

IMPORTANT NOTES:

These tables likely represent the "worst-case" scenario for probabilities of success. Data from the eastern corn-belt suggests that when a hybrid is planted later it requires less GDU's to reach physiological maturity than when planted at its optimal planting date. Their data suggest that GDU requirements for maturity are reduced by 6.8 GDU's for every day that planting occurs after May 1st. Unfortunately, I have not been able to find data from the Great Plains to either confirm that rate or suggest another rate.

It's reasonable to believe that corn hybrids here will also reduce their GDU requirement with later planting. To get a full view of possibilities I would recommend you look at the probabilities for the hybrid's maturity and then also the probabilities for a hybrid that is 3-6 days shorter. This will likely give you a realistic range of potential outcomes.

Different locations have different lengths of history in these calculations. This may affect the agreement of comparisons made between very close locations. However the effects of elevation and latitude are quite prevalent in some location comparisons.

For questions or to discuss further please do not hesitate to contact me.

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Alton		Historical Probability of Reaching Black Layer Before a 28° F Freeze - Alton, 1939-2016										
		Hybrid		Planting Date								
Relative Maturity	Black Layer GDU	17-Apr	24-Apr	1-May	8-May	15-May	22-May	29-May	5-Jun	12-Jun	19-Jun	26-Jun
118	2815	98.6%	98.6%	98.6%	97.3%	94.6%	90.5%	81.1%	59.5%	31.1%	14.9%	4.1%
113	2768	98.6%	98.6%	98.6%	98.6%	97.3%	91.9%	90.5%	71.6%	41.9%	17.6%	9.5%
110	2670	100.0%	100.0%	100.0%	100.0%	98.6%	97.3%	91.9%	87.8%	62.2%	29.7%	13.5%
108	2604	100.0%	100.0%	100.0%	100.0%	100.0%	97.3%	95.9%	90.5%	73.0%	47.3%	17.6%
105	2520	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	97.3%	91.9%	89.2%	59.5%	27.0%
103	2463	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	95.9%	89.2%	70.3%	41.9%
96	2357	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	94.6%	86.5%	59.5%
91	2250	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	94.6%	81.1%
Average GDU		3534	3465	3393	3312	3219	3114	3001	2877	2737	2585	2424
Maximum GDU		4150	4076	3994	3869	3729	3606	3527	3371	3194	3047	2915
Minimum GDU		2760	2751	2705	2678	2611	2540	2482	2392	2280	2133	1974

Atwood

Historical Probability of Reaching Black Layer Before a 28° F Freeze - Atwood, 1939-2016												
Hybrid		Planting Date										
Relative Maturity	Black Layer GDU	17-Apr	24-Apr	1-May	8-May	15-May	22-May	29-May	5-Jun	12-Jun	19-Jun	26-Jun
118	2815	91.0%	88.5%	79.5%	79.5%	66.7%	46.2%	20.5%	10.3%	3.8%	0.0%	0.0%
113	2768	96.2%	92.3%	87.2%	80.8%	74.4%	56.4%	33.3%	11.5%	6.4%	1.3%	0.0%
110	2670	97.4%	97.4%	96.2%	93.6%	80.8%	70.5%	57.7%	28.2%	10.3%	3.8%	0.0%
108	2604	98.7%	98.7%	97.4%	96.2%	91.0%	79.5%	66.7%	48.7%	15.4%	7.7%	1.3%
105	2520	98.7%	98.7%	98.7%	97.4%	94.9%	89.7%	76.9%	57.7%	32.1%	10.3%	3.8%
103	2463	98.7%	98.7%	98.7%	98.7%	97.4%	93.6%	84.6%	69.2%	52.6%	17.9%	7.7%
96	2357	98.7%	98.7%	98.7%	98.7%	98.7%	97.4%	94.9%	83.3%	66.7%	35.9%	10.3%
91	2250	100.0%	100.0%	100.0%	100.0%	98.7%	98.7%	97.4%	96.2%	83.3%	59.0%	30.8%
Average GDU		3158	3098	3033	2960	2877	2781	2680	2567	2442	2305	2157
Maximum GDU		3778	3726	3650	3532	3404	3318	3241	3095	2941	2814	2646
Minimum GDU		2346	2346	2317	2295	2245	2186	2145	2071	1994	1858	1712

Belleville

Historical Probability of Reaching Black Layer Before a 28° F Freeze - Belleville, 1948-2016												
Hybrid		Planting Date										
Relative Maturity	Black Layer GDU	17-Apr	24-Apr	1-May	8-May	15-May	22-May	29-May	5-Jun	12-Jun	19-Jun	26-Jun
118	2815	100.0%	100.0%	100.0%	100.0%	100.0%	95.7%	87.0%	75.4%	42.0%	18.8%	1.4%
113	2768	100.0%	100.0%	100.0%	100.0%	100.0%	97.1%	94.2%	79.7%	52.2%	21.7%	5.8%
110	2670	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	98.6%	94.2%	73.9%	39.1%	17.4%
108	2604	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	98.6%	82.6%	56.5%	21.7%
105	2520	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	98.6%	95.7%	73.9%	34.8%
103	2463	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	98.6%	84.1%	46.4%
96	2357	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	95.7%	73.9%
91	2250	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	98.6%	91.3%
Average GDU		3595	3528	3460	3378	3285	3180	3066	2941	2795	2638	2472
Maximum GDU		4156	4097	4043	3991	3840	3699	3551	3413	3243	3053	2870
Minimum GDU		3107	3061	2998	2933	2851	2746	2624	2500	2390	2242	2051

Beloit

Historical Probability of Reaching Black Layer Before a 28° F Freeze - Beloit, 1948-2016												
Hybrid		Planting Date										
Relative Maturity	Black Layer GDU	17-Apr	24-Apr	1-May	8-May	15-May	22-May	29-May	5-Jun	12-Jun	19-Jun	26-Jun
118	2815	98.6%	98.6%	98.6%	98.6%	98.6%	97.1%	94.2%	79.7%	55.1%	24.6%	7.2%
113	2768	98.6%	98.6%	98.6%	98.6%	98.6%	98.6%	97.1%	85.5%	63.8%	33.3%	8.7%
110	2670	100.0%	98.6%	98.6%	98.6%	98.6%	98.6%	98.6%	95.7%	81.2%	55.1%	21.7%
108	2604	100.0%	100.0%	98.6%	98.6%	98.6%	98.6%	98.6%	97.1%	88.4%	66.7%	29.0%
105	2520	100.0%	100.0%	100.0%	98.6%	98.6%	98.6%	98.6%	98.6%	95.7%	81.2%	50.7%
103	2463	100.0%	100.0%	100.0%	100.0%	98.6%	98.6%	98.6%	98.6%	97.1%	87.0%	59.4%
96	2357	100.0%	100.0%	100.0%	100.0%	100.0%	98.6%	98.6%	98.6%	98.6%	95.7%	82.6%
91	2250	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	98.6%	98.6%	98.6%	98.6%	91.3%
Average GDU		3660	3590	3518	3435	3341	3233	3116	2988	2841	2682	2513
Maximum GDU		4198	4124	4059	3946	3801	3701	3624	3472	3296	3142	2975
Minimum GDU		2677	2659	2579	2509	2430	2310	2219	2114	2032	1894	1774

Big Bow 4WSW

Historical Probability of Reaching Blacklayer Before a 28° F Freeze - Big Bow 4WSW, 1948-2016												
Hybrid		Planting Date										
Relative Maturity	Blacklayer GDU	17-Apr	24-Apr	1-May	8-May	15-May	22-May	29-May	5-Jun	12-Jun	19-Jun	26-Jun
118	2815	100.0%	100.0%	100.0%	100.0%	98.6%	95.7%	91.3%	75.4%	39.1%	18.8%	1.4%
113	2768	100.0%	100.0%	100.0%	100.0%	98.6%	97.1%	91.3%	84.1%	50.7%	24.6%	4.3%
110	2670	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	97.1%	92.8%	76.8%	39.1%	13.0%
108	2604	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	98.6%	95.7%	88.4%	58.0%	23.2%
105	2520	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	97.1%	94.2%	76.8%	36.2%
103	2463	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	95.7%	87.0%	47.8%
96	2357	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	94.2%	76.8%
91	2250	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	98.6%	94.2%
Average GDU		3617	3541	3462	3378	3281	3174	3058	2933	2793	2640	2477
Maximum GDU		4195	4099	4006	3880	3718	3626	3519	3376	3218	3068	2899
Minimum GDU		3055	2993	2917	2835	2750	2699	2588	2504	2366	2219	2058

Bison 3NW

Historical Probability of Reaching Black Layer Before a 28° F Freeze - Bison 3NW, 1939-2016												
Hybrid		Planting Date										
Relative Maturity	Black Layer GDU	17-Apr	24-Apr	1-May	8-May	15-May	22-May	29-May	5-Jun	12-Jun	19-Jun	26-Jun
118	2815	100.0%	100.0%	100.0%	100.0%	97.4%	96.2%	91.0%	78.2%	52.6%	19.2%	5.1%
113	2768	100.0%	100.0%	100.0%	100.0%	98.7%	97.4%	92.3%	85.9%	61.5%	29.5%	7.7%
110	2670	100.0%	100.0%	100.0%	100.0%	100.0%	98.7%	97.4%	91.0%	80.8%	48.7%	16.7%
108	2604	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	97.4%	97.4%	88.5%	62.8%	28.2%
105	2520	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	97.4%	94.9%	80.8%	43.6%
103	2463	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	96.2%	85.9%	60.3%
96	2357	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	98.7%	96.2%	80.8%
91	2250	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	97.4%	92.3%
Average GDU		3650	3578	3503	3419	3323	3214	3095	2966	2823	2667	2500
Maximum GDU		4387	4305	4215	4078	3900	3786	3690	3536	3363	3202	3034
Minimum GDU		2928	2911	2868	2833	2753	2663	2590	2467	2357	2209	2028

