However, the risk of coating seeds with chemicals against rodents and fungi is acceptable when measured against the benefits of obtaining more uniform and healthier seedlings at the end of the first growing season.

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Rust resistance of Populus clones compared in Wisconsin study

by

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Susceptibility to diseases is an important factor when choosing members of a species for maximum yield or intensive culture systems. One potentially important pathogen of poplars in such systems is *Melampsora* leaf rust.'

Schreiner[2] *pointed out that early* and heavy *Melampsora* rust infestation markedly decreased the growth of poplar clones and has been conducive to *Dothichiza* attack. Moreover, highly susceptible hybrids have been almost completely defoliated by rust by mid August and most of them die in 3 to 5 years.

Clonal variation in *Melampsora* rust resistance has been reported.[3] It has also been demonstrated that because variation within *Melampsora* species is common, studies and evaluations of rust resistance ritual he conducted in the *region where the Populus clones are to* be grown[4].

As part of an initial selection program for rapid growing, high yielding trees for fiber production in the northern Lake States area, *32 Populus* clones were evaluated for susceptibility to

%fed am psora.

Cuttings were obtained from various sources and planted in closely spaced rows iu an irrigated nursery at Rhinelander, ~'is. By midsummer of 1972, the 2-year-old cuttings had shoots 5 to *12 feet tall, and as early as mid-July,* one clone was exhibiting marked susceptibility to east.

At four dates-August 17, September 1, September 8, and September 25-the trees were evaluated, using the rating system developed by Schreiner (tables 1 and 2). In this system, leaf diagrams are used to classify leaves into three infection classes-light, medium. or heavy-and the leaf ratings combined with an estimate of the percentage of the infected leaves on the tree to give a numerical index of infection. Tinting and severity of infection are used as direct indicators of rust susceptibility.

1- Arthur L. Shipper. Jr. and D.H. Dawson. Poplar leaf rust-problem in maximum wood fiber production. (Manuscript in preparation.)

[2]*Ernst J. Schreiner. Rating; poplars for Melampsora leaf rust infection. USDA Forest* Service, Northeast. For. Exp. Stn. Res. Note NE-90, 3p., illus. 1959.

3 C. M. Nagel. (Abstr.) Leaf rust resistance within certain species and hybrids of Populus. Phytopathology 39:p.16.1949.

4 Food and Agriculture Organization of the United States. Poplars in forestry and land use FAO Forestry and Forest Products Studies No. 12. Rome, Italy. 511 p., illus. 1958.

TABLE 2.—*Melampsora rust resistance ratings of 32 Populus clones at Rhinelander, Wis. (Arraned in general order of apparent rust resistance based on sum of last three evaluations)*

