

A SYSTEM FOR SUMMARIZING SUPERIOR TREE RECORDS AND STATUS INFORMATION

Richard G. Miller¹

The Eastern Region of the U.S. Forest Service encompasses 20 states extending from Maine to Minnesota, south to Missouri, and east to Maryland. Many organizations within this Region, including states, federal agencies, industries, colleges and universities, are conducting forest tree improvement programs.

Varying in scope and intensity, these programs incorporate a wide range of species. Due to financial restraints, and/or political boundaries, the number of trees (genetic base) included in several of these programs is relatively small. The genetic base of these programs could be enlarged if program coordinators were aware of the plant materials being used in similar programs.

There is currently no simple way to keep informed of the plant materials or progress in other programs. One method of keeping up-to-date is by participating in discussions and field tours during conferences such as NEFTIC; another is through personal correspondence. There seems to be a need for a system that summarizes superior tree records and status information, thus providing an efficient means of keeping participating cooperators informed of selected plant materials and program status on a Regional basis. Arrangements could easily be made for the exchange of information and plant materials between informed parties.

A data processing system has been developed in the Eastern Region for maintaining records on all aspects of their tree improvement program. Two of these programs, the Superior Tree Register and Superior Tree Status Report, provide current information on the more than 3,000 selections involved in the Region's tree improvement program. These computer programs could be used to provide interested cooperators throughout the Region with up-to-date information on all selections and their use. The Superior Tree Register and Status Report programs are written in FORTRAN IV, and run on a UNIVAC 1108 computer at Fort Collins, Colorado. Source documents include the Softwood Superior Tree Candidate Report and the Hardwood Superior Tree Candidate Report, shown in Exhibits 1 and 2, respectively.

Each tree is recorded on an individual form for inclusion in the program. Data essential to running the programs are shown on the sample form in Exhibits 1 and 2, and include state code, tree number, species code, and status codes. Another code could be included to identify a particular cooperator within a state. An accession number, while critical

¹ Regional Geneticist, USDA Forest Service, Eastern Region, Milwaukee, WI 53203.

SOFTWOOD SUPERIOR TREE CANDIDATE REPORT		Accession No. (2-5) <u>600</u>	Tree No. (14-18) <u>N 66</u>	Species (19-21) <u>94</u>
State (6-7) <u>55</u>		National Forest (8-9) <u>6</u>		
County (10-12) _____		Ranger District (13) _____		
Tree Located By _____				
Title _____				
Date _____				
Tree is marked with _____ paint, ribbon (Color) (Cross out one)				
Other _____ (Describe mark)				
Bearing and distance from reference point: _____ _____ _____				
Name of landowner _____				

SELECTED TREE RATING					COMPLETE THE FOLLOWING FOR THE SELECTED TREE ONLY	
	(1)	(2)	(3)	(4)		
3 Largest Trees (Same species) within 66 feet	Age (At DBH)	Total Height (Feet)	DBH (Nearest 1/10 in.)	Stem Volume (cu. ft.)	(5) Selection Objective: Primary (52-53) _____ Secondary (54-55) _____	
A					(6) Live Crown: Length (59-60) _____ Diameter (61-62) _____	
B					(7) Branch Angle (63) _____	
C					(8) Self Pruning (64-65) _____	
Total					(9) Seed Crop (66) _____	
Average					(10) Elevation (67-70) _____	
Selected Tree	(22-24)	(25-27)	(31-33)	(34-36)		
% Superiority		(40-42)		(46-48)		

INITIAL SCREENING		FINAL SCREENING	
Candidate	<input type="checkbox"/> Accepted <input type="checkbox"/> Rejected	Candidate	<input checked="" type="checkbox"/> Accepted <input type="checkbox"/> Rejected
Examined by _____		Examined by <u>R.G. Miller</u>	
Title _____	Date _____	Title _____	Date <u>11/65</u>
Remarks _____		Remarks _____	(71-74) Mo. Yr.
		STATUS <u>2</u> <u>1</u> <u>6</u> <u>1</u> <u>1</u> <u>75</u> <u>76</u> <u>77</u> <u>78</u> <u>79</u>	

(Over)

HARDWOOD SUPERIOR TREE CANDIDATE REPORT		Accession No. 4321 <small>(2-5)</small>	Tree No. <small>(14-18)</small> CH316	Species <small>(19-21)</small> 371
State <small>(6-7)</small> 55		National Forest <small>(8-9)</small> _____		
County <small>(10-12)</small> _____		Ranger District <small>(13)</small> _____		
Tree Located By _____				
Title _____				
Date _____				
Tree is marked with _____ paint, ribbon <small>(Color) (Cross out one)</small>				
Other _____ <small>(Describe mark)</small>				
Bearing and distance from reference point: _____ _____ _____				
Name of landowner _____				

