridge gaps and strengthen available results for various combinations. The purpose of this study is to determine the effects of three promising herbicides on seedling survival and growth in a pinegrass community.

Two sites on the University of Idaho School Forest were selected for study in June, 1981. One of the sites, stand #1-5-10, is located on a 10% slope with a northwest aspect at 3100' elevation. The habitat type is ABGR/PAMY. This stand was clearcut in the summer of 1980, broadcast-burned in the fall of 1980, and planted to 2-0 bare-root ponderosa pine stock in the spring of 1981. The other site, stand #2-5-1, has a 20% slope and is located on both the north and south aspects of a ridge. Habitat type varies from THPL/PAMY on the north slope to ABGR/PAMY on the south slope. The elevation is 2950'. This stand was clearcut and then planted to 1-0 containerized Douglas-fir and ponderosa pine stock on April 27 and 28, 1982. Pinegrass, huckleberry, snowberry and various forbs are the major understory species at both locations.

METHODS

Stand 1-5-10, 1981 plantings.

On June 11, 1981 this study was established by laying out 12 rows of 25 seedlings each. Treatments were arranged in a randomized design. Each treatment was replicated in three rows for a total of 75 trees/treatment. Each herbicide was applied to 4'x4' tree-centered plots using a Hudson pressurized backpack sprayer. Velpar was applied at 2 lbs (#) active ingredient (ai)/acre and atrazine at 4# ai/acre to unprotected trees. On June 25,1981 Roundup was applied to protected trees at 2# ai/acre.

Seedling survival and vigor were monitored in the fall of each year following treatment. Vegetation condition was ~~also~~ rated after the 1981 growing season. Seedling height was recorded in 1982 and 1983. In 1983, diameter at 15 cm was also measured.

Stand 1-5-10, 1982 plantings.

Three additional rows, 25 trees each, were planted on May 12, 1982. Additional trees were also planted into each Roundup-treated and control plot from 1981. Roundup was chosen because it produced the best results in 1981. The three new rows received a Roundup treatment at 2# ai/acre over protected trees. This provided the opportunity to compare a Roundup fallow and concurrent application.

Seedling survival and vigor were recorded in 1982 and 1983. Tree height and diameter were also recorded in 1983.

Stand 2-5-1.

On May 11, 1982, two areas (a north and a south aspect) consisting of 12 rows, each with 20-25 trees/row were delineated. One area, the north aspect, contained Douglas-fir seedlings, 25 trees/row. The south aspect area contained 20 ponderosa pine seedlings/row. Three herbicides and control were applied to three rows each for a total of 60-75 trees/treatment. On May 18, 1982, Velpar liquid applications were applied at 2# ai/acre to 4'x4' tree-centered plots using a Hudson pressurized backpack sprayer. Velpar granular, 2# ai/acre, was applied using a homeade "shaker" jar. Roundup was applied on June 8 at 2# ai/acre over protected trees.

Tree survival and vigor were measured each fall following treatment. Competiton control was observed after the first growing season. Seedling height and diameter were recorded in 1983.

RESULTS

Stand 1-5-10, 1981 plantings.

1981. Results from survival, vigor and vegetation measurements show Roundup was the most effective treatment. First year survival was high. All treatments had better than 95% survival. Velpar was best (100%), control was worst (96%). The Roundup treatment had the highest percentage of good vigor trees (93%), atrazine had the lowest (77%). Roundup also produced the best vegetation control. Velpar had the poorest vegetation control results.

1982. Roundup continued to be the most effective herbicide in regard to tree growth and vegetation control. Survival dropped to a

high of 85% for Roundup and Velpar treatments and a low of 73% for controls. When missing or trees dead due to animals were deleted from the analysis, survival was 100% for all treatments except controls (94%). Roundup continued to have the highest percentage of good vigor trees (98%) while atrazine had the lowest (91%). Roundup treatments also had the highest mean heights while controls had the lowest.

