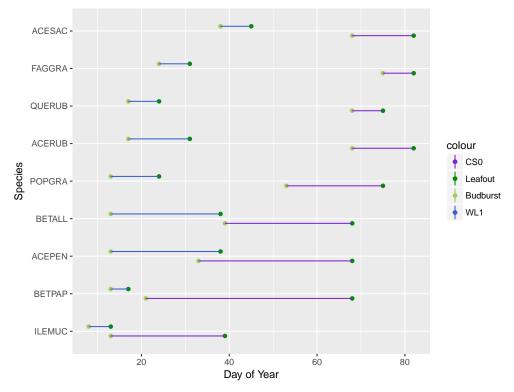
Chilling Experiment Figures

Figure 1: Day of budburst and the day of leaf out for native tree species in New England. Data was collected from a growth chamber experiment using any combination of two photoperiod treatments, two forcing treatments, and three chilling treatments. The standard deviation is represented in blue for budburst and green for leaf out.



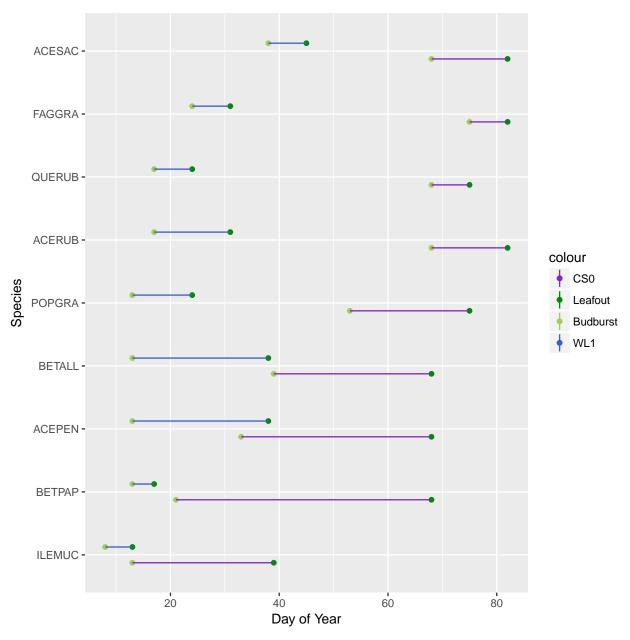


Figure 2: A scatterplot indicating FSI values from 2008 to 2014 for each methology used in this study. PhenoCam FSI values are red, Observed FSI values are blue, and USA-NPN FSI values are green.

ACEPEN	Sum.Sq	Df	F value	$\Pr(>F)$
chilling	149.41	2	1.20	0.30
forcing	4909.59	1	78.94	0.00
photoperiod	1309.59	1	21.06	0.00
Residuals	6654.56	107		
ACERUB	Sum.Sq	Df	F value	$\Pr(>F)$
chilling	0.62	2	0.00	1.00
forcing	1731.00	1	25.92	0.00
photoperiod	462.78	1	6.93	0.01
Residuals	6611.17	99		
ACESAC	Sum.Sq	Df	F value	Pr(>F)
chilling	65.41	2	0.46	0.64
forcing	259.14	1	3.61	0.06
photoperiod	231.41	1	3.22	0.08
Residuals	4524.88	63		
BETALL	Sum.Sq	Df	F value	Pr(>F)
chilling	525.95	2	5.00	0.01
forcing	1463.30	1	27.81	0.00
photoperiod	632.83	1	12.03	0.00
Residuals	6944.50	132		
BETPAP	$\operatorname{Sum.Sq}$	Df	F value	$\Pr(>F)$
chilling	6.00	2	0.04	0.96
forcing	1776.23	1	21.47	0.00
photoperiod	1105.08	1	13.35	0.00
Residuals	10509.00	127		
FAGGRA	Sum.Sq	Df	F value	Pr(>F)
chilling	144.41	2	1.66	0.20
forcing	611.20	1	14.04	0.00
photoperiod	1.05	1	0.02	0.88
Residuals	2829.78	65		

	ILEMUC	Su	m.Sq	Df	F	value	Pr(>F)	
	chilling	:	26.49	2		0.54	0.59	
	forcing	220	62.34	1		91.61	0.00	
	photoperiod	103	35.85	1		41.94	0.00	
	Residuals	333	34.05	135				
	POPGRA		ım.Sq	Df	F	value	Pr(>F)	
	chilling		54.63	2		0.39	0.68	
	forcing	24	05.73	1		34.52	0.00	
	photoperiod	10	19.78	1		14.63	0.00	
	Residuals	67	60.98	97				
	QUERUB	Su	m.Sq	Df	F	value	Pr(>F)	
	chilling	;	35.61	2		0.45	0.64	
	forcing	68	80.83	1		17.34	0.00	
	photoperiod	30	69.53	1		9.41	0.00	
	Residuals	49	46.29	126				
	ACEPE		Sum.	.Sq	Df	F val	ue Pr(>	F)
	chilli	_	104		2	0.	87 0.	42
	forci	ng	4745	.38	1	79.	18 0.	00
	photoperi	od	1306	.03	1	21.	79 0.	00
	chilling:forci	ng	63	.31	2	0.	53 0.	59
ch	illing:photoperi	od	181	.96	2	1.	52 0.	22