Brewster

Historical Probability of Reaching Black Layer Before a 28° F Freeze - Brewster, 1948-2016												
Hybrid		Planting Date										
Relative Maturity	Black Layer GDU	17-Apr	24-Apr	1-May	8-May	15-May	22-May	29-May	5-Jun	12-Jun	19-Jun	26-Jun
118	2815	92.8%	88.4%	85.5%	76.8%	65.2%	36.2%	14.5%	8.7%	5.8%	0.0%	0.0%
113	2768	94.2%	91.3%	87.0%	81.2%	71.0%	49.3%	18.8%	10.1%	5.8%	1.4%	0.0%
110	2670	95.7%	94.2%	94.2%	88.4%	85.5%	71.0%	50.7%	18.8%	10.1%	2.9%	0.0%
108	2604	98.6%	95.7%	94.2%	92.8%	88.4%	85.5%	63.8%	31.9%	11.6%	7.2%	1.4%
105	2520	98.6%	98.6%	95.7%	95.7%	92.8%	88.4%	82.6%	59.4%	18.8%	10.1%	2.9%
103	2463	98.6%	98.6%	98.6%	95.7%	94.2%	92.8%	87.0%	75.4%	36.2%	11.6%	7.2%
96	2357	100.0%	100.0%	100.0%	98.6%	98.6%	94.2%	92.8%	85.5%	69.6%	29.0%	10.1%
91	2250	100.0%	100.0%	100.0%	100.0%	100.0%	98.6%	95.7%	92.8%	85.5%	66.7%	17.4%
Average GDU		3122	3063	3002	2930	2850	2756	2658	2549	2425	2291	2145
Maximum GDU		3717	3674	3601	3508	3386	3264	3197	3069	2924	2791	2630
Minimum GDU		2408	2408	2374	2354	2296	2235	2181	2080	1993	1874	1729

Burr Oak

Historical Probability of Reaching Black Layer Before a 28° F Freeze - Burr Oak, 1949-2012												
Hybrid		Planting Date										
Relative Maturity	Black Layer GDU	17-Apr	24-Apr	1-May	8-May	15-May	22-May	29-May	5-Jun	12-Jun	19-Jun	26-Jun
118	2815	100.0%	98.4%	95.2%	93.7%	88.9%	85.7%	77.8%	65.1%	25.4%	7.9%	1.6%
113	2768	100.0%	100.0%	98.4%	95.2%	92.1%	88.9%	84.1%	74.6%	38.1%	9.5%	1.6%
110	2670	100.0%	100.0%	100.0%	100.0%	95.2%	92.1%	88.9%	82.5%	60.3%	22.2%	6.3%
108	2604	100.0%	100.0%	100.0%	100.0%	100.0%	95.2%	90.5%	85.7%	74.6%	39.7%	9.5%
105	2520	100.0%	100.0%	100.0%	100.0%	100.0%	98.4%	95.2%	90.5%	81.0%	61.9%	14.3%
103	2463	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	95.2%	93.7%	85.7%	74.6%	34.9%
96	2357	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	95.2%	93.7%	84.1%	63.5%
91	2250	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	95.2%	90.5%	79.4%
Average GDU		3477	3411	3342	3263	3173	3069	2957	2836	2696	2544	2381
Maximum GDU		4110	4038	3969	3850	3697	3601	3526	3372	3195	3037	2864
Minimum GDU		2845	2801	2748	2695	2617	2512	2415	2293	2198	2028	1860

Cimarron

Historical Probability of Reaching Black Layer Before a 28° F Freeze - Cimarron, 1939-2016												
Hybrid		Planting Date										
Relative Maturity	Black Layer GDU	17-Apr	24-Apr	1-May	8-May	15-May	22-May	29-May	5-Jun	12-Jun	19-Jun	26-Jun
118	2815	100.0%	98.7%	98.7%	97.4%	96.2%	93.6%	84.6%	71.8%	42.3%	15.4%	3.8%
113	2768	100.0%	100.0%	98.7%	97.4%	97.4%	94.9%	88.5%	76.9%	51.3%	21.8%	3.8%
110	2670	100.0%	100.0%	100.0%	100.0%	97.4%	96.2%	94.9%	87.2%	71.8%	38.5%	12.8%
108	2604	100.0%	100.0%	100.0%	100.0%	100.0%	97.4%	97.4%	91.0%	80.8%	56.4%	20.5%
105	2520	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	98.7%	96.2%	88.5%	71.8%	34.6%
103	2463	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	98.7%	97.4%	93.6%	79.5%	50.0%
96	2357	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	98.7%	97.4%	89.7%	71.8%
91	2250	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	98.7%	96.2%	88.5%
Average GDU		3590	3518	3441	3356	3261	3155	3039	2913	2772	2621	2458
Maximum GDU		4175	4102	4012	3885	3716	3659	3525	3398	3228	3066	2907
Minimum GDU		2818	2801	2756	2723	2655	2544	2421	2325	2213	2069	1916

Colby

Historical Probability of Reaching Black Layer Before a 28° F Freeze - Colby, 1900-2016												
Hybrid		Planting Date										
Relative Maturity	Black Layer GDU	17-Apr	24-Apr	1-May	8-May	15-May	22-May	29-May	5-Jun	12-Jun	19-Jun	26-Jun
118	2815	88.9%	83.8%	81.9%	78.1%	58.1%	43.8%	28.6%	16.2%	10.5%	1.0%	0.0%
113	2768	91.5%	88.6%	85.7%	81.9%	71.4%	52.4%	33.3%	17.1%	11.4%	1.9%	0.0%
110	2670	95.7%	93.3%	91.4%	85.7%	81.0%	73.3%	50.5%	31.4%	17.1%	10.5%	0.0%
108	2604	97.4%	96.2%	94.3%	91.4%	85.7%	80.0%	68.6%	46.7%	21.0%	13.3%	1.0%
105	2520	98.3%	97.1%	96.2%	95.2%	92.4%	86.7%	80.0%	59.0%	40.0%	18.1%	7.6%
103	2463	100.0%	99.0%	97.1%	95.2%	93.3%	90.5%	82.9%	78.1%	50.5%	21.0%	13.3%
96	2357	100.0%	100.0%	100.0%	98.1%	96.2%	94.3%	90.5%	84.8%	72.4%	44.8%	18.1%
91	2250	100.0%	100.0%	100.0%	100.0%	100.0%	97.1%	96.2%	91.4%	85.7%	61.9%	32.4%
Average GDU		3158	3099	3038	2969	2891	2799	2701	2593	2470	2336	2188
Maximum GDU		3849	3778	3689	3579	3460	3325	3236	3102	2944	2817	2650
Minimum GDU		2492	2421	2358	2302	2254	2144	2054	1984	1841	1706	1593

Concordia

Historical Probability of Reaching Black Layer Before a 28° F Freeze - Concordia, 1948-2016												
Hybrid		Planting Date										
Relative Maturity	Black Layer GDU	17-Apr	24-Apr	1-May	8-May	15-May	22-May	29-May	5-Jun	12-Jun	19-Jun	26-Jun
118	2815	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	94.2%	85.5%	55.1%	24.6%	10.1%
113	2768	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	97.1%	89.9%	68.1%	29.0%	11.6%
110	2670	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	97.1%	88.4%	52.2%	23.2%
108	2604	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	98.6%	89.9%	68.1%	26.1%
105	2520	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	97.1%	87.0%	47.8%
103	2463	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	89.9%	60.9%
96	2357	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	97.1%	85.5%
91	2250	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	97.1%
Average GDU		3656	3590	3523	3441	3351	3246	3131	3006	2859	2700	2531
Maximum GDU		4158	4113	4057	4010	3862	3720	3586	3439	3266	3098	2927
Minimum GDU		3138	3095	3045	3019	2948	2818	2721	2594	2473	2313	2119

Ellsworth

Historical Probability of Reaching Black Layer Before a 28° F Freeze - Ellsworth, 1948-2016												
Hybrid		Planting Date										
Relative Maturity	Black Layer GDU	17-Apr	24-Apr	1-May	8-May	15-May	22-May	29-May	5-Jun	12-Jun	19-Jun	26-Jun
118	2815	100.0%	100.0%	100.0%	100.0%	100.0%	95.7%	94.2%	91.3%	68.1%	26.1%	11.6%
113	2768	100.0%	100.0%	100.0%	100.0%	100.0%	98.6%	95.7%	92.8%	78.3%	33.3%	11.6%
110	2670	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	97.1%	95.7%	88.4%	59.4%	20.3%
108	2604	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	95.7%	92.8%	79.7%	30.4%
105	2520	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	94.2%	85.5%	53.6%
103	2463	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	97.1%	92.8%	71.0%
96	2357	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	95.7%	89.9%
91	2250	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	94.2%
Average GDU		3732	3658	3581	3493	3395	3283	3161	3031	2880	2718	2547
Maximum GDU		4379	4282	4191	4059	3894	3789	3707	3551	3367	3209	3034
Minimum GDU		3191	3113	3035	2976	2863	2723	2653	2526	2399	2264	2067

