Production and Rooting of Shoots Generated from Dormant Stem Sections of Maple Species

Paul H. Henry and John E. Preece

B4 Asuka Nishii

My favorite tree is…

Acer palmatum subsp.*matsumurae* (ヤマモミジ)

Production and Rooting of Shoots Generated from Dormant Stem Sections of Maple Species

Paul H. Henry and John E. Preece

B4 Asuka Nishii

Background…

A number of important ornamental tree species can be propagated vegetatively by stem cuttings..

Acer, may only be rooted in commercially acceptable percentages if cuttings are collected while they are in actively growing condition.

- ability to force and root shoots during the winter would prolong the availability of rooted cuttings and increase the flexibility associated with propagation tasks.

- →it has been shown with several species that stem sections removed from mature&dormant trees can be forced to produce shoots and that these shoots can be rooted (Ikemori 1987).
- In the case of Oak, the number of shoots generated and the rooting were variable depending on clone(Harmer 1988)

In the case of Acer…???

Objective

Collect branches from mature&dormant maple

- to investigate if Acer species could be propagated using this method

&

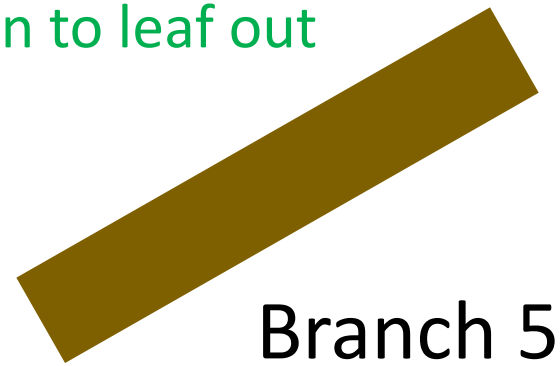
- to quantify both species and clonal differences that might exist within the genus.

Materials

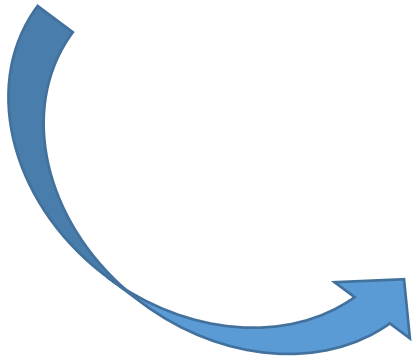
- Japanese maple(*Acer palmatum* Thunb.)
- Red maple(*Acer rubrum* L.)
- Sugar maple(*Acer saccharum* Marsh.)