fo	rcing:photoperi	od	257	.63	1	4.	30 0.	04
	Residua	als	6113	.18	102			
	ACERI	IJB	Sum	Sa	Df	F valı	ie Pr(>l	F)
	chilli			53	2	0.0		
	forc	_	1721		1	26.1		
	photoperi	_	381		1	5.8		
	chilling:forc		358		2	2.7		
ch	nilling:photoperi			7.69	2	0.2		
	0				1	0.6		
10	orcing:photoperi	iod	17	'.35	1	0.2	26 0.6	10

ACESAC Sum.Sq Df F value Pr(>F) chilling 65.78 2 0.45 0.64 forcing 204.31 1 2.83 0.10 photoperiod 267.24 1 3.70 0.06 chilling:photoperiod 164.28 2 1.14 0.33 forcing:photoperiod 0.05 1 0.00 0.98 Residuals 4194.28 58 F value Pr(>F) BETALL Sum.Sq Df F value Pr(>F) chilling 526.41 2 5.57 0.00 photoperiod 632.83 1 13.38 0.00 photoperiod 632.83 1 13.38 0.00 chilling:forcing 66.32 2 0.70 0.50 chilling:photoperiod 612.56 1 12.95 0.00 Residuals 6005.50 127 12.95 0.00 photoperiod 1101.18 1 13.24 0.00 <th></th> <th></th> <th></th> <th></th> <th></th>					
forcing photoperiod photoperiod photoperiod chilling:forcing remains in this photoperiod chilling:photoperiod recing:photoperiod residuals res	ACESAC	Sum.Sq	Df	F value	$\Pr(>F)$
photoperiod chilling:forcing 267.24 1 3.70 0.06 chilling:photoperiod chilling:photoperiod forcing:photoperiod 164.28 2 1.14 0.33 forcing:photoperiod Residuals 4194.28 58 1 0.00 0.98 BETALL Chilling Sec.41 2 5.57 0.00	chilling	65.78	2	0.45	0.64
chilling:forcing 76.27 2 0.53 0.59 chilling:photoperiod 164.28 2 1.14 0.33 forcing:photoperiod 0.05 1 0.00 0.98 Residuals 4194.28 58	forcing	204.31	1	2.83	0.10
chilling:photoperiod 164.28 2 1.14 0.33 forcing:photoperiod 0.05 1 0.00 0.98 Residuals 4194.28 58	photoperiod	267.24	1	3.70	0.06
forcing:photoperiod 0.05 1 0.00 0.98 Residuals 4194.28 58	chilling:forcing	76.27	2	0.53	0.59
Residuals 4194.28 58 F value Pr(>F)	chilling:photoperiod	164.28	2	1.14	0.33
BETALL Sum.Sq Df F value Pr(>F) chilling 526.41 2 5.57 0.00 forcing 1463.33 1 30.95 0.00 photoperiod 632.83 1 13.38 0.00 chilling:forcing 66.32 2 0.70 0.50 chilling:photoperiod 612.56 1 12.95 0.00 Residuals 6005.50 127 12.95 0.00 Residuals 6005.50 127 12.95 0.00 Residuals 6005.50 127 12.95 0.00 chilling 6.07 2 0.04 0.96 forcing 1765.57 1 21.22 0.00 photoperiod 1101.18 1 13.24 0.00 chilling:photoperiod 62.92 2 0.38 0.69 forcing:photoperiod 233.62 1 2.81 0.10 Residuals 10148.80 122 1.64 0.20	forcing:photoperiod	0.05	1	0.00	0.98