Garden City

Historical Probability of Reaching Black Layer Before a 28° F Freeze - Garden City 1948-2016												
Hybrid		Planting Date										
Relative Maturity	Black Layer GDU	17-Apr	24-Apr	1-May	8-May	15-May	22-May	29-May	5-Jun	12-Jun	19-Jun	26-Jun
118	2815	98.6%	98.6%	98.6%	97.1%	94.2%	88.4%	75.4%	58.0%	20.3%	11.6%	1.4%
113	2768	98.6%	98.6%	98.6%	98.6%	95.7%	89.9%	76.8%	69.6%	29.0%	14.5%	2.9%
110	2670	100.0%	100.0%	100.0%	98.6%	98.6%	94.2%	89.9%	79.7%	55.1%	20.3%	7.2%
108	2604	100.0%	100.0%	100.0%	100.0%	98.6%	98.6%	94.2%	87.0%	69.6%	33.3%	14.5%
105	2520	100.0%	100.0%	100.0%	100.0%	100.0%	98.6%	98.6%	92.8%	81.2%	55.1%	20.3%
103	2463	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	98.6%	97.1%	88.4%	69.6%	29.0%
96	2357	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	97.1%	84.1%	55.1%
91	2250	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	92.8%	78.3%
Average GDU		3477	3407	3336	3258	3167	3064	2953	2833	2696	2546	2386
Maximum GDU		4055	3978	3895	3788	3636	3593	3466	3332	3171	3029	2870
Minimum GDU		2738	2727	2684	2646	2575	2502	2453	2367	2264	2117	1972

Goodland

Historical Probability of Reaching Blacklayer Before a 28° F Freeze - Goodland, 1948-2016												
Hybrid		Planting Date										
Relative Maturity	Blacklayer GDU	17-Apr	24-Apr	1-May	8-May	15-May	22-May	29-May	5-Jun	12-Jun	19-Jun	26-Jun
118	2815	88.4%	81.2%	76.8%	59.4%	42.0%	26.1%	13.0%	4.3%	2.9%	0.0%	0.0%
113	2768	95.7%	89.9%	82.6%	76.8%	53.6%	29.0%	18.8%	8.7%	2.9%	0.0%	0.0%
110	2670	98.6%	98.6%	97.1%	89.9%	78.3%	56.5%	29.0%	18.8%	4.3%	2.9%	0.0%
108	2604	100.0%	100.0%	100.0%	95.7%	88.4%	78.3%	50.7%	23.2%	11.6%	2.9%	0.0%
105	2520	100.0%	100.0%	100.0%	100.0%	98.6%	88.4%	78.3%	44.9%	18.8%	7.2%	2.9%
103	2463	100.0%	100.0%	100.0%	100.0%	100.0%	97.1%	84.1%	60.9%	30.4%	13.0%	2.9%
96	2357	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	97.1%	88.4%	56.5%	27.5%	7.2%
91	2250	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	97.1%	85.5%	44.9%	18.8%
Average GDU		3063	3006	2951	2883	2808	2720	2628	2524	2403	2272	2128
Maximum GDU		3643	3589	3527	3411	3281	3213	3146	3015	2876	2750	2582
Minimum GDU		2657	2653	2623	2596	2495	2367	2332	2235	2096	1971	1870

Hays

Historical Probability of Reaching Black Layer Before a 28° F Freeze - Hays, 1892-2016												
Hybrid		Planting Date										
Relative Maturity	Black Layer GDU	17-Apr	24-Apr	1-May	8-May	15-May	22-May	29-May	5-Jun	12-Jun	19-Jun	26-Jun
118	2815	100.0%	100.0%	99.0%	98.1%	92.4%	85.7%	78.1%	61.0%	24.8%	14.3%	2.9%
113	2768	100.0%	100.0%	99.0%	99.0%	98.1%	88.6%	81.9%	69.5%	35.2%	18.1%	5.7%
110	2670	100.0%	100.0%	100.0%	99.0%	99.0%	97.1%	87.6%	81.9%	62.9%	26.7%	12.4%
108	2604	100.0%	100.0%	100.0%	100.0%	99.0%	99.0%	92.4%	85.7%	76.2%	38.1%	19.0%
105	2520	100.0%	100.0%	100.0%	100.0%	100.0%	99.0%	99.0%	92.4%	83.8%	64.8%	25.7%
103	2463	100.0%	100.0%	100.0%	100.0%	100.0%	99.0%	99.0%	96.2%	87.6%	74.3%	34.3%
96	2357	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	99.0%	94.3%	83.8%	64.8%
91	2250	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	99.0%	99.0%	91.4%	81.0%
Average GDU		3523	3455	3384	3305	3216	3113	3001	2879	2741	2590	2429
Maximum GDU		4104	4040	3950	3842	3745	3610	3516	3366	3222	3060	2879
Minimum GDU		2891	2871	2756	2631	2533	2461	2364	2232	2091	1965	1806

Hill City

Historical Probability of Reaching Black Layer Before a 28° F Freeze - Hill City, 1948-2016												
Hybrid		Planting Date										
Relative Maturity	Black Layer GDU	17-Apr	24-Apr	1-May	8-May	15-May	22-May	29-May	5-Jun	12-Jun	19-Jun	26-Jun
118	2815	98.6%	98.6%	98.6%	95.7%	94.2%	89.9%	72.5%	42.0%	18.8%	7.2%	1.4%
113	2768	98.6%	98.6%	98.6%	97.1%	94.2%	91.3%	79.7%	62.3%	23.2%	13.0%	1.4%
110	2670	100.0%	100.0%	98.6%	98.6%	97.1%	94.2%	89.9%	75.4%	47.8%	18.8%	1.4%
108	2604	100.0%	100.0%	100.0%	100.0%	98.6%	95.7%	92.8%	88.4%	62.3%	27.5%	13.0%
105	2520	100.0%	100.0%	100.0%	100.0%	100.0%	98.6%	94.2%	92.8%	81.2%	46.4%	17.4%
103	2463	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	97.1%	94.2%	91.3%	60.9%	24.6%
96	2357	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	98.6%	94.2%	85.5%	47.8%
91	2250	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	98.6%	92.8%	72.5%
Average GDU		3421	3357	3290	3214	3127	3027	2920	2801	2665	2517	2360
Maximum GDU		4020	3956	3885	3763	3616	3535	3466	3319	3151	3004	2827
Minimum GDU		2708	2698	2657	2631	2577	2505	2420	2299	2187	2058	1912

Hoxie

Historical Probability of Reaching Black Layer Before a 28° F Freeze - Hoxie, 1939-2016												
Hybrid		Planting Date										
Relative Maturity	Black Layer GDU	17-Apr	24-Apr	1-May	8-May	15-May	22-May	29-May	5-Jun	12-Jun	19-Jun	26-Jun
118	2815	97.4%	96.2%	96.2%	93.6%	92.3%	84.6%	67.9%	39.7%	17.9%	5.1%	0.0%
113	2768	98.7%	97.4%	96.2%	96.2%	93.6%	88.5%	75.6%	52.6%	24.4%	7.7%	0.0%
110	2670	98.7%	98.7%	98.7%	97.4%	94.9%	93.6%	87.2%	73.1%	46.2%	16.7%	5.1%
108	2604	98.7%	98.7%	98.7%	98.7%	97.4%	93.6%	92.3%	82.1%	59.0%	26.9%	7.7%
105	2520	98.7%	98.7%	98.7%	98.7%	98.7%	96.2%	94.9%	89.7%	74.4%	43.6%	16.7%
103	2463	100.0%	100.0%	100.0%	100.0%	98.7%	98.7%	96.2%	91.0%	82.1%	59.0%	23.1%
96	2357	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	98.7%	96.2%	89.7%	79.5%	44.9%
91	2250	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	96.2%	89.7%	69.2%
Average GDU		3403	3336	3267	3188	3099	2999	2891	2772	2640	2495	2339
Maximum GDU		3993	3941	3830	3701	3611	3480	3368	3222	3060	2918	2745
Minimum GDU		2520	2520	2488	2469	2423	2367	2330	2256	2166	2023	1881

Johnson

Historical Probability of Reaching Blacklayer Before a 28° F Freeze - Johnson 1991-2016*												
Hybrid		Planting Date										
Relative Maturity	Blacklayer GDU	17-Apr	24-Apr	1-May	8-May	15-May	22-May	29-May	5-Jun	12-Jun	19-Jun	26-Jun
118	2815	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	92.3%	73.1%	42.3%	23.1%	0.0%
113	2768	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	96.2%	80.8%	53.8%	30.8%	11.5%
110	2670	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	96.2%	76.9%	42.3%	19.2%
108	2604	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	92.3%	61.5%	30.8%
105	2520	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	96.2%	76.9%	38.5%
103	2463	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	84.6%	50.0%
96	2357	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	96.2%	76.9%
91	2250	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	96.2%
Average GDU		3612	3543	3473	3393	3298	3190	3074	2946	2806	2657	2492
Maximum GDU		3914	3862	3793	3726	3625	3582	3448	3327	3159	2988	2802
Minimum GDU		3187	3167	3088	3038	2951	2842	2733	2608	2475	2331	2155

***Note: Johnson is a relatively shorter dataset than other locations, recommend the user also consult Big Bow, Syracuse, and Ulysses tables**

Lakin

Historical Probability of Reaching Black Layer Before a 28° F Freeze - Lakin, 1893-2016												
Hybrid		Planting Date										
Relative Maturity	Black Layer GDU	17-Apr	24-Apr	1-May	8-May	15-May	22-May	29-May	5-Jun	12-Jun	19-Jun	26-Jun
118	2815	100.0%	100.0%	99.0%	98.1%	96.2%	87.6%	77.1%	53.3%	28.6%	9.5%	1.9%
113	2768	100.0%	100.0%	99.0%	98.1%	97.1%	92.4%	81.0%	67.6%	37.1%	14.3%	2.9%
110	2670	100.0%	100.0%	100.0%	99.0%	98.1%	98.1%	90.5%	81.0%	57.1%	29.5%	7.6%
108	2604	100.0%	100.0%	100.0%	100.0%	98.1%	98.1%	94.3%	88.6%	72.4%	38.1%	13.3%
105	2520	100.0%	100.0%	100.0%	100.0%	100.0%	98.1%	98.1%	95.2%	83.8%	55.2%	27.6%
103	2463	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	98.1%	97.1%	88.6%	71.4%	35.2%
96	2357	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	98.1%	98.1%	96.2%	83.8%	58.1%
91	2250	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	98.1%	98.1%	95.2%	81.9%
Average GDU		3538	3465	3389	3305	3210	3105	2990	2867	2731	2583	2424
Maximum GDU		4278	4201	4109	3974	3809	3711	3620	3471	3304	3153	2978
Minimum GDU		2860	2833	2764	2652	2574	2470	2331	2199	2077	1972	1833