Methods - shoot generation -

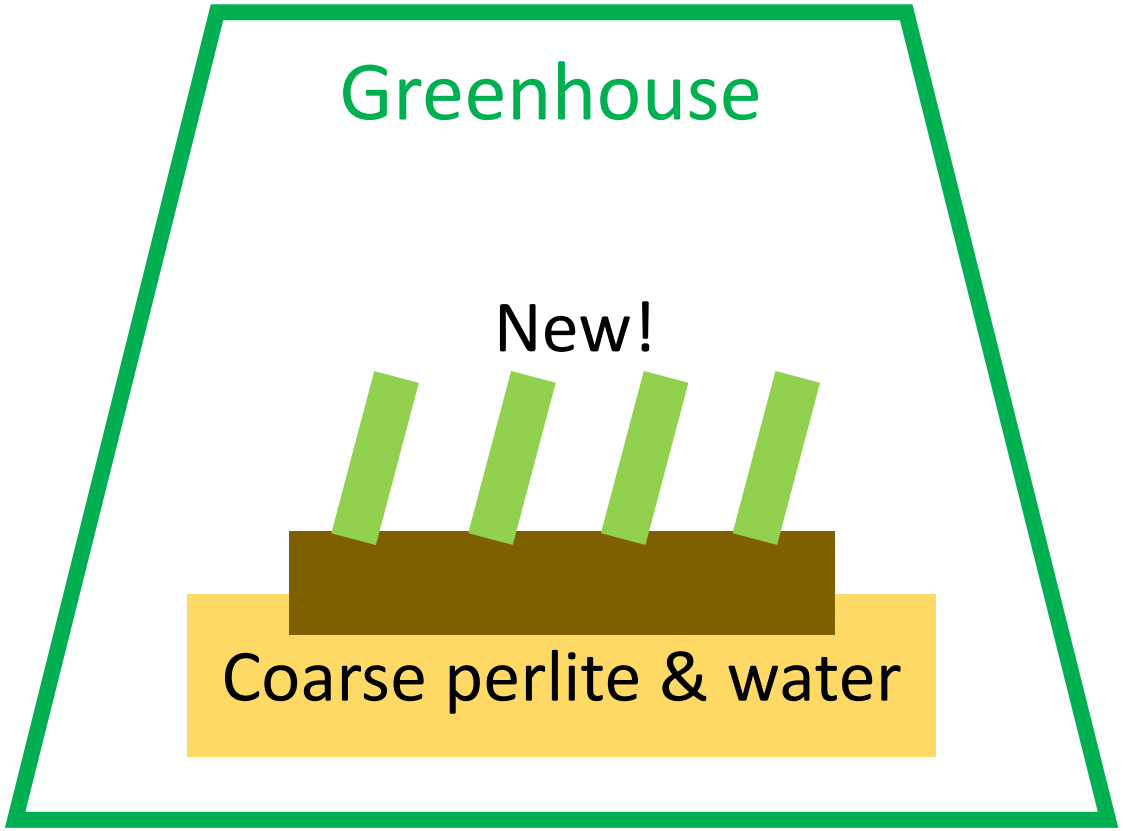
Before the trees had begun to leaf out



Branch 50cm

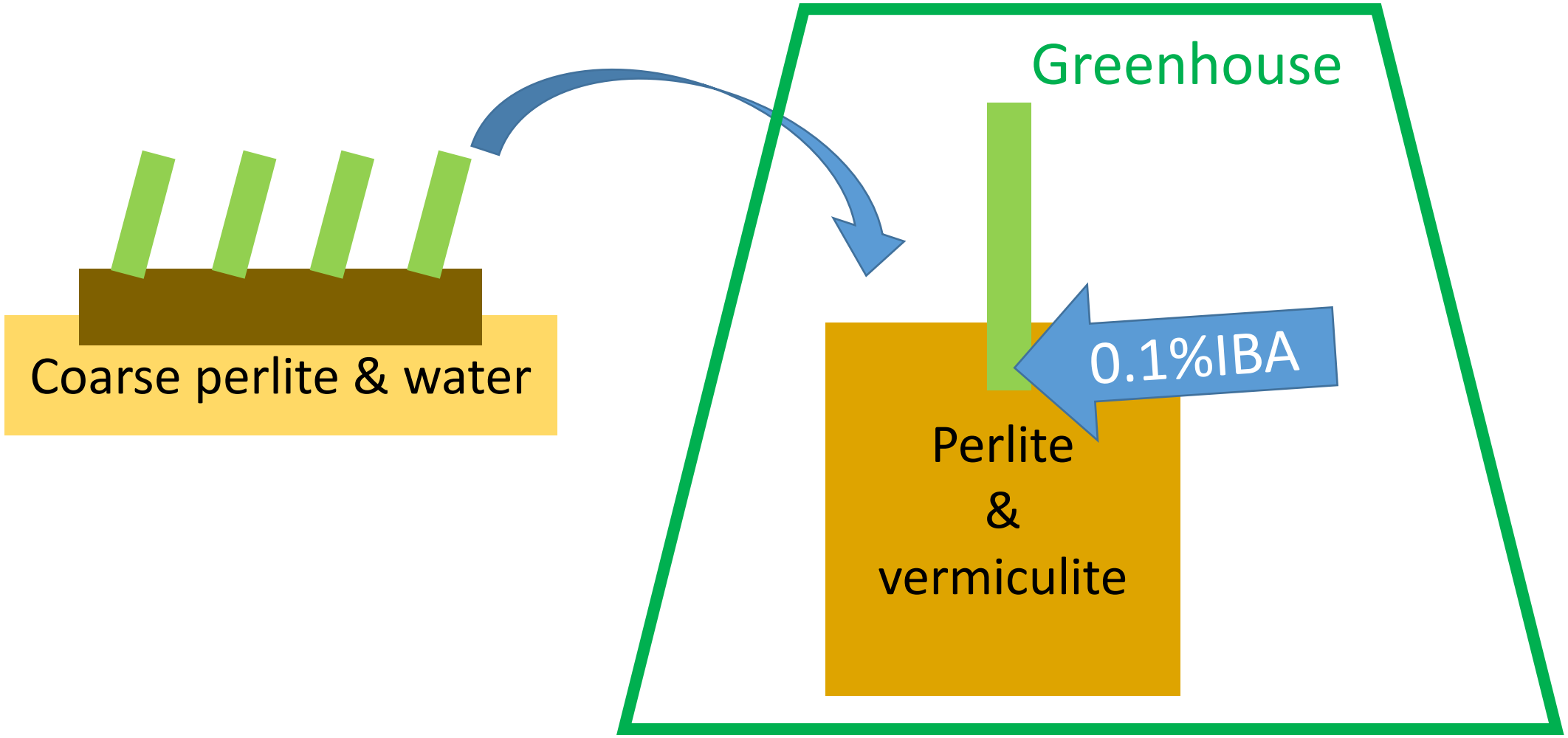


Plastic bag
4℃ 4day



Collected from 3 different clones(trees) of each species

Methods - rooting of shoots -



IBA : indole-3-butyric acid

Results

The number of stem sections forming shoots

20 ~80%

Highly variable for clones

50~70%

No significant difference

0~40%

species	clone	N	stem forming shoots	mean no. shoots ave. /stem section
japanese	all	30	16	3.6
red	all	30	18	6.5
sugar	all	30	6	1.2
japanese	1	10	8	3.6
	2	10	2	2
	3	10	6	4.2
	significance			NS
	t test 5%			
	t test 1%			
red	1	10	5	2
	2	10	7	9.9
	3	10	6	6.3
	significance			*
	t test 5%			3
	t test 1%			4.3
sugar	1	10	0	0
	2	10	4	1.3
	3	10	2	1
	significance			NS
	t test 5%			

Results

The number of new shoot per a stem sections (average)

species	clone	N	stem forming shoots	mean no. shoots ave. /stem section
japanese	all	30	16	3.6
red	all	30	18	6.5
sugar	all	30	6	1.2
japanese	1	10	8	3.6
	2	10	2	2
	3	10	6	4.2
	significance			NS
	t test 5%			
	t test 1%			
red	1	10	5	2
	2	10	7	9.9
	3	10	6	6.3
	significance			*
	t test 5%			3
	t test 1%			4.3