chilling 526.41 2 5.57 0.00 forcing 1463.33 1 30.95 0.00 photoperiod 632.83 1 13.38 0.00 chilling:forcing 66.32 2 0.70 0.50 chilling:photoperiod 226.18 2 2.39 0.10 forcing:photoperiod 612.56 1 12.95 0.00 Residuals 6005.50 127 127 12.95 0.00 Residuals 6005.50 127 127 12.95 0.00 BETPAP Sum.Sq Df F value Pr(>F) chilling 6.07 2 0.04 0.96 forcing 1765.57 1 21.22 0.00 photoperiod 1101.18 1 13.24 0.00 chilling:forcing 71.38 2 0.43 0.69 forcing:photoperiod 233.62 1 2.81 0.10 Residuals 10148.80 122	Residuals	4194.28	58		
chilling 526.41 2 5.57 0.00 forcing 1463.33 1 30.95 0.00 photoperiod 632.83 1 13.38 0.00 chilling:forcing 66.32 2 0.70 0.50 chilling:photoperiod 226.18 2 2.39 0.10 forcing:photoperiod 612.56 1 12.95 0.00 Residuals 6005.50 127 127 12.95 0.00 Residuals 6005.50 127 127 12.95 0.00 BETPAP Sum.Sq Df F value Pr(>F) chilling 6.07 2 0.04 0.96 forcing 1765.57 1 21.22 0.00 photoperiod 1101.18 1 13.24 0.00 chilling:forcing 71.38 2 0.43 0.69 forcing:photoperiod 233.62 1 2.81 0.10 Residuals 10148.80 122					
forcing 1463.33 1 30.95 0.00 photoperiod 632.83 1 13.38 0.00 chilling:forcing 66.32 2 0.70 0.50 chilling:photoperiod 226.18 2 2.39 0.10 forcing:photoperiod 612.56 1 12.95 0.00 Residuals 6005.50 127 BETPAP	BETALL	Sum.Sq	Df	F value	Pr(>F)
photoperiod 632.83 1 13.38 0.00 chilling:forcing 66.32 2 0.70 0.50 chilling:photoperiod 226.18 2 2.39 0.10 forcing:photoperiod 612.56 1 12.95 0.00 Residuals 6005.50 127 BETPAP	chilling	526.41	2	5.57	0.00
chilling:forcing 66.32 2 0.70 0.50 chilling:photoperiod 226.18 2 2.39 0.10 forcing:photoperiod 612.56 1 12.95 0.00 Residuals 6005.50 127 BETPAP Sum.Sq Df F value Pr(>F) chilling 6.07 2 0.04 0.96 forcing 1765.57 1 21.22 0.00 photoperiod 1101.18 1 13.24 0.00 chilling:forcing 71.38 2 0.43 0.65 chilling:photoperiod 233.62 1 2.81 0.10 Residuals 10148.80 122 12 FAGGRA Sum.Sq Df F value Pr(>F) chilling 145.37 2 1.64 0.20 forcing 595.26 1 13.40 0.00 photoperiod 0.42 1 0.01	forcing	1463.33	1	30.95	0.00