Leoti

Historical Probability of Reaching Black Layer Before a 28° F Freeze - Leoti, 1939-2016												
Hybrid		Planting Date										
Relative Maturity	Black Layer GDU	17-Apr	24-Apr	1-May	8-May	15-May	22-May	29-May	5-Jun	12-Jun	19-Jun	26-Jun
118	2815	98.7%	97.4%	94.9%	91.0%	82.1%	65.4%	41.0%	15.4%	6.4%	1.3%	0.0%
113	2768	98.7%	98.7%	96.2%	92.3%	88.5%	75.6%	52.6%	24.4%	7.7%	1.3%	1.3%
110	2670	98.7%	98.7%	98.7%	98.7%	93.6%	88.5%	74.4%	50.0%	21.8%	6.4%	1.3%
108	2604	98.7%	98.7%	98.7%	98.7%	96.2%	93.6%	87.2%	60.3%	38.5%	10.3%	1.3%
105	2520	100.0%	100.0%	98.7%	98.7%	98.7%	97.4%	89.7%	83.3%	48.7%	23.1%	3.8%
103	2463	100.0%	100.0%	100.0%	100.0%	98.7%	98.7%	93.6%	88.5%	66.7%	37.2%	10.3%
96	2357	100.0%	100.0%	100.0%	100.0%	100.0%	98.7%	98.7%	96.2%	84.6%	59.0%	23.1%
91	2250	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	98.7%	93.6%	82.1%	47.4%
Average GDU		3270	3207	3139	3065	2979	2883	2779	2665	2537	2398	2247
Maximum GDU		3891	3827	3749	3638	3488	3404	3347	3214	3059	2929	2773
Minimum GDU		2546	2540	2505	2477	2413	2346	2304	2228	2136	2003	1860

Lincoln 1SE

Historical Probability of Reaching Black Layer Before a 28° F Freeze - Lincoln 1SE, 1939-2016												
Hybrid		Planting Date										
Relative Maturity	Black Layer GDU	17-Apr	24-Apr	1-May	8-May	15-May	22-May	29-May	5-Jun	12-Jun	19-Jun	26-Jun
118	2815	100.0%	100.0%	100.0%	98.7%	98.7%	97.4%	92.3%	83.3%	57.7%	29.5%	7.7%
113	2768	100.0%	100.0%	100.0%	100.0%	98.7%	98.7%	94.9%	89.7%	74.4%	35.9%	14.1%
110	2670	100.0%	100.0%	100.0%	100.0%	100.0%	98.7%	98.7%	93.6%	85.9%	53.8%	20.5%
108	2604	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	98.7%	94.9%	91.0%	71.8%	33.3%
105	2520	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	98.7%	93.6%	87.2%	50.0%
103	2463	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	94.9%	89.7%	65.4%
96	2357	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	93.6%	84.6%
91	2250	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	98.7%	91.0%
Average GDU		3716	3643	3566	3478	3380	3268	3146	3014	2864	2705	2535
Maximum GDU		4341	4258	4174	4040	3875	3766	3683	3526	3343	3180	3025
Minimum GDU		2910	2893	2843	2812	2738	2663	2599	2499	2373	2223	2064

Ness City

Historical Probability of Reaching Black Layer Before a 28° F Freeze - Ness City, 1948-2016												
Hybrid		Planting Date										
Relative Maturity	Black Layer GDU	17-Apr	24-Apr	1-May	8-May	15-May	22-May	29-May	5-Jun	12-Jun	19-Jun	26-Jun
118	2815	100.0%	100.0%	100.0%	100.0%	98.6%	94.2%	91.3%	71.0%	50.7%	15.9%	4.3%
113	2768	100.0%	100.0%	100.0%	100.0%	98.6%	97.1%	94.2%	84.1%	59.4%	20.3%	7.2%
110	2670	100.0%	100.0%	100.0%	100.0%	100.0%	98.6%	97.1%	94.2%	72.5%	43.5%	14.5%
108	2604	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	98.6%	94.2%	87.0%	60.9%	18.8%
105	2520	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	98.6%	98.6%	92.8%	69.6%	36.2%
103	2463	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	98.6%	94.2%	88.4%	55.1%
96	2357	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	98.6%	94.2%	72.5%
91	2250	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	98.6%	91.3%
Average GDU		3622	3549	3473	3389	3292	3182	3064	2937	2794	2639	2473
Maximum GDU		4314	4232	4143	4016	3869	3733	3646	3493	3321	3155	2981
Minimum GDU		3147	3053	2976	2858	2743	2638	2502	2388	2262	2126	1954

Norton 9SSE

Historical Probability of Reaching Black Layer Before a 28° F Freeze - Norton 9SSE, 1939-2016												
Hybrid		Planting Date										
Relative Maturity	Black Layer GDU	17-Apr	24-Apr	1-May	8-May	15-May	22-May	29-May	5-Jun	12-Jun	19-Jun	26-Jun
118	2815	98.7%	97.4%	97.4%	96.2%	89.7%	80.8%	66.7%	37.2%	21.8%	7.7%	0.0%
113	2768	98.7%	97.4%	97.4%	96.2%	93.6%	88.5%	75.6%	46.2%	28.2%	11.5%	1.3%
110	2670	100.0%	100.0%	98.7%	97.4%	96.2%	92.3%	85.9%	74.4%	39.7%	23.1%	5.1%
108	2604	100.0%	100.0%	100.0%	100.0%	97.4%	96.2%	92.3%	82.1%	55.1%	30.8%	7.7%
105	2520	100.0%	100.0%	100.0%	100.0%	100.0%	96.2%	96.2%	91.0%	74.4%	38.5%	20.5%
103	2463	100.0%	100.0%	100.0%	100.0%	100.0%	98.7%	96.2%	92.3%	84.6%	52.6%	29.5%
96	2357	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	98.7%	97.4%	92.3%	83.3%	43.6%
91	2250	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	98.7%	97.4%	92.3%	69.2%
Average GDU		3387	3323	3256	3181	3095	2999	2894	2777	2647	2504	2350
Maximum GDU		3957	3895	3818	3703	3567	3479	3403	3259	3091	2950	2781
Minimum GDU		2684	2679	2634	2613	2525	2443	2329	2217	2109	1992	1855

Oberlin

Historical Probability of Reaching Black Layer Before a 28° F Freeze - Oberlin, 1893-2016												
Hybrid		Planting Date										
Relative Maturity	Black Layer GDU	17-Apr	24-Apr	1-May	8-May	15-May	22-May	29-May	5-Jun	12-Jun	19-Jun	26-Jun
118	2815	96.0%	91.4%	88.6%	84.8%	74.3%	65.7%	43.8%	22.9%	12.4%	1.9%	1.0%
113	2768	96.8%	94.3%	89.5%	88.6%	78.1%	70.5%	55.2%	33.3%	16.2%	2.9%	1.0%
110	2670	98.4%	97.1%	95.2%	91.4%	87.6%	76.2%	71.4%	51.4%	24.8%	10.5%	1.9%
108	2604	98.4%	98.1%	97.1%	94.3%	91.4%	86.7%	76.2%	60.0%	38.1%	17.1%	2.9%
105	2520	99.2%	99.0%	98.1%	97.1%	93.3%	91.4%	83.8%	73.3%	53.3%	25.7%	9.5%
103	2463	99.2%	99.0%	99.0%	98.1%	97.1%	93.3%	88.6%	79.0%	63.8%	34.3%	15.2%
96	2357	100.0%	99.0%	99.0%	99.0%	98.1%	98.1%	92.4%	87.6%	78.1%	56.2%	26.7%
91	2250	100.0%	100.0%	100.0%	99.0%	99.0%	98.1%	98.1%	93.3%	87.6%	76.2%	49.5%
Average GDU		3270	3207	3141	3066	2981	2882	2777	2661	2533	2391	2239
Maximum GDU		4143	4074	3960	3846	3723	3620	3502	3368	3230	3038	2869
Minimum GDU		2399	2331	2279	2223	2168	2050	1952	1904	1819	1719	1605

Phillipsburg

Historical Probability of Reaching Black Layer Before a 28° F Freeze - Phillipsburg, 1891-2016												
Hybrid		Planting Date										
Relative Maturity	Black Layer GDU	17-Apr	24-Apr	1-May	8-May	15-May	22-May	29-May	5-Jun	12-Jun	19-Jun	26-Jun
118	2815	99.2%	99.0%	98.1%	97.1%	91.4%	82.9%	73.3%	59.0%	31.4%	18.1%	1.9%
113	2768	100.0%	99.0%	99.0%	97.1%	96.2%	84.8%	80.0%	65.7%	41.0%	20.0%	8.6%
110	2670	100.0%	100.0%	99.0%	99.0%	98.1%	96.2%	86.7%	78.1%	60.0%	31.4%	19.0%
108	2604	100.0%	100.0%	99.0%	99.0%	99.0%	97.1%	91.4%	84.8%	72.4%	40.0%	19.0%
105	2520	100.0%	100.0%	100.0%	100.0%	99.0%	99.0%	97.1%	91.4%	81.0%	61.9%	30.5%
103	2463	100.0%	100.0%	100.0%	100.0%	99.0%	99.0%	98.1%	93.3%	86.7%	73.3%	37.1%
96	2357	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	99.0%	99.0%	93.3%	83.8%	61.0%
91	2250	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	99.0%	98.1%	90.5%	79.0%
Average GDU		3512	3444	3374	3295	3205	3103	2991	2869	2733	2583	2423
Maximum GDU		4311	4233	4144	4016	3859	3754	3676	3516	3336	3178	2999
Minimum GDU		2786	2694	2603	2555	2437	2385	2293	2235	2135	2026	1900