SELECTED TREE RATING							COMPLETE THE FOLLOWING FOR THE SELECTED TREE ONLY
	(1)	(2)	(3)	(4)	(5)	(6)	
3 Largest Trees <small>(Same species) within 66 feet</small>	Age <small>(At DBH)</small>	Total Height <small>(Feet)</small>	Ht. to 8" Top <small>(Feet)</small>	DBH <small>(Nearest 1/10 in.)</small>	Stem Volume <small>(cu. ft.)</small>	Apical Domin. <small>(%)</small>	(7) Selection Objective: Primary <small>(52-53)</small> _____ Secondary <small>(54-55)</small> _____
A							
B							(8) Roundness Ratio <small>(56-58)</small> _____
C							(9) Crown Diameter <small>(61-62)</small> _____
Total							(10) Branch Angle <small>(63)</small> _____
Average							(11) Seed Crop <small>(66)</small> _____
Selected Tree	<small>(22-24)</small>	<small>(25-27)</small>	<small>(28-30)</small>	<small>(31-33)</small>	<small>(34-36)</small>	<small>(37-39)</small>	(12) Elevation <small>(67-70)</small> _____
% Superiority		<small>(40-42)</small>	<small>(43-45)</small>		<small>(46-48)</small>	<small>(49-51)</small>	

ACTION	
<p style="text-align: center;">Initial Screening</p> <p>Candidate <input type="checkbox"/> Accepted <input type="checkbox"/> Rejected</p> <p>Examined by _____</p> <p>Title _____ Date _____</p> <p>Remarks _____</p>	<p style="text-align: center;">Final Screening</p> <p>Candidate <input checked="" type="checkbox"/> Accepted <input type="checkbox"/> Rejected</p> <p>Examined by <u>R. G. Miller</u></p> <p>Title _____ Date <u>7/74</u> <small>(71-74) Mo. Yr.</small></p> <p>Remarks _____</p> <p style="text-align: center; font-size: 1.5em;">STATUS <u>1</u> _____ 75 76 77 78 79</p>

(Over)

to running the programs, must be assigned to each selection by the organization coordinating the work. Other desirable information includes the county code, selection objective and statistics on the selected tree. Status codes are shown in Exhibit 3.

Once a Superior Tree Candidate Report has been completed and the data entered into the computer files, the tree is automatically included in both the Superior Tree Register and the Superior Tree Status Report. New selections can be added to the Register as often as desired; however, an annual run would normally be satisfactory. Status information on trees already included can be updated when new additions are made. Zone Geneticists update their copies of the Status Report by placing Xs or crossing out information in the appropriate positions with a red pencil. Corrected Status Reports are sent to the Regional Geneticist along with the new additions. He assembles the data, has it keypunched, and makes the run.

The Superior Tree Register provides a list of all trees included in the tree improvement program, along with pertinent data on each tree. The trees are grouped by National Forests (or states), and by species within a National Forest. A new page is started for each species. A sample page from the Register (Exhibit 4) shows a partial list of white spruce selections on the Nicolet National Forest.

The Status Report (Exhibit 5) shows current status information for the trees in Exhibit 4. The report includes basic location and tree identification information. It shows if the tree is alive or dead, how it has been used in the overall program -- seed orchard, evaluation plantations, etc., if seed has been collected from an individual tree (one X), if there is sufficient seed in storage to establish evaluation plantations (two Xs), and which trees are included in other programs with different (alias) numbers.

This system has been used to keep track of selected trees for the past four years. It has been a real help in keeping people informed of progress in the Region's tree improvement program and in planning work schedules. This same system could be used by all interested organizations within the Eastern United States and Canada to keep the subscribing parties informed of the work being performed by others, and to provide a record of plant materials used in the other programs. This record makes arranging for the exchange of plant materials between cooperators relatively easy.

Any organization interested in using this system need only enter their selected tree data on the Softwood or Hardwood Superior Tree Report Forms. State and Private Forestry personnel would assist in the effort if there were any difficulties. Region 9 would assemble the data and make the computer runs. Each cooperator would receive two copies of the printout containing information on all the cooperators' programs. It would then be up to individual cooperators to contact other parties and arrange for the exchange of plant materials. All tree improvement programs could benefit from the availability of this basic data.