Parentage	Source number	Received from	Supplier's number(s)	Numerical rating (table 1) 8/17/72	9/1/72	9/8/72	9/25/72
Low Susceptibility							
Populus alba L.	4877	Beltsville,[1] Md.	PI 343437	0	0	0	0
Populus cv. Charkowiensis x *P.* cv. Caudina	5271	Upper Darby, Pa.[3]	NE-19	0	0	0	0
Populus nigra L. x P. *laurifolia* Ledeb.	5272	Upper Darby, Pa.[3]	NE-1	0	0	1	1
Populus alba L. x *P. grandidentata* Michx.	5339	Ames, Iowa[5]	---	1	1	1	1
Populus cv. Betulifolia x *P. trichocarpa* Torr. & Gray	5331	Upper Darby, Pa.[3]	NE-229	0	0	1	5
Populus cv. Betulifolia x *P. trichocarpa* Torr. & Gray	5332	*Upper Darby, Pa.*[3]	NE-98	0	0	1	5
Populus x *euramericana* (Dode) Guinier cv. I-214	4878	Beltsville,[1] Md.	PI 343438 (I-214)	0	1	5	5
Populus x *euramericana* (Dode) Guinier cv. Wisconsin #5	5377	Ames, Iowa[5]	---	1	2	5	10
Populus deltoides Bartr.	5318	Maple, Ontario[4]	D-37	0	0	1	20
Populus x *euramericana* (Dode) Guinier cv. I-476	4879	Beltsville,[1] Md.	PI 343439 (I-476)	1	1	10	10
Medium Susceptibility							
Populus cv. Angulata x *P. trichocarpa*	5334	Upper Darby, Pa.[3]	NE-252	1	1	1	20
Populus cv. Angulata x *P.* cv. *Plantierensis*	5264	Upper Darby, Pa.[3]	NE-375	1	1	4	20
Populus cv. Angulata x *P. trichocarpa* Torr. & Gray	5265	Upper Darby, Pa.[3]	NE-379	1	1	4	20
Populus cv. Candicans x *P.* cv. Berolinensis	5263	Upper Darby, Pa.[3]	NE-386	1	1	3	25
Populus tristis Fisch. x *P. balsamifera* L. cv. Tristis #1	5260	Indian Head,[2] Sask.	---	1	5	10	15
Populus deltoides Bartr.	5319	Maple, Ontario[4]	D-45	1	1	4	25
Populus x *euramericans* (Dode) Guinier	5321	Maple, Ontario[4]	DN-31	1	1	10	20
cv. Nigrito de Granada	5321	Maple, Ontario[4]	DN-31	1	1	10	20
Populus x *euramericana* (Dode) Guinier	5323	Maple, Ontario[4]	DN-30	1	1	15	20
Populus x *euramericana* (Dode) Guinier cv. eugenii	5326	Maple, Ontario[4]	DN-34	0	1	10	25
Populus cv. Angulata x *P. trichocarpa* Torr. & Gray	5266	Upper Darby, Pa.[3]	NE-372	0	1	10	25
Populus deltoides Bartr. x *P.* cv. Caudina	5267	Upper Darby, Pa.[3]	NE-366	1	10	10	20
High Susceptibility							
Populus x *euramericana* (Dode) Guinier cv. B-56	5324	Maple, Ontario[4]	DN-26	1	2	20	20
Populus spp.	5258	Indian Head, Sask.[2]	---	1	2	20	25
Populus x *euramericana* (Dode) Guinier cv. I-78-B	5322	Maple, Ontario[4]	I-78-B	1	2	20	25
Populus deltoides Bartr. x *P. trichocarpa* Torr. & Gray	5268	Upper Darby, Pa.[3]	NE-216	1	1	4	50
Populus deltoides Bartr. x *P. balsamifera* L.	5320	Maple, Ontario[4]	Vac-6	1	20	20	20
Populus x *euramericana* (Dode) Guinier cv. Ostia	5325	Maple, Ontario[4]	DN-28	1	2	20	50
Populus x *euramericana* (Dode) Guinier cv. I-45/51	5328	Maple, Ontario[4]	I-45/51	1	1	20	75
Populus deltoides Bartr. x *P. trichocarpa* Torr. & Gray	5335	Upper Darby, Pa.[3]	NE-348	1	10	20	75
Populus spp.	5351	Indian Head, Sask.[2]	---	1	20	20	100
Populus deltoides Bartr.	5273	Indian Head, Sask.[2]	44-52	2	50	100	100
Populus deltoides Bartr. x *P. balsamifera* L. *Populus* 'Northwest'	5261	Indian Head, Sask.[2]	---	20	100	100	100[6]

[1]USDA Plant Introduction Station, Beltsville, Md.
[2]Wm. Cram, P.F.R.A., Tree Nursery, Canada Dept. of Agriculture, Indian Head, Saskatchewan.
[3]Northeastern Forest Experiment Station, Upper Darby, Pa.
[4]Research Branch, Ontario Div. of Lands and Forests, Maple, Ont
[5]Forestry Department, Iowa State University, Ames, Iowa.
[6]Defoliated.