1983. In 1983, statistical analysis using Duncan's Multiple Range Test was completed for each dependant variable at the 5% confidence level. Roundup and Velpar proved to be significantly better than the control in affecting tree growth characteristics. When missing or trees dead due to animals were deleted, survival was highest on Velpar plots (98%) and lowest on control plots (88%). There were no significant differences. But, when 1983 height was analyzed, Roundup was significantly better than controls. Diameter was significantly larger on Velpar plots than controls. Aggregate height (%survival*height*100) and plantation growth index "pgi" (%survival*height*diameter*100) were significantly higher in Roundup and Velpar treatments than controls. Roundup continued to have the most trees with good vigor. This was significantly more than atrazine and Velpar. Velpar and atrazine-treated trees had over twice as many trees that produced a second flush (33%) than Roundup or control (15% and 11%).

Stand 1-5-10, 1982 plantings.

1982. Seedling survival, excluding missing trees and dead due to animals, was high (99-100%). Controls had the highest percentage of good vigor trees (85%) while Roundup concurrent had the least (73%).

1983. Roundup treatments produced better results than controls although this trend was not statistically significant. The Roundup concurrent treatment had the highest survival (100%) while Roundup fallow had the lowest (94%). There were no significant differences. Roundup concurrent also had the best height, diameter, aggregate height and pgi. Control results were lowest for each of these variables except aggregate height. Again, there were no significant differences. Roundup fallow had significantly more good vigor trees than Roundup concurrent. This could be due to the fact that 48% of the Roundup concurrent plots had pocket gopher activity as compared to 15% and 18% for control and Roundup fallow plots.

Stand 2-5-1, Douglas-fir.

1982. Seedling survival was highest in Roundup and control treatments (99%) and lowest in Velpar granular (67%). The highest percentage of good vigor trees was found in Velpar liquid plots (89%). The lowest percentage was found in Roundup and Velpar granular treatments (81%). Roundup produced the best vegetation control. Velpar liquid did the poorest job of controlling competition.

1983. Velpar granular consistently produced the poorest results but none of the remaining treatments stood out as solely the best treatment. Survival in controls (96%), Roundup (93%), and Velpar liquid (84%) was significantly higher than Velpar granular (56%). Control trees also had the highest average height. Velpar granular trees had the lowest heights. Controls also had the highest percentage of good vigor trees. Velpar liquid treatments had the largest mean diameter