chilling:photoperiod 226.18 2 2.39 0.10 forcing:photoperiod 612.56 1 12.95 0.00 Residuals 6005.50 127 127 12.95 0.00 BETPAP Sum.Sq Df F value Pr(>F) chilling 6.07 2 0.04 0.96 forcing 1765.57 1 21.22 0.00 photoperiod 1101.18 1 13.24 0.00 chilling:forcing 71.38 2 0.43 0.65 chilling:photoperiod 62.92 2 0.38 0.69 forcing:photoperiod 233.62 1 2.81 0.10 Residuals 10148.80 122 12.81 0.10 Residuals 10148.80 122 1.64 0.20 forcing:photoperiod 0.42 1 13.40 0.00 photoperiod 0.42 1 0.01 0.92 chilling:photoperiod 83.56 2 <td>photoperiod</td> <td>632.83</td> <td>1</td> <td>13.38</td> <td>0.00</td>	photoperiod	632.83	1	13.38	0.00
forcing:photoperiod 612.56 1 12.95 0.00 Residuals 6005.50 127 BETPAP Sum.Sq Df F value Pr(>F) chilling 6.07 2 0.04 0.96 forcing 1765.57 1 21.22 0.00 photoperiod 1101.18 1 13.24 0.00 chilling:forcing 71.38 2 0.43 0.65 chilling:photoperiod 62.92 2 0.38 0.69 forcing:photoperiod 233.62 1 2.81 0.10 Residuals 10148.80 122 FAGGRA Sum.Sq Df F value Pr(>F) chilling 145.37 2 1.64 0.20 forcing 595.26 1 13.40 0.00 photoperiod 0.42 1 0.01 0.92 chilling:forcing 39.45 2 0.44 0.64 chilling:photoperiod 83.56 2 0.94 0.40 forcing:photoperiod 35.33 1 0.80 0.38	chilling:forcing	66.32	2	0.70	0.50
Residuals 6005.50 127 BETPAP Sum.Sq Df F value Pr(>F) chilling 6.07 2 0.04 0.96 forcing 1765.57 1 21.22 0.00 photoperiod 1101.18 1 13.24 0.00 chilling:forcing 71.38 2 0.43 0.65 chilling:photoperiod 62.92 2 0.38 0.69 forcing:photoperiod 233.62 1 2.81 0.10 Residuals 10148.80 122 12.81 0.10 FAGGRA Sum.Sq Df F value Pr(>F) chilling 145.37 2 1.64 0.20 photoperiod 0.42 1 0.01 0.92 chilling:forcing 39.45 2 0.44 0.64 chilling:photoperiod 83.56 2 0.94 0.40 forcing:photoperiod 35.33 1 0.80 0.38	chilling:photoperiod	226.18	2	2.39	0.10
$\begin{array}{c ccccccccccccccccccccccccccccccccccc$	forcing:photoperiod	612.56	1	12.95	0.00
chilling 6.07 2 0.04 0.96 forcing 1765.57 1 21.22 0.00 photoperiod 1101.18 1 13.24 0.00 chilling:forcing 71.38 2 0.43 0.65 chilling:photoperiod 62.92 2 0.38 0.69 forcing:photoperiod 233.62 1 2.81 0.10 Residuals 10148.80 122 FAGGRA Sum.Sq Df F value Pr(>F) chilling 145.37 2 1.64 0.20 forcing 595.26 1 13.40 0.00 photoperiod 0.42 1 0.01 0.92 chilling:forcing 39.45 2 0.44 0.64 chilling:photoperiod 83.56 2 0.94 0.40 forcing:photoperiod 35.33 1 0.80 0.38	Residuals	6005.50	127		
chilling 6.07 2 0.04 0.96 forcing 1765.57 1 21.22 0.00 photoperiod 1101.18 1 13.24 0.00 chilling:forcing 71.38 2 0.43 0.65 chilling:photoperiod 62.92 2 0.38 0.69 forcing:photoperiod 233.62 1 2.81 0.10 Residuals 10148.80 122 FAGGRA Sum.Sq Df F value Pr(>F) chilling 145.37 2 1.64 0.20 forcing 595.26 1 13.40 0.00 photoperiod 0.42 1 0.01 0.92 chilling:forcing 39.45 2 0.44 0.64 chilling:photoperiod 83.56 2 0.94 0.40 forcing:photoperiod 35.33 1 0.80 0.38					