EXHIBIT 3, SUPERIOR TREE STATUS REPORT CODES

Enter the appropriate status code in columns 75 - 79

Column 75

1. Alive
2. Alive - Grafts
3. Alive - Cuttings
4. Alive - Grafts and Cuttings
5. Dead
6. Dead - Grafts
7. Dead - Cuttings
8. Dead - Grafts and Cuttings

Column 76

1. Clonal Orchard
2. ½ Sib Orchard
3. Full Sib Orchard
4. Clonal and ½ Sib Orchard
5. Clonal and Full Sib Orchard
6. 1 Sib and Full Sib Orchard
7. Clonal, ½ Sib, and Full Sib Orchard

Column 77

1. Breeding Arboretum (BA)
2. Reserve
3. ½ Sib Seed in Storage
4. BA and Reserve
5. BA and 1 Sib Seed in Storage
6. Reserve and 1 Sib Seed in Storage
7. BA, Reserve, and ½ Sib Seed in Storage

Column 78

1. Full Sib Seed in Storage
2. ½ Sib Evaluation Plantation (EP)
3. Full Sib Evaluation Plantation
4. Full Sib Seed in Storage and 1 sib in EP
5. Full Sib Seed in Storage and Full Sib in EP
6. 1/2 Sib EP and Full Sib EP
7. Full Sib Seed in Storage, 1 sib EP, and Full sib EP

Column 79

1. Sufficient Half-Sib Seed in Storage
2. Sufficient Full-Sib Seed in Storage
3. Sufficient Half-Sib and Full-Sib Seed in Storage
4. Tree has Alias Number(s)
5. Sufficient Half-sib Seed and Alias Number(s)
6. Sufficient Full-Sib Seed and Alias Number(s)
7. Sufficient Half-Sib and Full-Sib Seed and Alias Number(s)

9 = None of above (75, 76, 77, 78 and 79) for update.

EXHIBIT 4.

SUPERIOR TREE LIST BY FOREST, SPECIES, AND ACCESSION NUMBER

MAY 6, 1975

ACCESS NO.	S	ST-CTY- E	TREE NO.	A	HEIGHT TOT-MER E (FEET)	D	VOL (CU FT)	APC (%)	% SUPERIORITY HEIGHT TOT-MER	OBJECTV PRI-SEC	ROUND RATIO	CROWN LEN-DIA	BRCH ANGL	SELF PRUN	SEED CROP	ELEV (FT)	DATE MO/YR						
596	94	55-83-6-4	N 7	69	76	0	15.9	45	0	19	0	55	0	4	6	.00	45 11	1	0	1	1273	1/66	
597	94	55-41-6-1	N 36	80	93	0	17.8	69	0	24	0	64	0	4	6	.00	51 12	1	0	1	0	1/66	
598	94	55-41-6-5	N 43	97	102	0	23.8	132	0	37	0	146	0	4	6	.00	62 20	1	0	1	0	1/66	
599	94	55-37-6-3	N 63	78	91	0	16.6	60	0	25	0	71	0	4	6	.00	63 14	1	0	1	0	1/66	
600	94	55-41-6-1	N 66	86	96	0	17.8	71	0	23	0	48	0	4	6	.00	58 13	1	0	1	0	11/65	
601	94	55-41-6-5	N 79	73	81	0	15.8	53	0	16	0	61	0	4	6	.00	58 18	1	11	2	0	1/66	
602	94	55-41-6-5	N 82	78	81	0	14.9	41	0	21	0	85	0	4	6	.00	47 10	1	0	1	0	1/66	
603	94	55-41-6-2	N 83	55	71	0	12.9	32	0	16	0	77	0	4	6	.00	48 10	1	0	1	0	5/66	
604	94	55-41-6-2	N 84	53	71	0	14.8	36	0	20	0	44	0	4	6	.00	46 15	1	10	1	0	5/66	
605	94	55-41-6-2	N 85	70	70	0	18.0	52	0	21	0	58	0	4	6	.00	45 15	1	3	1	0	5/66	
606	94	55-41-6-1	N 86	68	79	0	21.7	86	0	18	0	104	0	4	6	.00	54 16	1	15	1	0	5/66	
607	94	55-41-6-1	N 87	56	73	0	16.2	43	0	12	0	26	0	4	6	.00	39 15	1	14	1	0	5/66	
608	94	55-41-6-1	N 88	56	76	0	13.0	26	0	22	0	44	0	4	6	.00	31 13	1	7	1	0	5/66	
609	94	55-41-6-1	N 89	60	74	0	15.8	41	0	14	0	86	0	4	6	.00	40 17	1	2	1	0	5/66	
610	94	55-41-6-1	N 90	54	61	0	10.9	17	0	33	0	88	0	4	6	.00	33 13	1	12	3	0	12/66	
611	94	55-41-6-2	N 91	138	81	0	18.8	66	0	45	0	128	0	4	6	.00	46 15	1	2	4	0	12/66	
612	94	55-41-6-1	N 92	116	82	0	20.0	75	0	19	0	53	0	4	6	.00	39 15	1	0	1	0	1/67	
613	94	55-85-6-1	N175	65	78	0	12.4	26	0	15	0	62	0	4	3	.00	58 9	1	20	4	1700	3/68	
614	94	55-41-6-1	N176	47	78	0	12.1	26	0	20	0	24	0	4	6	.00	58 11	1	20	1	1600	3/68	
3092	94	55-83-6-4	DN701	0	0	0	.0	0	0	0	0	0	0	1	6	.00	0 0	0	0	0	0	0	12/74
3093	94	55-83-6-4	DN702	0	0	0	.0	0	0	0	0	0	0	1	6	.00	0 0	0	0	0	0	0	12/74
3094	94	55-83-6-4	DN703	0	0	0	.0	0	0	0	0	0	0	1	6	.00	0 0	0	0	0	0	0	12/74
3095	94	55-83-6-4	DN704	0	0	0	.0	0	0	0	0	0	0	1	6	.00	0 0	0	0	0	0	0	12/74
3096	94	55-83-6-4	DN705	0	0	0	.0	0	0	0	0	0	0	1	6	.00	0 0	0	0	0	0	0	12/74
3097	94	55-83-6-4	DN706	0	0	0	.0	0	0	0	0	0	0	1	6	.00	0 0	0	0	0	0	0	12/74