sugar	1	10	0	0
	2	10	4	1.3
	3	10	2	1
	significance			NS
	t test 5%			

Nonsignificant for clone

Significant at P≤0.05

Results

Percentages of rooting

		mean no. roots		
species	clone	N	shoots forming roots	ave./shoots
japanese	all	103	27	3.2
red	all	212	125	5.7
sugar	all	13	2	2.5
japanese	1	47	9	2.4
	2	13	3	2
	3	43	15	3.9
	significance			*
	t test 5%			1.4
	t test 1%			
red	1	15	8	3.8
	2	139	82	5.5
	3	58	35	6.8
	significance			**
	t test 5%			1.5
	t test 1%			2
sugar	1	0	0	0
	2	8	0	0
	3	5	2	2.5
	significance			NS
	t test 5%			

Japanese : 26%
Red : 59%
Sugar : 15%

Significant
For clones

Discussion

- softwood shoots of maple species can be forced from dormant stem sections and that these shoots may be rooted.
- the percentage of stem sections forming shoots varies between both species and clones.
- Clonal variation in rooting response was generally less than that observed for shoot generation.

- →We should …
- Screen more various clones before using this technique.
- evaluate Higher auxin levels

Prospects for the future

- identify species/clones that have an enhanced ability to form shoots

- improve method to increase the percentage of stem sections forming roots