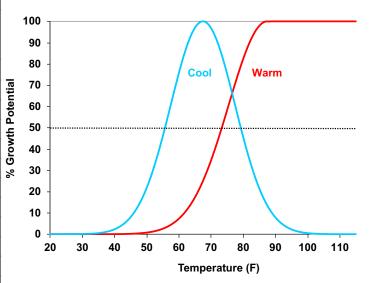## Growth Potential Values for cool season and warm season turf

We developed the growth potential model to explain myriad of ways in which weather impacts turf growth. The model considers turf growth to be good when the growth potential (GP) is between 50% and 100% (the best possible growth occurs at a GP of 100%). However, when weather conditions are either too hot or too cold for optimal turf growth, the GP falls below 50%, and turf becomes progressively more stressed. When the GP falls to 10% or lower, growth is extremely limited. Examples of growth potential graphs for selected U.S. locations are on the reverse side of this handout.

Percent Turfgrass Growth Potential

Average Temp C	Average Temp F	Cool Season %GP	Warm Season %GP	Average Temp C	Average Temp F	Cool Season %GP	Warm Season %GP
0.0	32	0	0	23.3	74	84	51
0.6	33	0	0	23.9	75	78	56
1.1	34	0	0	24.4	76	73	61
1.7	35	0	0	25.0	77	67	66
2.2	36	1	0	25.6	78	61	71
2.8	37	1	0	26.1	79	55	75
3.3	38	1	0	26.7	80	49	80
3.9	39	1	0	27.2	81	43	84
4.4	40	2	0	27.8	82	38	88
5.0	41	3	0	28.3	83	32	92
5.6	42	3	0	28.9	84	28	95
6.1	43	4	0	29.4	85	24	97
6.7	44	6	0	30.0	86	20	99
7.2	45	7	0	30.6	87	16	100
7.8	46	9	0	31.1	88	14	100
8.3	47	11	0	31.7	89	11	100
8.9	48	14	0	32.2	90	9	100
9.4	49	16	1	32.8	91	7	100
10.0	50	20	1	33.3	92	6	100
10.6	51	24	1	33.9	93	4	100
11.1	52	28	1	34.4	94	3	100
11.7	53	32	1	35.0	95	3	100
12.2	54	38	2	35.6	96	2	100
12.8	55	43	2	36.1	97	1	100
13.3	56	49	3	36.7	98	1	100
13.9	57	55	4	37.2	99	1	100
14.4	58	61	4	37.8	100	1	100
15.0	59	67	5	38.3	101	0	100
15.6	60	73	7	38.9	102	0	100

Equation for calculating growth potential

The optimum temperature for cool season turf is 67.5F, and for warm season turf is 87.5F. The variance is set to 10 for cool season turfgrasses and 12 for warm season turfgrasses. Warm season grasses are not restricted by temperatures above 87.5.

$$100 \times e^{\left(-\frac{1}{2}\left(\frac{\text{average temperature - optimum growth temperature}}{\text{variance}}\right)^2\right)}$$

PACE TURF

Growth potential graphs for select U.S. locations

Percent growth potential of cool (blue line) and warm-season turf (red line).

Worcester, MA

Richmond, VA

Guam

Gainesville, FL

Phoenix, AZ

Dallas, TX

Lexington, KY

Miami, FL

PACE TURF