Plainville 4WNW

Historical Probability of Reaching Black Layer Before a 28° F Freeze - Plainville 4WNW, 1939-2016												
Hybrid		Planting Date										
Relative Maturity	Black Layer GDU	17-Apr	24-Apr	1-May	8-May	15-May	22-May	29-May	5-Jun	12-Jun	19-Jun	26-Jun
118	2815	100.0%	100.0%	98.7%	97.4%	94.9%	93.6%	87.2%	70.5%	37.2%	19.2%	2.6%
113	2768	100.0%	100.0%	100.0%	98.7%	96.2%	94.9%	91.0%	75.6%	46.2%	25.6%	5.1%
110	2670	100.0%	100.0%	100.0%	100.0%	98.7%	96.2%	94.9%	89.7%	71.8%	35.9%	12.8%
108	2604	100.0%	100.0%	100.0%	100.0%	98.7%	98.7%	96.2%	94.9%	78.2%	44.9%	25.6%
105	2520	100.0%	100.0%	100.0%	100.0%	100.0%	98.7%	96.2%	96.2%	93.6%	73.1%	30.8%
103	2463	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	98.7%	96.2%	96.2%	76.9%	43.6%
96	2357	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	96.2%	93.6%	73.1%
91	2250	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	96.2%	87.2%
Average GDU		3536	3471	3403	3326	3238	3138	3029	2907	2771	2622	2460
Maximum GDU		4242	4172	4088	3966	3805	3720	3650	3512	3336	3175	3005
Minimum GDU		2897	2862	2800	2702	2597	2491	2430	2384	2265	2134	1978

Quinter

Historical Probability of Reaching Black Layer Before a 28° F Freeze - Quinter, 1939-2016												
Hybrid		Planting Date										
Relative Maturity	Black Layer GDU	17-Apr	24-Apr	1-May	8-May	15-May	22-May	29-May	5-Jun	12-Jun	19-Jun	26-Jun
118	2815	100.0%	98.7%	97.4%	94.9%	89.7%	80.8%	59.0%	43.6%	24.4%	7.7%	0.0%
113	2768	100.0%	100.0%	98.7%	96.2%	93.6%	87.2%	74.4%	51.3%	29.5%	10.3%	0.0%
110	2670	100.0%	100.0%	100.0%	100.0%	97.4%	93.6%	88.5%	66.7%	43.6%	25.6%	5.1%
108	2604	100.0%	100.0%	100.0%	100.0%	98.7%	94.9%	91.0%	82.1%	56.4%	30.8%	9.0%
105	2520	100.0%	100.0%	100.0%	100.0%	100.0%	98.7%	94.9%	88.5%	70.5%	42.3%	20.5%
103	2463	100.0%	100.0%	100.0%	100.0%	100.0%	98.7%	97.4%	93.6%	82.1%	53.8%	29.5%
96	2357	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	93.6%	78.2%	42.3%
91	2250	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	97.4%	92.3%	70.5%
Average GDU		3371	3310	3245	3173	3091	2997	2893	2778	2649	2506	2352
Maximum GDU		3943	3893	3788	3674	3590	3463	3375	3237	3077	2931	2768
Minimum GDU		2831	2782	2732	2707	2582	2461	2406	2359	2241	2101	1977

Russell Springs

Historical Probability of Reaching Black Layer Before a 28° F Freeze - Russell Springs, 1949-2012												
Hybrid		Planting Date										
Relative Maturity	Black Layer GDU	17-Apr	24-Apr	1-May	8-May	15-May	22-May	29-May	5-Jun	12-Jun	19-Jun	26-Jun
118	2815	98.4%	96.9%	93.8%	92.2%	87.5%	73.4%	42.2%	25.0%	9.4%	1.6%	1.6%
113	2768	98.4%	98.4%	96.9%	93.8%	89.1%	76.6%	51.6%	32.8%	14.1%	3.1%	1.6%
110	2670	98.4%	98.4%	98.4%	98.4%	96.9%	89.1%	79.7%	51.6%	25.0%	9.4%	1.6%
108	2604	98.4%	98.4%	98.4%	98.4%	96.9%	92.2%	85.9%	67.2%	37.5%	14.1%	3.1%
105	2520	100.0%	100.0%	98.4%	98.4%	98.4%	96.9%	92.2%	82.8%	53.1%	23.4%	9.4%
103	2463	100.0%	100.0%	100.0%	100.0%	98.4%	98.4%	95.3%	89.1%	73.4%	37.5%	10.9%
96	2357	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	98.4%	96.9%	89.1%	60.9%	26.6%
91	2250	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	93.8%	82.8%	50.0%
Average GDU		3320	3252	3183	3103	3014	2913	2806	2691	2559	2417	2264
Maximum GDU		4052	3997	3905	3784	3633	3546	3469	3326	3152	3016	2838
Minimum GDU		2567	2564	2516	2489	2426	2361	2328	2255	2161	2024	1874

Scott City

Historical Probability of Reaching Black Layer Before a 28° F Freeze - Scott City, 1948-2016												
Hybrid		Planting Date										
Relative Maturity	Black Layer GDU	17-Apr	24-Apr	1-May	8-May	15-May	22-May	29-May	5-Jun	12-Jun	19-Jun	26-Jun
118	2815	98.6%	98.6%	98.6%	97.1%	92.8%	89.9%	73.9%	47.8%	24.6%	7.2%	0.0%
113	2768	98.6%	98.6%	98.6%	97.1%	97.1%	91.3%	78.3%	59.4%	27.5%	10.1%	1.4%
110	2670	98.6%	98.6%	98.6%	98.6%	97.1%	97.1%	89.9%	76.8%	47.8%	21.7%	4.3%
108	2604	100.0%	100.0%	98.6%	98.6%	98.6%	97.1%	95.7%	84.1%	65.2%	30.4%	10.1%
105	2520	100.0%	100.0%	100.0%	100.0%	98.6%	97.1%	97.1%	91.3%	78.3%	47.8%	21.7%
103	2463	100.0%	100.0%	100.0%	100.0%	100.0%	98.6%	98.6%	95.7%	85.5%	63.8%	27.5%
96	2357	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	98.6%	98.6%	95.7%	81.2%	50.7%
91	2250	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	98.6%	94.2%	76.8%
Average GDU		3454	3384	3311	3231	3139	3036	2926	2806	2670	2522	2364
Maximum GDU		4005	3945	3856	3734	3579	3494	3408	3269	3113	2965	2804
Minimum GDU		2613	2607	2571	2538	2472	2399	2357	2274	2182	2041	1893

Sharon Springs

Historical Probability of Reaching Black Layer Before a 28° F Freeze - Sharon Springs, 1948-2016												
Hybrid		Planting Date										
Relative Maturity	Black Layer GDU	17-Apr	24-Apr	1-May	8-May	15-May	22-May	29-May	5-Jun	12-Jun	19-Jun	26-Jun
118	2815	100.0%	100.0%	100.0%	97.1%	94.2%	87.0%	66.7%	31.9%	13.0%	1.4%	0.0%
113	2768	100.0%	100.0%	100.0%	100.0%	95.7%	89.9%	76.8%	43.5%	17.4%	2.9%	1.4%
110	2670	100.0%	100.0%	100.0%	100.0%	100.0%	95.7%	89.9%	73.9%	37.7%	13.0%	1.4%
108	2604	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	95.7%	88.4%	49.3%	21.7%	1.4%
105	2520	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	98.6%	95.7%	79.7%	37.7%	11.6%
103	2463	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	95.7%	88.4%	47.8%	15.9%
96	2357	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	94.2%	82.6%	40.6%
91	2250	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	94.2%	68.1%
Average GDU		3404	3334	3263	3184	3093	2990	2882	2763	2628	2483	2327
Maximum GDU		4003	3936	3848	3723	3573	3468	3385	3240	3085	2946	2776
Minimum GDU		2957	2889	2853	2799	2725	2620	2520	2410	2294	2164	1996

Smith Center

Historical Probability of Reaching Black Layer Before a 28° F Freeze - Smith Center, 1948-2016												
Hybrid		Planting Date										
Relative Maturity	Black Layer GDU	17-Apr	24-Apr	1-May	8-May	15-May	22-May	29-May	5-Jun	12-Jun	19-Jun	26-Jun
118	2815	100.0%	100.0%	100.0%	100.0%	98.6%	95.7%	92.8%	76.8%	43.5%	10.1%	1.4%
113	2768	100.0%	100.0%	100.0%	100.0%	100.0%	97.1%	94.2%	82.6%	55.1%	23.2%	2.9%
110	2670	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	95.7%	94.2%	73.9%	37.7%	5.8%
108	2604	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	94.2%	88.4%	60.9%	17.4%
105	2520	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	98.6%	94.2%	72.5%	36.2%
103	2463	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	94.2%	84.1%	55.1%
96	2357	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	94.2%	73.9%
91	2250	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	98.6%	92.8%
Average GDU		3605	3534	3461	3377	3282	3175	3059	2933	2787	2629	2462
Maximum GDU		4143	4064	3988	3866	3711	3611	3529	3368	3189	3032	2855
Minimum GDU		2944	2930	2897	2865	2802	2714	2630	2502	2388	2249	2082