EXHIBIT 5.

SUPERIOR TREE STATUS REPORT - MAY 3, 1975

ACC NO	S P E C	ST- CTY- NF -DIST	TREE LIVE	VEGETATIV PROPAGAT. GRAFT CUT	SEED CLD NAL	ORCHARD 1/2 SIB	BRED FULL SIB	BRED ARB	RES-ERVE	SEED 1/2 SIB	STOR FULL SIB	PRDG 1/2 SIB	TEST FULL SIB	ALIAS NO.
596	94	55-83-0-4	N 7	YES	X				X	XX				
597	94	55-41-0-1	N 36	YES	X				X	XX				
598	94	55-41-0-5	N 43	YES	X				X	XX	XX			
599	94	55-37-0-3	N 63	YES	X					XX				
600	94	55-41-0-1	N 66	YES	X				X	XX	X			
601	94	55-41-0-5	N 79	YES	X					XX				
602	94	55-41-0-5	N 82	YES	X					X	X			
603	94	55-41-0-2	N 83	YES	X					X	X			
604	94	55-41-0-2	N 84	YES	X					XX				
605	94	55-41-0-2	N 85	YES	X					XX				
606	94	55-41-0-1	N 86	YES	X					XX				
607	94	55-41-0-1	N 87	YES	X					XX				
608	94	55-41-0-1	N 88	YES	X					XX	X			
609	94	55-41-0-1	N 89	YES	X					XX	X			
610	94	55-41-0-1	N 90	YES	X					XX	X			
611	94	55-41-0-2	N 91	YES	X					X				
612	94	55-41-0-1	N 92	YES	X				X	XX				
613	94	55-85-0-1	N175	YES						XX				
614	94	55-41-0-1	N176	YES						XX				
3092	94	55-83-0-4	DN701	YES	X									X
3093	94	55-83-0-4	DN702	YES	X									X
3094	94	55-83-0-4	DN703	YES	X					XX	X			X
3095	94	55-83-0-4	DN704	YES	X					X				X
3096	94	55-83-0-4	DN705	YES	X					X				X
3097	94	55-83-0-4	DN706	YES	X					X	X			X
3098	94	55-83-0-4	DN707	YES	X					X	X			X
3099	94	55-83-0-4	DN708	YES	X					X	X			X
3100	94	55-83-0-4	DN709	YES	X					X	X			X
3101	94	27-61-0-4	DN710	YES	X					X				X
3102	94	27-61-0-4	DN711	YES	X					X				X
3103	94	27-61-0-4	DN712	YES	X					X				X
3104	94	27-61-0-4	DN713	YES	X					X				X
3105	94	55-83-0-4	DN714	YES	X									X
3106	94	55-83-0-4	DN715	YES	X									X
3107	94	55-83-0-4	DN716	YES	X									X
3108	94	55-83-0-4	DN717	YES	X									X
3109	94	23-0-0-4	DN718	YES	X									X
3110	94	23-0-0-4	DN719	YES	X									X
3111	94	23-0-0-4	DN720	YES	X									X
3112	94	23-0-0-4	DN721	YES	X									X
3113	94	75-0-0-4	DN722	YES	X									X
3114	94	75-0-0-4	DN723	YES	X									X
3115	94	75-0-0-4	DN724	YES	X									X
3116	94	75-0-0-4	DN725	YES	X									X
3117	94	75-0-0-4	DN726	YES	X									X
3118	94	75-0-0-4	DN727	YES	X									X
3119	94	75-0-0-4	DN728	YES	X									X
3120	94	75-0-0-4	DN729	YES	X									X