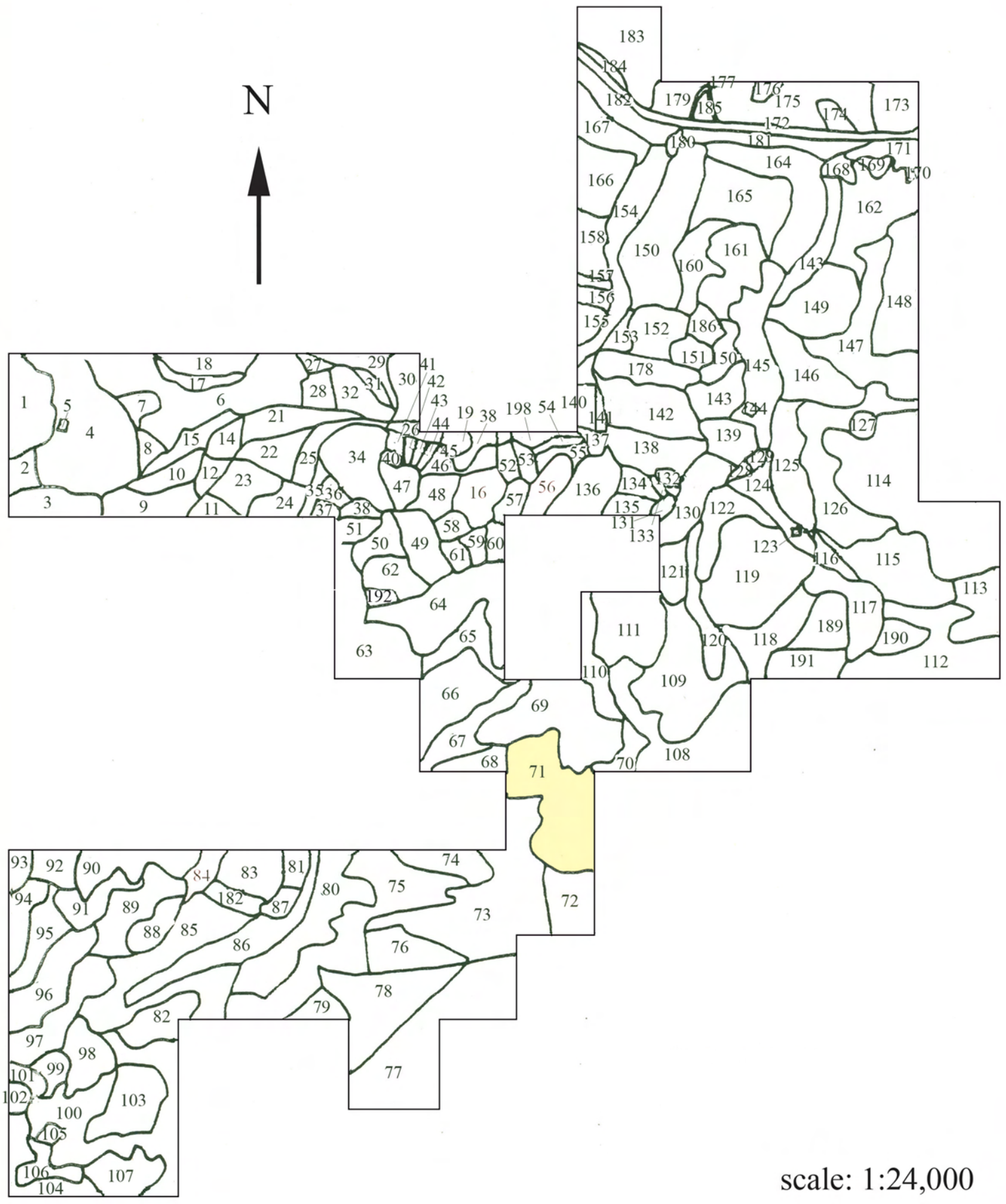
while Velpar granular had the smallest. There were no significant differences for height, vigor or diameter means. Aggregate height was highest in controls. All treatments were significantly better than Velpar granular. Pgi was highest in Roundup treatments, significantly better than Velpar granular.

Stand 2-5-1, ponderosa pine.

1982. Seedling survival was 100% in all treatments except Velpar granular (90%). The highest percentage of good vigor trees was found in Roundup treatments (85%) while the lowest was in Velpar granular plots (69%). The best vegetation control was produced by Roundup and the poorest by Velpar liquid treatments.

1983. Although controls had the highest survival means, Roundup plots produced better seedling growth than other treatments. Velpar granular was not quite as toxic to ponderosa pine as Douglas-fir but results were still poorer than Velpar liquid treatments. Survival in controls (100%) was significantly better than in Velpar granular treatments (89%). The highest heights were obtained with Roundup; the lowest heights in controls. There were no significant differences. The largest mean diameter was also obtained with a Roundup treatment, the lowest with a control. This difference was significant. Roundup plots produced the highest percentage of good vigor trees as well as the highest aggregate height and pgi. Velpar granular had the fewest good vigor trees and the lowest aggregate height. Controls had the lowest pgi. These differences were not significant.

Stand Map of the Flat Creek Unit, College of Forestry, Experimental Forest 1986



By finding the six digit stand number on the table for the map, you are able to then find the two digit stand number on the map. This enables you to locate where the research took place on the experimental forest. This map and table came from *A Combined Report For Fiscal Years 1980 Through 1986*

By
Forest Manager,
Harold Osborne
The maps were edited by Rachel Voss

Table 6-1. Continued

STAND #	MAP #	STAND DESCRIPTION	ACRES	HARVEST ACTIVITY CODE	FY HARVEST	SLASH/ SITE PREP CODE	FY PREP	REFOREST CODE	FY REFOREST	LOGGING METHOD
10114	174	MINI SKIDDER BY RAILROAD	4.2	T	80	L&S	86	NR	86	G
10406	56	ZIMMERMAN SEED TREE #2	13.7	ST	80	BB	81	NR		
10408	16	ZIMMERMAN SEED TREE #1	12	ST	80	BB	81	NR	81	C
10411	48	ZIMMERMAN CLEARCUT	8	CC	80	BB	81	P	81	C
10510	71	CLEARCUT / RELOG	44	CC	80	BB	81	P	81	G
10601	96	AMOEBA CLEARCUT	22	CC	80	BB	81	P	81	G
10602	102	BENNY'S LINE STRIP	4	CC	80	BB	81	P	81	C
10606	99	SEED TREE	5	ST	80	DP&B	80	NR	80	G
10608	95	CEDAR POLE SALE	18	CC	80	BB	82	P	82	G
10609	84	SEED TREE WITH PEELERS	15	ST	80	BB	81	NR	81	G
10609	89	SEED TREE NORTH	6	ST	80	DP&B	81	NR	81	G