St. Francis

Historical Probability of Reaching Black Layer Before a 28° F Freeze - St. Francis, 1908-2016												
Hybrid		Planting Date										
Relative Maturity	Black Layer GDU	17-Apr	24-Apr	1-May	8-May	15-May	22-May	29-May	5-Jun	12-Jun	19-Jun	26-Jun
118	2815	94.5%	89.5%	82.9%	78.1%	71.4%	54.3%	30.5%	12.4%	5.7%	1.0%	0.0%
113	2768	94.5%	92.4%	88.6%	81.0%	76.2%	63.8%	39.0%	18.1%	9.5%	1.0%	0.0%
110	2670	96.3%	96.2%	94.3%	93.3%	81.0%	75.2%	65.7%	36.2%	15.2%	4.8%	1.0%
108	2604	98.2%	97.1%	96.2%	95.2%	92.4%	79.0%	73.3%	55.2%	22.9%	10.5%	1.0%
105	2520	99.1%	99.0%	98.1%	96.2%	96.2%	88.6%	79.0%	70.5%	41.0%	16.2%	6.7%
103	2463	100.0%	100.0%	100.0%	98.1%	96.2%	95.2%	81.9%	76.2%	58.1%	23.8%	10.5%
96	2357	100.0%	100.0%	100.0%	100.0%	99.0%	97.1%	96.2%	83.8%	74.3%	51.4%	18.1%
91	2250	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	98.1%	96.2%	84.8%	71.4%	35.2%
Average GDU		3188	3126	3064	2991	2911	2817	2716	2605	2482	2347	2199
Maximum GDU		3861	3797	3726	3602	3465	3373	3298	3156	3009	2875	2708
Minimum GDU		2515	2515	2476	2447	2326	2294	2196	2076	1979	1888	1770

Syracuse

Historical Probability of Reaching Black Layer Before a 28° F Freeze - Syracuse, 1939-2012												
Hybrid		Planting Date										
Relative Maturity	Black Layer GDU	17-Apr	24-Apr	1-May	8-May	15-May	22-May	29-May	5-Jun	12-Jun	19-Jun	26-Jun
118	2815	100.0%	100.0%	100.0%	97.3%	89.2%	82.4%	70.3%	41.9%	16.2%	2.7%	0.0%
113	2768	100.0%	100.0%	100.0%	98.6%	93.2%	87.8%	75.7%	50.0%	18.9%	9.5%	1.4%
110	2670	100.0%	100.0%	100.0%	100.0%	98.6%	90.5%	87.8%	75.7%	45.9%	16.2%	1.4%
108	2604	100.0%	100.0%	100.0%	100.0%	100.0%	97.3%	90.5%	81.1%	58.1%	23.0%	8.1%
105	2520	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	97.3%	89.2%	75.7%	44.6%	13.5%
103	2463	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	98.6%	91.9%	81.1%	58.1%	18.9%
96	2357	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	98.6%	90.5%	75.7%	47.3%
91	2250	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	95.9%	90.5%	71.6%
Average GDU		3443	3372	3295	3210	3115	3008	2896	2772	2636	2489	2332
Maximum GDU		4071	3994	3906	3778	3620	3523	3430	3288	3123	2972	2805
Minimum GDU		2950	2885	2833	2736	2666	2552	2437	2313	2171	2021	1855

Tribune

Historical Probability of Reaching Black Layer Before a 28° F Freeze - Tribune, 1900-2016												
Hybrid		Planting Date										
Relative Maturity	Black Layer GDU	17-Apr	24-Apr	1-May	8-May	15-May	22-May	29-May	5-Jun	12-Jun	19-Jun	26-Jun
118	2815	94.9%	88.6%	84.8%	79.0%	67.6%	45.7%	29.5%	11.4%	1.9%	1.0%	0.0%
113	2768	96.6%	93.3%	87.6%	84.8%	73.3%	54.3%	35.2%	16.2%	4.8%	1.0%	0.0%
110	2670	98.3%	98.1%	96.2%	90.5%	85.7%	76.2%	57.1%	32.4%	12.4%	2.9%	1.0%
108	2604	98.3%	98.1%	98.1%	96.2%	91.4%	84.8%	68.6%	43.8%	24.8%	6.7%	1.0%
105	2520	98.3%	98.1%	98.1%	98.1%	97.1%	93.3%	81.0%	63.8%	37.1%	13.3%	3.8%
103	2463	100.0%	99.0%	98.1%	98.1%	97.1%	94.3%	87.6%	77.1%	48.6%	26.7%	5.7%
96	2357	100.0%	100.0%	99.0%	99.0%	98.1%	97.1%	95.2%	89.5%	75.2%	43.8%	12.4%
91	2250	100.0%	100.0%	100.0%	100.0%	99.0%	99.0%	98.1%	95.2%	86.7%	67.6%	31.4%
Average GDU		3190	3127	3063	2990	2907	2812	2710	2599	2475	2340	2193
Maximum GDU		3793	3742	3664	3544	3406	3322	3249	3121	2977	2846	2690
Minimum GDU		2474	2422	2349	2320	2224	2195	2111	2047	1942	1834	1718

Ulysses 1SE

Historical Probability of Reaching Blacklayer Before a 28° F Freeze - Ulysses 1SE, 1939-2016												
Hybrid		Planting Date										
Relative Maturity	Blacklayer GDU	17-Apr	24-Apr	1-May	8-May	15-May	22-May	29-May	5-Jun	12-Jun	19-Jun	26-Jun
118	2815	100.0%	100.0%	100.0%	98.7%	96.2%	93.6%	85.9%	69.2%	39.7%	11.5%	1.3%
113	2768	100.0%	100.0%	100.0%	100.0%	97.4%	94.9%	91.0%	78.2%	48.7%	15.4%	2.6%
110	2670	100.0%	100.0%	100.0%	100.0%	100.0%	97.4%	94.9%	87.2%	70.5%	37.2%	10.3%
108	2604	100.0%	100.0%	100.0%	100.0%	100.0%	98.7%	96.2%	93.6%	82.1%	51.3%	15.4%
105	2520	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	98.7%	94.9%	89.7%	69.2%	33.3%
103	2463	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	96.2%	92.3%	80.8%	48.7%
96	2357	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	96.2%	89.7%	69.2%
91	2250	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	93.6%	87.2%
Average GDU		3581	3507	3428	3342	3244	3136	3021	2895	2756	2605	2443
Maximum GDU		4164	4066	3971	3846	3684	3577	3484	3340	3181	3032	2866
Minimum GDU		2983	2938	2862	2780	2693	2571	2505	2432	2295	2149	1991

WaKeeney

Historical Probability of Reaching Black Layer Before a 28° F Freeze - WaKeeney, 1893-2016												
Hybrid		Planting Date										
Relative Maturity	Black Layer GDU	17-Apr	24-Apr	1-May	8-May	15-May	22-May	29-May	5-Jun	12-Jun	19-Jun	26-Jun
118	2815	99.2%	99.0%	98.1%	96.2%	95.2%	90.5%	79.0%	63.8%	37.1%	16.2%	4.8%
113	2768	99.2%	99.0%	99.0%	97.1%	96.2%	93.3%	86.7%	72.4%	45.7%	21.0%	5.7%
110	2670	99.2%	99.0%	99.0%	98.1%	97.1%	96.2%	93.3%	85.7%	66.7%	35.2%	13.3%
108	2604	100.0%	99.0%	99.0%	99.0%	98.1%	97.1%	95.2%	93.3%	75.2%	48.6%	21.0%
105	2520	100.0%	100.0%	99.0%	99.0%	99.0%	98.1%	97.1%	95.2%	90.5%	67.6%	33.3%
103	2463	100.0%	100.0%	100.0%	99.0%	99.0%	99.0%	97.1%	95.2%	93.3%	77.1%	43.8%
96	2357	100.0%	100.0%	100.0%	100.0%	100.0%	99.0%	99.0%	97.1%	95.2%	92.4%	69.5%
91	2250	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	99.0%	98.1%	97.1%	95.2%	87.6%
Average GDU		3544	3477	3407	3330	3242	3142	3032	2912	2777	2627	2468
Maximum GDU		4666	4602	4489	4372	4246	4144	4014	3870	3712	3512	3319
Minimum GDU		2651	2575	2510	2451	2394	2277	2171	2116	2023	1923	1802

Selected Border State Locations

Arapahoe, CO

Historical Probability of Reaching Blacklayer Before a 28° F Freeze - Arapahoe, CO, 1948-2016												
Hybrid		Planting Date										
Relative Maturity	Blacklayer GDU	17-Apr	24-Apr	1-May	8-May	15-May	22-May	29-May	5-Jun	12-Jun	19-Jun	26-Jun
118	2815	92.8%	92.8%	89.9%	85.5%	75.4%	49.3%	29.0%	14.5%	1.4%	1.4%	0.0%
113	2768	94.2%	92.8%	91.3%	88.4%	82.6%	60.9%	39.1%	23.2%	4.3%	1.4%	0.0%
110	2670	100.0%	98.6%	95.7%	91.3%	88.4%	81.2%	62.3%	33.3%	20.3%	1.4%	0.0%
108	2604	100.0%	100.0%	98.6%	95.7%	92.8%	88.4%	79.7%	50.7%	26.1%	4.3%	1.4%
105	2520	100.0%	100.0%	100.0%	100.0%	95.7%	92.8%	87.0%	71.0%	39.1%	21.7%	1.4%
103	2463	100.0%	100.0%	100.0%	100.0%	100.0%	94.2%	91.3%	84.1%	53.6%	27.5%	4.3%
96	2357	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	94.2%	91.3%	82.6%	43.5%	21.7%
91	2250	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	95.7%	89.9%	76.8%	39.1%
Average GDU		3203	3140	3074	3001	2918	2824	2725	2615	2491	2355	2208
Maximum GDU		3787	3730	3653	3533	3395	3303	3227	3095	2949	2817	2655
Minimum GDU		2717	2665	2601	2529	2473	2358	2306	2218	2112	1999	1852