forcing 1765.57 1 21.22 0.00 photoperiod 1101.18 1 13.24 0.00 chilling:forcing 71.38 2 0.43 0.65 chilling:photoperiod 62.92 2 0.38 0.69 forcing:photoperiod 233.62 1 2.81 0.10 Residuals 10148.80 122 FAGGRA Sum.Sq Df F value Pr(>F) chilling 145.37 2 1.64 0.20 forcing 595.26 1 13.40 0.00 photoperiod 0.42 1 0.01 0.92 chilling:forcing 39.45 2 0.44 0.64 chilling:photoperiod 83.56 2 0.94 0.40 forcing:photoperiod 35.33 1 0.80 0.38	BETPAP	Sum.Sq	Df	F value	Pr(>F)
photoperiod 1101.18 1 13.24 0.00 chilling:forcing 71.38 2 0.43 0.65 chilling:photoperiod 62.92 2 0.38 0.69 forcing:photoperiod 233.62 1 2.81 0.10 Residuals 10148.80 122 122 FAGGRA Sum.Sq Df F value Pr(>F) chilling 145.37 2 1.64 0.20 forcing 595.26 1 13.40 0.00 photoperiod 0.42 1 0.01 0.92 chilling:forcing 39.45 2 0.44 0.64 chilling:photoperiod 83.56 2 0.94 0.40 forcing:photoperiod 35.33 1 0.80 0.38	chilling	6.07	2	0.04	0.96
chilling:forcing 71.38 2 0.43 0.65 chilling:photoperiod 62.92 2 0.38 0.69 forcing:photoperiod 233.62 1 2.81 0.10 Residuals 10148.80 122 122 FAGGRA Sum.Sq Df F value Pr(>F) chilling 145.37 2 1.64 0.20 forcing 595.26 1 13.40 0.00 photoperiod 0.42 1 0.01 0.92 chilling:forcing 39.45 2 0.44 0.64 chilling:photoperiod 83.56 2 0.94 0.40 forcing:photoperiod 35.33 1 0.80 0.38	forcing	1765.57	1	21.22	0.00
chilling:photoperiod 62.92 2 0.38 0.69 forcing:photoperiod 233.62 1 2.81 0.10 Residuals 10148.80 122 122 FAGGRA Sum.Sq Df F value Pr(>F) chilling 145.37 2 1.64 0.20 forcing 595.26 1 13.40 0.00 photoperiod 0.42 1 0.01 0.92 chilling:forcing 39.45 2 0.44 0.64 chilling:photoperiod 83.56 2 0.94 0.40 forcing:photoperiod 35.33 1 0.80 0.38	photoperiod	1101.18	1	13.24	0.00
forcing:photoperiod 233.62 1 2.81 0.10 Residuals 10148.80 122	chilling:forcing	71.38	2	0.43	0.65
Residuals 10148.80 122 FAGGRA Sum.Sq Df F value Pr(>F) chilling 145.37 2 1.64 0.20 forcing 595.26 1 13.40 0.00 photoperiod 0.42 1 0.01 0.92 chilling:forcing 39.45 2 0.44 0.64 chilling:photoperiod 83.56 2 0.94 0.40 forcing:photoperiod 35.33 1 0.80 0.38	chilling:photoperiod	62.92	2	0.38	0.69
