

Table S1. Effect of preharvest feeding by *Leptoglossus occidentalis* on *Pinus thunbergii* seeds

Tree	Lo treatment						Control							
	No. of cones	No. of seeds		Mean		Sunken seed rate (%)		No. of cones	No. of seeds		Mean		Sunken seed rate (%)	
				weight of seeds (mg)							weight of seeds (mg)			
		Mean \pm	SD	Mean \pm	SD	Mean \pm	SD		Mean \pm	SD	Mean \pm	SD		
A	4	25.5 \pm	10.5	9.9 \pm	1.9	30.1 \pm	6.1	5	33.0 \pm	16.5	11.9 \pm	2.7	47.5 \pm	12.8
B	5	50.0 \pm	12.1	11.1 \pm	1.2	9.0 \pm	4.8	5	51.0 \pm	2.3	12.3 \pm	1.2	20.1 \pm	6.5
C	5	61.6 \pm	14.5	12.9 \pm	2.5	15.3 \pm	12.1	5	61.2 \pm	11.9	15.9 \pm	4.0	33.8 \pm	17.6
D	5	14.0 \pm	8.6	10.8 \pm	0.6	17.3 \pm	6.4	5	17.2 \pm	8.9	13.1 \pm	2.2	37.3 \pm	15.2
E	5	44.2 \pm	25.4	15.8 \pm	1.5	30.8 \pm	18.4	5	43.8 \pm	21.6	17.1 \pm	3.6	49.6 \pm	29.3
F	5	20.4 \pm	10.6	9.1 \pm	3.2	12.5 \pm	18.1	5	20.2 \pm	9.8	11.4 \pm	6.4	25.3 \pm	31.6
Total	29	36.3 \pm	22.2	11.7 \pm	2.9	18.8 \pm	14.1	30	37.7 \pm	20.2	13.6 \pm	4.0	35.6 \pm	21.9

Lo treatment: Five *L. occidentalis* were enclosed in a nonwoven fabric bag with a *P. thunbergii* cone.

Table S2. Effect of postharvest feeding by *Leptoglossus occidentalis* on *Pinus thunbergii* seeds

Tree	Lo treatment						Control							
	No. of cones	No. of seeds		Mean weight of seeds (mg)		Sunken seed rate (%)		No. of cones	No. of seeds		Mean weight of seeds (mg)		Sunken seed rate (%)	
		Mean	± SD	Mean	± SD	Mean	± SD		Mean	± SD	Mean	± SD	Mean	± SD
G	19	25.2	± 21.5	15.6	± 3.2	26.1	± 17.8	19	29.1	± 20.7	17.2	± 4.5	45.7	± 28.2
H	20	30.2	± 18.0	11.0	± 2.2	8.0	± 9.1	20	30.9	± 12.4	12.7	± 1.9	19.4	± 12.7
I	19	25.9	± 12.6	11.1	± 1.6	19.6	± 11.6	20	28.8	± 16.5	11.4	± 2.3	26.7	± 16.3
J	20	36.7	± 17.4	18.4	± 3.9	54.2	± 21.4	20	39.9	± 15.8	18.8	± 4.2	60.6	± 26.3
K	20	27.0	± 17.9	13.7	± 3.9	20.4	± 15.1	20	25.7	± 14.1	13.8	± 2.9	30.2	± 17.0
Total	98	29.1	± 17.9	14.0	± 4.2	25.7	± 21.9	99	30.9	± 16.5	14.8	± 4.3	36.4	± 25.3

Lo treatment: Twenty *L. occidentalis* were enclosed in a plastic case with ~20 *P. thunbergii* cones.

Table S3. Features of sunken and floating seeds of *Pinus thunbergii* damaged by *Leptoglossus occidentalis*

Feeding treatment	Tree	Sinkers						Floaters					
		No. of Seeds	Weight (mg)		X-ray		Germination rate (%)	No. of Seeds	Weight (mg)		X-ray		Germination rate (%)
			Mean	± SD	F	NF			Mean	± SD	F	NF	
Lo	A	5	20.5 ± 0.6		5	0	100	10	7.7 ± 2.5		0	10	0
	B	3	22.6 ± 2.1		3	0	100	24	10.6 ± 2.4		0	24	0
	C	5	22.9 ± 2.2		5	0	100	24	10.8 ± 3.1		0	24	0
	D	2	24.7 ± 1.2		2	0	100	24	9.3 ± 2.6		0	24	0
	E	13	25.2 ± 2.0		13	0	100	24	12.8 ± 3.0		0	24	0
Total (Lo)		28	23.0 ± 2.4		28	0	100	106	10.4 ± 2.7		0	106	0
Control	A	6	19.4 ± 2.1		6	0	100	3	8.2 ± 1.9		0	3	0
	B	11	21.4 ± 1.4		11	0	100	24	10.5 ± 2.5		0	24	0
	C	19	24.9 ± 1.6		19	0	95	24	10.9 ± 2.4		0	24	0
	D	6	21.0 ± 1.3		6	0	83	18	9.0 ± 2.8		0	18	0
	E	24	22.4 ± 1.8		24	0	100	24	11.2 ± 2.9		0	24	0
Total (Control)		66	23.6 ± 2.5		66	0	96	93	10.5 ± 3.1		0	93	0
Total		94	22.9 ± 2.5		94	0	98	199	10.5 ± 2.9		0	199	0

Number of filled seeds (F) and number of nonfilled seeds (NF) classified based on X-ray photos.