Benkelman, NE

Historical Probability of Reaching Blacklayer Before a 28° F Freeze - Benkelman, NE, 1948-2016												
Hybrid		Planting Date										
Relative Maturity	Blacklayer GDU	17-Apr	24-Apr	1-May	8-May	15-May	22-May	29-May	5-Jun	12-Jun	19-Jun	26-Jun
118	2815	94.2%	87.0%	81.2%	76.8%	65.2%	49.3%	24.6%	10.1%	4.3%	1.4%	0.0%
113	2768	97.1%	95.7%	82.6%	79.7%	72.5%	56.5%	36.2%	17.4%	7.2%	1.4%	0.0%
110	2670	98.6%	98.6%	95.7%	89.9%	79.7%	73.9%	53.6%	31.9%	13.0%	5.8%	1.4%
108	2604	98.6%	98.6%	98.6%	97.1%	89.9%	78.3%	71.0%	44.9%	21.7%	8.7%	1.4%
105	2520	100.0%	100.0%	98.6%	98.6%	95.7%	88.4%	78.3%	63.8%	33.3%	14.5%	4.3%
103	2463	100.0%	100.0%	100.0%	100.0%	98.6%	95.7%	85.5%	75.4%	49.3%	21.7%	8.7%
96	2357	100.0%	100.0%	100.0%	100.0%	100.0%	98.6%	94.2%	87.0%	71.0%	39.1%	15.9%
91	2250	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	94.2%	88.4%	66.7%	29.0%
Average GDU		3171	3110	3046	2973	2892	2797	2698	2587	2460	2323	2175
Maximum GDU		3766	3708	3641	3543	3422	3310	3249	3116	2972	2841	2674
Minimum GDU		2546	2546	2506	2480	2421	2353	2279	2183	2098	1966	1817

Bonny Reservoir, CO

Historical Probability of Reaching Blacklayer Before a 28° F Freeze - Bonny Reservoir, CO, 1949-2012												
Hybrid		Planting Date										
Relative Maturity	Blacklayer GDU	17-Apr	24-Apr	1-May	8-May	15-May	22-May	29-May	5-Jun	12-Jun	19-Jun	26-Jun
118	2815	84.4%	78.1%	67.2%	54.7%	34.4%	21.9%	14.1%	4.7%	1.6%	0.0%	0.0%
113	2768	87.5%	85.9%	78.1%	64.1%	50.0%	29.7%	18.8%	9.4%	3.1%	0.0%	0.0%
110	2670	95.3%	92.2%	89.1%	78.1%	71.9%	48.4%	28.1%	15.6%	9.4%	1.6%	0.0%
108	2604	100.0%	96.9%	90.6%	90.6%	78.1%	70.3%	42.2%	21.9%	10.9%	4.7%	0.0%
105	2520	100.0%	100.0%	98.4%	95.3%	90.6%	76.6%	75.0%	31.3%	18.8%	9.4%	1.6%
103	2463	100.0%	100.0%	100.0%	98.4%	93.8%	87.5%	75.0%	56.3%	26.6%	12.5%	4.7%
96	2357	100.0%	100.0%	100.0%	100.0%	100.0%	95.3%	87.5%	75.0%	53.1%	20.3%	9.4%
91	2250	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	98.4%	90.6%	76.6%	45.3%	17.2%
Average GDU		3030	2974	2916	2849	2773	2685	2593	2492	2374	2247	2107
Maximum GDU		3667	3614	3547	3440	3313	3218	3151	3023	2886	2754	2590
Minimum GDU		2607	2569	2512	2450	2362	2288	2180	2074	1966	1855	1720

Burlington, CO

Historical Probability of Reaching Blacklayer Before a 28° F Freeze - Burlington, CO, 1918-2016												
Hybrid		Planting Date										
Relative Maturity	Blacklayer GDU	17-Apr	24-Apr	1-May	8-May	15-May	22-May	29-May	5-Jun	12-Jun	19-Jun	26-Jun
118	2815	82.8%	78.8%	73.7%	63.6%	51.5%	24.2%	13.1%	8.1%	2.0%	0.0%	0.0%
113	2768	87.9%	83.8%	77.8%	73.7%	58.6%	35.4%	19.2%	10.1%	4.0%	0.0%	0.0%
110	2670	99.0%	93.9%	85.9%	81.8%	74.7%	61.6%	38.4%	16.2%	9.1%	1.0%	0.0%
108	2604	100.0%	100.0%	93.9%	86.9%	80.8%	72.7%	53.5%	26.3%	10.1%	5.1%	1.0%
105	2520	100.0%	100.0%	100.0%	94.9%	88.9%	81.8%	70.7%	47.5%	20.2%	10.1%	1.0%
103	2463	100.0%	100.0%	100.0%	100.0%	93.9%	87.9%	79.8%	61.6%	36.4%	10.1%	4.0%
96	2357	100.0%	100.0%	100.0%	100.0%	100.0%	96.0%	86.9%	81.8%	58.6%	27.3%	10.1%
91	2250	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	98.0%	90.9%	81.8%	54.5%	19.2%
Average GDU		3056	2999	2942	2872	2797	2708	2614	2511	2394	2266	2124
Maximum GDU		3699	3642	3569	3450	3316	3224	3152	3028	2892	2761	2606
Minimum GDU		2652	2619	2566	2502	2406	2283	2193	2113	1994	1916	1804

Cambridge, NE

Historical Probability of Reaching Blacklayer Before a 28° F Freeze - Cambridge, NE, 1948-2016												
Hybrid		Planting Date										
Relative Maturity	Blacklayer GDU	17-Apr	24-Apr	1-May	8-May	15-May	22-May	29-May	5-Jun	12-Jun	19-Jun	26-Jun
118	2815	94.2%	94.2%	89.9%	87.0%	75.4%	53.6%	31.9%	10.1%	2.9%	1.4%	0.0%
113	2768	94.2%	94.2%	94.2%	89.9%	85.5%	62.3%	43.5%	23.2%	4.3%	1.4%	0.0%
110	2670	100.0%	97.1%	95.7%	95.7%	89.9%	82.6%	63.8%	37.7%	13.0%	2.9%	1.4%
108	2604	100.0%	100.0%	98.6%	95.7%	92.8%	88.4%	79.7%	47.8%	23.2%	4.3%	1.4%
105	2520	100.0%	100.0%	100.0%	98.6%	95.7%	92.8%	87.0%	73.9%	43.5%	10.1%	2.9%
103	2463	100.0%	100.0%	100.0%	100.0%	97.1%	95.7%	89.9%	85.5%	52.2%	23.2%	2.9%
96	2357	100.0%	100.0%	100.0%	100.0%	100.0%	98.6%	95.7%	92.8%	82.6%	44.9%	10.1%
91	2250	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	97.1%	95.7%	89.9%	73.9%	36.2%
Average GDU		3209	3149	3083	3009	2924	2827	2725	2609	2478	2336	2184
Maximum GDU		3847	3786	3718	3599	3478	3390	3320	3180	3015	2872	2704
Minimum GDU		2673	2625	2552	2479	2378	2272	2188	2059	1948	1833	1681

Cheyenne Wells, CO

Historical Probability of Reaching Blacklayer Before a 28° F Freeze - Cheyenne Wells, CO, 1918-2016												
Hybrid		Planting Date										
Relative Maturity	Blacklayer GDU	17-Apr	24-Apr	1-May	8-May	15-May	22-May	29-May	5-Jun	12-Jun	19-Jun	26-Jun
118	2815	85.9%	82.8%	80.8%	71.7%	49.5%	32.3%	18.2%	8.1%	4.0%	0.0%	0.0%
113	2768	91.9%	86.9%	83.8%	74.7%	63.6%	39.4%	25.3%	12.1%	7.1%	0.0%	0.0%
110	2670	96.0%	92.9%	90.9%	84.8%	81.8%	66.7%	36.4%	24.2%	9.1%	4.0%	0.0%
108	2604	98.0%	96.0%	92.9%	89.9%	83.8%	76.8%	55.6%	31.3%	15.2%	7.1%	0.0%
105	2520	100.0%	98.0%	96.0%	92.9%	90.9%	82.8%	75.8%	50.5%	28.3%	10.1%	4.0%
103	2463	100.0%	99.0%	99.0%	96.0%	92.9%	86.9%	81.8%	67.7%	36.4%	16.2%	6.1%
96	2357	100.0%	100.0%	100.0%	99.0%	98.0%	94.9%	86.9%	82.8%	62.6%	30.3%	12.1%
91	2250	100.0%	100.0%	100.0%	100.0%	99.0%	99.0%	94.9%	88.9%	81.8%	58.6%	24.2%
Average GDU		3095	3034	2975	2901	2823	2731	2633	2526	2407	2277	2136
Maximum GDU		3686	3600	3518	3399	3340	3241	3128	3016	2872	2726	2550
Minimum GDU		2532	2448	2393	2278	2196	2081	1990	1868	1771	1671	1543