FAGGRA Sum.Sq Df F value Pr(>F) chilling 145.37 2 1.64 0.20 forcing 595.26 1 13.40 0.00 photoperiod 0.42 1 0.01 0.92 chilling:forcing 39.45 2 0.44 0.64 chilling:photoperiod 83.56 2 0.94 0.40 forcing:photoperiod 35.33 1 0.80 0.38	forcing:photoperiod	233.62	1	2.81	0.10
chilling 145.37 2 1.64 0.20 forcing 595.26 1 13.40 0.00 photoperiod 0.42 1 0.01 0.92 chilling:forcing 39.45 2 0.44 0.64 chilling:photoperiod 83.56 2 0.94 0.40 forcing:photoperiod 35.33 1 0.80 0.38	Residuals	10148.80	122		
chilling 145.37 2 1.64 0.20 forcing 595.26 1 13.40 0.00 photoperiod 0.42 1 0.01 0.92 chilling:forcing 39.45 2 0.44 0.64 chilling:photoperiod 83.56 2 0.94 0.40 forcing:photoperiod 35.33 1 0.80 0.38					
forcing 595.26 1 13.40 0.00 photoperiod 0.42 1 0.01 0.92 chilling:forcing 39.45 2 0.44 0.64 chilling:photoperiod 83.56 2 0.94 0.40 forcing:photoperiod 35.33 1 0.80 0.38	FAGGRA	Sum.Sq	Df		Pr(>F)
photoperiod 0.42 1 0.01 0.92 chilling:forcing 39.45 2 0.44 0.64 chilling:photoperiod 83.56 2 0.94 0.40 forcing:photoperiod 35.33 1 0.80 0.38	chilling	145.37	2	1.64	0.20
chilling:forcing 39.45 2 0.44 0.64 chilling:photoperiod 83.56 2 0.94 0.40 forcing:photoperiod 35.33 1 0.80 0.38	forcing	595.26	1	13.40	0.00
chilling:photoperiod 83.56 2 0.94 0.40 forcing:photoperiod 35.33 1 0.80 0.38	photoperiod	0.42	1	0.01	0.92
forcing:photoperiod 35.33 1 0.80 0.38	chilling:forcing	39.45	2	0.44	0.64
	chilling:photoperiod	83.56	2	0.94	0.40
Residuals 2665.38 60	forcing:photoperiod	35.33	1	0.80	0.38
	Residuals	2665.38	60		

ILEMUC	Sum.Sq	Df	F value	Pr(>F)
chilling	28.03	2	0.60	0.55
forcing	2277.73	1	97.37	0.00
photoperiod	1033.49	1	44.18	0.00
chilling:forcing	16.09	2	0.34	0.71
chilling:photoperiod	106.28	2	2.27	0.11
forcing:photoperiod	171.89	1	7.35	0.01
Residuals	3041.00	130		

POPGRA	Sum.Sq	Df	F value	Pr(>F)
chilling	50.56	2	0.37	0.69
forcing	2390.66	1	35.16	0.00
photoperiod	1016.39	1	14.95	0.00
chilling:forcing	45.72	2	0.34	0.72
chilling:photoperiod	152.02	2	1.12	0.33
forcing:photoperiod	296.37	1	4.36	0.04
Residuals	6254.69	92		

QUERUB	$\operatorname{Sum.Sq}$	Df	F value	$\Pr(>F)$
chilling	35.70	2	0.46	0.63
forcing	668.59	1	17.39	0.00
photoperiod	364.39	1	9.48	0.00
chilling:forcing	174.11	2	2.26	0.11
chilling:photoperiod	110.91	2	1.44	0.24
forcing:photoperiod	15.92	1	0.41	0.52
Residuals	4652.62	121		