TABLE 6. AN EXPLANATION OF CODES USED IN TABLES 6-1 AND 6-2.

HARVEST ACTIVITY CODES

CC - CLEARCUT
SHWD - SHELTERWOOD
ST - SEEDTREE
SE - SELECTION
T - THINNING
LT - LOW THINNING
N - NO HARVESTING
IMP - IMPROVEMENT CUT
P - CUT PRIOR TO FY80

REFORESTATION CODES

P - PLANTED
NR - NATURAL REGENERATION
IP - INTERPLANT

SITE PREPARTAION CODES

BB - BROADCAST BORD
DP&B - DOZER PILE AND BURN
L&S - LOP AND SCATTER
JPB - JACKPOT BURN
HPB - HAND PILE AND BURN

LOGGING METHOD CODES

C - CABLE LOGGING
G - GROUND SKIDDING
H - HORSE LOGGING

East Hatter Creek Stand Map 1987

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LOGGING METHOD CODES

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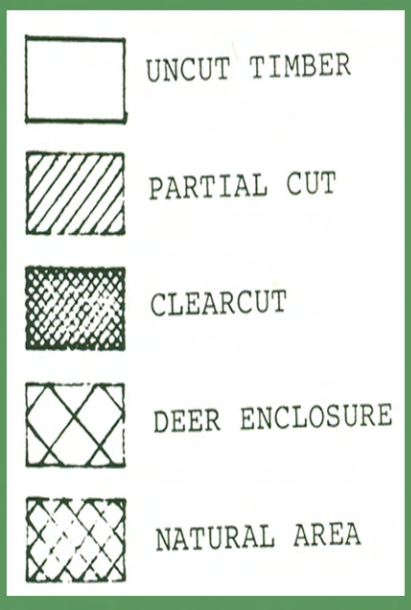