TABLE 1.—*Determining numerical rating of rust infestation*

Estimate of leaf infection		Estimate of infected leaves on tree	Estimate of infected leaves on tree	
Descriptive rating	Numerical rating	Percent	Numerical rating	Numerical rating
Light	1	Less than 25	1	1
		25 to 50	2	2
		50 to 75	3	3
		More than 75	4	4
		Less than 25	1	5
Medium	5	25 to 50	2	10
		50 to 75	3	15
		More than 75	4	20
		Less than 25	1	25
Heavy	25	25 to 50	2	50
		50 to 75	3	75
		More than 75	4	100

Discussion

Schreiner reported that clones with a rust rating of 10 or higher at midseason for 4 years or 25 or higher at the end of the growing season for 2 years should not be recommended for plantings in the vicinity of the test area. one of the clones in this collection showed susceptibility to rest at midseason, except number 5261, *Populus* 'Northwest.' Otherwise, the earliest that variation in rust susceptibility could lee scored was about the middle of August. The relatively high resistance of all of the clones is not surprising inasmuch as they were obtained from *Populus* breeders who had selected them for a number of positive traits, including rust resistance, at their respective locations.

In most of the clones, growth had greatly slowed by the third rating date, and in all eases had essentially stopped by the fourth rating date due to phenological or other factors not related to the rust. Therefore, it seems the degree of infection on the first three rating dates is more significant as a selection criterion than the degree of infection on the fourth. However, 13 clones were rust-rated above 25 at the end of the season, indicating the need for further, more precise testing before clonal material is planted extensively in the area. Only one clone, Populus 'Northwest,' rated above 10 on the first rating date.

The comparative ratings indicate greater variation within species or taxonomic groups than between them. For example, Populus deltoids clone number 5318 was almost completely free of rust until the last rating date. Conversely. P. deltoides clone number 5273 was severely infected by the second rating date. Similarly. P. euramericana clones showed great variability in rest susceptibility. However, both clones possessing P. alba heritage, numbers 4877 and 5334, were virtually rust free.

Degree of rust infestation way not always related to growth rate. For example, clone number 5351 is obviously one of the fastest growing clones in the group in terms of both diameter and height growth. However, it is relatively susceptible to rust.

If these clones are to be grown in other areas, rust susceptibility should he conducted near the planting site. Also, rust evaluations on the most resistant and otherwise most desirable clones should be carried on for several seasons before widespread planting is attempted.

News & Reviews

(Continued from p. 13)

Not long after the U.S. entered the war, the Prairie States Forestry Project was ended. General responsibility for the trees was passed from the U.S. Forest Service to the 1.5. Soil Conservation Service, and farmers no longer received major federal help to plant trees.

Mann younger people in the shelter belt area now do not know why and when the trees were planted. Memories oft he drought and dust have faded.

There is less feeling; on the plains these days that trees are needed to stop wind erosion. Farmers now are much more liken to use stubble mulching,. strip cropping, crop residue management and other methods to help keep the soil in place.

Forestry experts now say that the 10to 15-row-windbreaks were unnecessarily wide; windbreak plantings of one to three rows have been found effective and take much less land.

John Muehlbeier lived through the period 40 year· ago on the plains when the sun was blackened by clouds of dust and grasshoppers and when the duststorms became too heavy for auto traffic, even in midday.

"Times were bad; we couldn't wait to know everything about what to do to stop these dust storms," Muehlbeier said, "and there's nothing like the shelter belt project that's ever been done in this country – 1,000 miles north to south. That's something." (from a report in The Washington Post. Oct. 21, 1973)

In search of the American Chestnut

Do you know of a mature, healthy American chestnut tree? If you do, you can help the Soil Conservation Service in its search for a blight-resistant chestnut. Let your local conservation district or the nearest SCS office know about the trees, or write to the woodland conservationist at the SCS state office.

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