Ability to root is doubtless a segregating genetic character to be carefully watched and tested in breeding work. Good as a selection from a species or a hybrid clone may be with respect to its size or color of bloom, its shapely habit or its highly-colored and mildew-resistant fall foliage, the same selection is still virtually worthless if it cannot be vegetatively propagated with relative ease. It is unfortunate that this point has been overlooked by so many amateurs and professionals who have selected and named new plants, including deciduous azaleas.

MODERATOR MARCH: The next subject deals with the germination of Koelreuteria seed. It is by Mr. Robert L. Gonderman and Dr. Steve O'Rourke. The paper will be presented by Dr. O'Rourke.

FACTORS AFFECTING THE GERMINATION OF KOELREUTERIA SEED 1/

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The Golden-rain tree (Koelreuteria paniculata Laxm) is a desirable small-sized neat landscape tree of unique merit for its lacy pyramids of yellow blooms in mid-summer and its persistent fruit capsules during the fall and winter. Apparently, there are few selected clones of this species and propagation by vegetative means is seldom practiced. Bailey (1), Creech (2), Fuller (4) and Hartmann and Kester (5) note that root cuttings may be used successfully and both Bailey (1) and Fuller (4) indicate that layering is also employed.

Propagation by seed is the usual method as the species is generally homogeneous and there is little variation among seedling trees. Fordham (3) states that a soak of 1 hour in concentrated sulfuric acid and immediate sowing of the seed resulted in germination within 13 days. The U. S. Forest Service (6) reports that 1 hour in sulfuric acid followed by stratification at 41° F for 90 days gave the best germination.

Methods and Materials

In order to determine the effects of pregermination treatments, seed was gathered from trees on the M. S. U. campus in early October, 1960, and divided into eight lots, seven of which were treated with chemicals as shown in Table 1 and the other left untreated for comparison. All the chemicals were used in a full strength concentration. After the chemical treatments, one-half of each lot was soaked in 10 ppm of gibberellic acid and the other half in distilled water for 48 hours. Finally, each lot of seed was halved again, one portion being placed in moist 41° F cold storage for 30 days and the other for 78 days. After these periods of stratification, the lots of 15 seed each were planted in flats of shredded sphagnum moss in a 70° F greenhouse. Germination records were taken at weekly intervals. Opening and spread of the cotyledons was used as an indication of germination.

Results

The differences due to soaking with gibberellic acid after the chemical treatment were too slight and variable to be considered of any consequence. The period of stratification was definitely important, as may be noted in Table 1. Seed stratified for 78 days germinated earlier and gave a higher percent of total germination at the 20 week close of the experiment.

Early germination, especially during the second and third week, was most marked with sulfuric acid treated seed. At the tenth week, the three superior treatments were sulfuric acid, diethyl ether and acetone. At the 20-week close of the experiment, the total percent of germination was highest with sulfuric acid treated seed, followed in descending order by those treated with diethyl ether, acetone and carbon tetrachloride. Those treated with xylene and petroleum ether were lower than the untreated control in percent of germination.

Summary

Treatment of Koelreuteria seed with seven different chemicals and two periods of after-ripening indicated that scarification with concentrated sulfuric acid for 30 minutes followed by 78 days of stratification at 41° F was an effective method to induce early Koelreuteria is apparently due both to the impermeability of the seed coat and to a condition of internal dormancy.

Note 1/ Journal Article No. 2896 of the Michigan Agricultural Experiment Station.

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TABLE I

PERCENT GERMINATION OF KOELREUTERIA PANICULATA SEED
AS AFFECTED BY CHEMICAL TREATMENT AND PERIOD OF STRATIFICATION

Chemical Treatment	Minutes of Exposure	Days Stratified	After 3 Weeks	After 10 Weeks	After 20 Weeks
	0	30	0	7	40
Control		78	0	17	43
		30	0	3	70
Sulfuric acid	5	78	90	90	90
		30	10	10	60
	30	78	97	97	97
		30	0	50	63
	5	78	0	47	60
Diethyl ether		30	0	3	57
	30	78	47	50	50
		30	3	0	47
	5	78	40	43	47
Acetone		30	3	7	37
	30	78	40	50	57
		30	0	7	50
	5	78	0	17	17
Toluene		30	0	0	73
	30	78	0	3	10
		30	0	7	30
	5	78	0	3	10
Petroleum ether		30	0	7	37
	30	78	3	7	17
		30	0	3	43
	5	78	0	0	0
Xylene		30	0	0	27
	30	78	0	0	7
		30	0	0	53
	5	78	0	0	10
Carbon		30	0	3	17
Tetrachloride	30	78	0	20	24