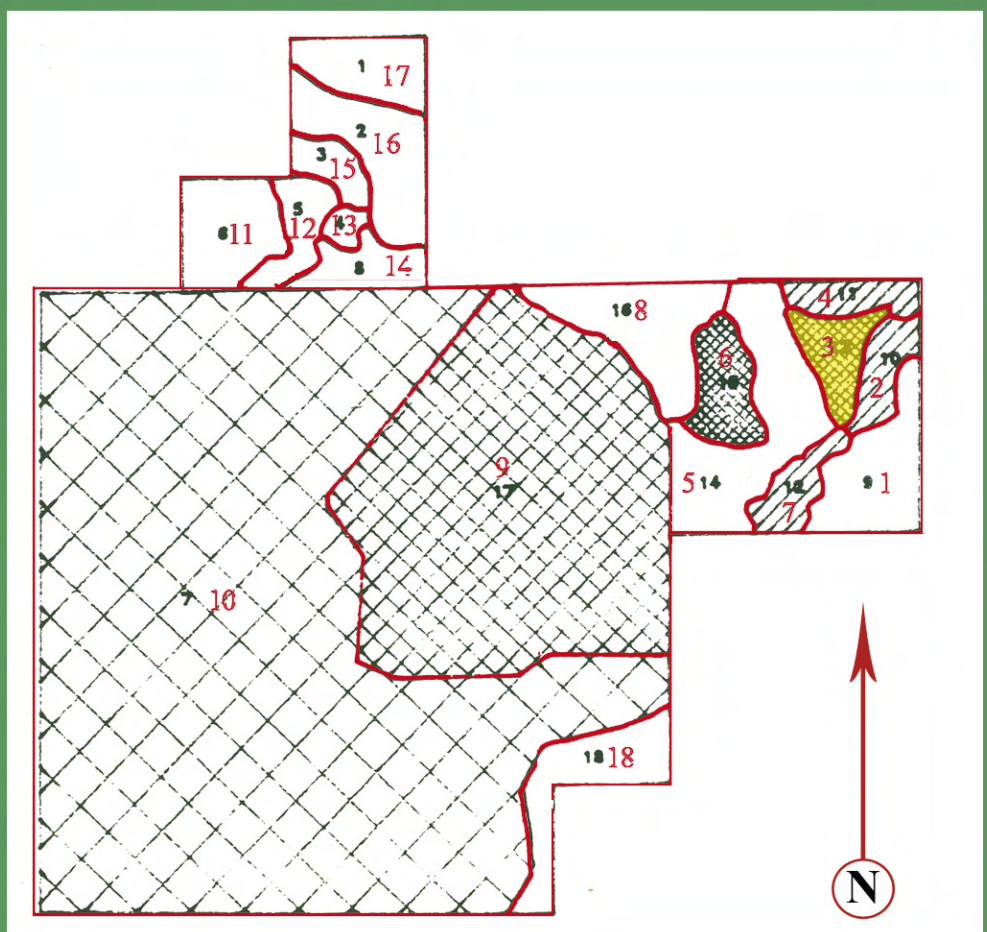

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The first number is the unit, second number is the subcomponents, and the third number is the stand number.

so... find the 3 digit stand number, and then find the 2 digit map number on the maps to locate a study area.

TABLE 6-1. MANAGEMENT ACTIVITY RECORD FOR STANDS OF THE EXPERIMENTAL FOREST
COLLEGE OF FORESTRY, RANGE AND WILDLIFE, UNIVERSITY OF IDAHO

STAND #	MAP #	STAND DESCRIPTION	ACRES	HARVEST ACTIVITY CODE	FY HARVEST	SLASH/ SITE PREP CODE	FY PREP	REFOREST CODE	FY REFOREST	LOGGING METHOD
10101	185	SILVI DEMO SHELTERWOOD	6	SHWD	75	DP&B	75	NR	75	G
10102	151	SILVI DEMO SEEDTREE	5	ST	75	DP&B	75	NR	75	G
10106	150	DIAMETER LIMIT CUT		P	75					
10403	60	SECOND CLEARCUT STRIP	4	CC	79	BB	79	NR	81	C
10404	61	FIRST CLEARCUT STRIP	4	CC	79	BB	81	NR&P		C
10114	174	MINI SKIDDER BY RAILROAD	4.2	T	80	L&S	86	NR	86	G
10406	56	ZIMMERMAN SEED TREE #2	13.7	ST	80	BB	81	NR		
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10609	84	SEED TREE WITH PEELERS	15	ST	80	BB	81	NR	81	G
10609	89	SEED TREE NORTH	6	ST	80	DP&B	81	NR	81	G
10106	150	GF SHELTERWOOD	8	SHWD	81	DP&B	83	NR	83	G
10416	38	CLEARCUT ABOVE 10418	2	CC	81	DP&B	82	P	82	G
10417	37	SPICER'S LINE SKID CLEARCUT	2.7	CC	81	BB	82	P	82	C
10418	36	SPICER'S SHELTERWOOD LINE SKID	6	SHWD	81	BB	83	NR	83	C
10612	92	SEED TREE	11	ST	81	DP&B	81	NR	81	G
10617	88	SPICER SHELTERWOOD-GROUND	6	SHWD	81	DP&B	83	NR	83	G
11203	149	CLEARCUT	35.8	CC	81	BB	82	P	82	G&C
20501	3	CLEARCUT 20501	14.8	CC	81	BB	82	P	82	C&G
30501	66	MINI SKIDDER WEST HATTER	7.8	T	81					G
10508	66	SQUASH PIPE	35	CC/OR	82	DP&B	83	P	83	G
10803	121	OLD CEDAR SALE	11.5	CC	82	DP&B	83	P	83	G
11001	82	CLEARCUT	20	CC	82	BB	83	P	83	G
20502	6	BASALT HILL CLEARCUT	17	CC	82	BB	83	P	83	G

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