Culbertson, NE

Historical Probability of Reaching Blacklayer Before a 28° F Freeze - Culbertson, NE, 1889-2016												
Hybrid		Planting Date										
Relative Maturity	Blacklayer GDU	17-Apr	24-Apr	1-May	8-May	15-May	22-May	29-May	5-Jun	12-Jun	19-Jun	26-Jun
118	2815	82.8%	74.3%	70.5%	64.8%	54.3%	39.0%	20.0%	15.2%	6.7%	1.9%	1.0%
113	2768	88.3%	78.1%	73.3%	68.6%	63.8%	45.7%	29.5%	18.1%	10.5%	1.9%	1.0%
110	2670	95.3%	92.4%	87.6%	77.1%	70.5%	63.8%	45.7%	25.7%	17.1%	5.7%	1.0%
108	2604	96.1%	94.3%	91.4%	84.8%	76.2%	67.6%	59.0%	37.1%	18.1%	12.4%	1.9%
105	2520	98.4%	96.2%	94.3%	91.4%	84.8%	75.2%	66.7%	50.5%	28.6%	16.2%	4.8%
103	2463	98.4%	98.1%	95.2%	94.3%	90.5%	82.9%	68.6%	62.9%	40.0%	19.0%	11.4%
96	2357	98.4%	98.1%	98.1%	97.1%	94.3%	90.5%	81.9%	70.5%	60.0%	33.3%	17.1%
91	2250	99.2%	98.1%	98.1%	98.1%	97.1%	95.2%	90.5%	83.8%	71.4%	55.2%	22.9%
Average GDU		3130	3071	3008	2937	2855	2762	2659	2548	2426	2289	2140
Maximum GDU		4669	4605	4492	4375	4249	4147	4017	3873	3715	3515	3323
Minimum GDU		2113	2038	1969	1892	1826	1773	1687	1573	1422	1309	1165

Harlan County Lake, NE

Historical Probability of Reaching Blacklayer Before a 28° F Freeze - Harlan County Lake, NE, 1948-2016												
Hybrid		Planting Date										
Relative Maturity	Blacklayer GDU	17-Apr	24-Apr	1-May	8-May	15-May	22-May	29-May	5-Jun	12-Jun	19-Jun	26-Jun
118	2815	94.2%	89.9%	89.9%	82.6%	72.5%	63.8%	39.1%	23.2%	13.0%	0.0%	0.0%
113	2768	95.7%	92.8%	89.9%	88.4%	82.6%	68.1%	55.1%	29.0%	15.9%	4.3%	0.0%
110	2670	95.7%	95.7%	95.7%	89.9%	89.9%	79.7%	71.0%	46.4%	23.2%	11.6%	0.0%
108	2604	97.1%	97.1%	97.1%	95.7%	89.9%	87.0%	76.8%	62.3%	30.4%	18.8%	2.9%
105	2520	100.0%	100.0%	97.1%	97.1%	97.1%	89.9%	87.0%	75.4%	50.7%	23.2%	11.6%
103	2463	100.0%	100.0%	98.6%	98.6%	97.1%	94.2%	89.9%	84.1%	65.2%	29.0%	14.5%
96	2357	100.0%	100.0%	100.0%	100.0%	98.6%	98.6%	92.8%	87.0%	81.2%	55.1%	24.6%
91	2250	100.0%	100.0%	100.0%	100.0%	100.0%	98.6%	97.1%	94.2%	89.9%	79.7%	43.5%
Average GDU		3230	3172	3111	3042	2962	2869	2769	2658	2528	2387	2235
Maximum GDU		3751	3691	3630	3600	3488	3405	3275	3116	2977	2803	2638
Minimum GDU		2546	2524	2455	2383	2304	2212	2122	2017	1931	1812	1710

McCook, NE

Historical Probability of Reaching Blacklayer Before a 28° F Freeze - McCook, NE, 1909-2016												
Hybrid		Planting Date										
Relative Maturity	Blacklayer GDU	17-Apr	24-Apr	1-May	8-May	15-May	22-May	29-May	5-Jun	12-Jun	19-Jun	26-Jun
118	2815	96.3%	92.4%	87.6%	85.7%	75.2%	61.0%	45.7%	21.0%	5.7%	1.9%	1.0%
113	2768	100.0%	94.3%	92.4%	86.7%	82.9%	70.5%	50.5%	26.7%	12.4%	2.9%	1.0%
110	2670	100.0%	100.0%	98.1%	94.3%	87.6%	82.9%	69.5%	51.4%	22.9%	7.6%	1.9%
108	2604	100.0%	100.0%	100.0%	98.1%	93.3%	85.7%	81.0%	61.9%	33.3%	12.4%	1.9%
105	2520	100.0%	100.0%	100.0%	100.0%	98.1%	95.2%	84.8%	78.1%	57.1%	22.9%	7.6%
103	2463	100.0%	100.0%	100.0%	100.0%	99.0%	95.2%	89.5%	83.8%	61.0%	32.4%	10.5%
96	2357	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	95.2%	91.4%	83.8%	57.1%	22.9%
91	2250	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	96.2%	90.5%	79.0%	44.8%
Average GDU		3250	3188	3125	3051	2970	2876	2772	2659	2533	2394	2243
Maximum GDU		4069	4004	3923	3790	3654	3556	3475	3320	3151	3005	2825
Minimum GDU		2775	2689	2615	2564	2438	2394	2305	2179	2084	1971	1838

Trenton Dam, NE

Historical Probability of Reaching Blacklayer Before a 28° F Freeze - Trenton Dam, NE, 1949-2016												
Hybrid		Planting Date										
Relative Maturity	Blacklayer GDU	17-Apr	24-Apr	1-May	8-May	15-May	22-May	29-May	5-Jun	12-Jun	19-Jun	26-Jun
118	2815	95.6%	94.1%	91.2%	80.9%	69.1%	50.0%	30.9%	13.2%	8.8%	1.5%	0.0%
113	2768	95.6%	95.6%	94.1%	89.7%	76.5%	57.4%	38.2%	23.5%	8.8%	1.5%	0.0%
110	2670	97.1%	97.1%	95.6%	94.1%	89.7%	77.9%	58.8%	36.8%	16.2%	4.4%	0.0%
108	2604	100.0%	98.5%	97.1%	95.6%	94.1%	88.2%	70.6%	50.0%	26.5%	11.8%	1.5%
105	2520	100.0%	100.0%	100.0%	98.5%	95.6%	94.1%	88.2%	72.1%	36.8%	16.2%	4.4%
103	2463	100.0%	100.0%	100.0%	100.0%	97.1%	94.1%	91.2%	83.8%	55.9%	27.9%	10.3%
96	2357	100.0%	100.0%	100.0%	100.0%	100.0%	97.1%	95.6%	89.7%	80.9%	45.6%	20.6%
91	2250	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	98.5%	97.1%	89.7%	70.6%	35.3%
Average GDU		3190	3131	3069	2999	2919	2827	2729	2621	2494	2358	2209
Maximum GDU		3746	3689	3628	3519	3400	3311	3250	3118	2965	2835	2665
Minimum GDU		2651	2571	2545	2488	2416	2312	2235	2155	2020	1865	1721

Red Cloud, NE

Historical Probability of Reaching Blacklayer Before a 28° F Freeze - Red Cloud, NE, 1893-2016												
Hybrid		Planting Date										
Relative Maturity	Blacklayer GDU	17-Apr	24-Apr	1-May	8-May	15-May	22-May	29-May	5-Jun	12-Jun	19-Jun	26-Jun
118	2815	98.4%	95.2%	90.5%	83.8%	75.2%	62.9%	46.7%	26.7%	14.3%	5.7%	0.0%
113	2768	99.2%	97.1%	93.3%	90.5%	82.9%	69.5%	53.3%	34.3%	19.0%	6.7%	1.0%
110	2670	100.0%	100.0%	99.0%	97.1%	91.4%	81.9%	67.6%	51.4%	25.7%	14.3%	3.8%
108	2604	100.0%	100.0%	100.0%	99.0%	96.2%	87.6%	77.1%	59.0%	41.9%	18.1%	6.7%
105	2520	100.0%	100.0%	100.0%	100.0%	98.1%	92.4%	85.7%	73.3%	52.4%	28.6%	12.4%
103	2463	100.0%	100.0%	100.0%	100.0%	100.0%	98.1%	90.5%	82.9%	64.8%	39.0%	17.1%
96	2357	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	98.1%	90.5%	80.0%	53.3%	29.5%
91	2250	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	98.1%	89.5%	73.3%	46.7%
Average GDU		3300	3237	3170	3094	3008	2909	2800	2680	2549	2402	2246
Maximum GDU		4065	4009	3916	3792	3658	3530	3463	3309	3136	2981	2807
Minimum GDU		2680	2673	2632	2586	2487	2388	2293	2181	2065	1953	1817

Wray, CO

Historical Probability of Reaching Blacklayer Before a 28° F Freeze - Wray, CO, 1918-2016, less 1954												
Hybrid		Planting Date										
Relative Maturity	Blacklayer GDU	17-Apr	24-Apr	1-May	8-May	15-May	22-May	29-May	5-Jun	12-Jun	19-Jun	26-Jun
118	2815	84.7%	78.6%	69.4%	57.1%	40.8%	19.4%	7.1%	2.0%	1.0%	0.0%	0.0%
113	2768	87.8%	83.7%	77.6%	68.4%	50.0%	33.7%	12.2%	2.0%	1.0%	0.0%	0.0%
110	2670	91.8%	87.8%	85.7%	79.6%	68.4%	46.9%	30.6%	10.2%	2.0%	1.0%	0.0%
108	2604	93.9%	92.9%	87.8%	83.7%	78.6%	63.3%	39.8%	21.4%	7.1%	1.0%	0.0%
105	2520	96.9%	95.9%	94.9%	87.8%	85.7%	75.5%	62.2%	38.8%	11.2%	3.1%	1.0%
103	2463	99.0%	96.9%	96.9%	93.9%	86.7%	83.7%	71.4%	49.0%	27.6%	6.1%	1.0%
96	2357	100.0%	100.0%	99.0%	98.0%	95.9%	88.8%	83.7%	68.4%	45.9%	19.4%	3.1%
91	2250	100.0%	100.0%	100.0%	99.0%	99.0%	98.0%	88.8%	83.7%	70.4%	38.8%	10.2%
Average GDU		3016	2958	2898	2825	2747	2654	2556	2450	2331	2201	2060
Maximum GDU		3667	3628	3572	3451	3322	3231	3153	3016	2877	2752	2587
Minimum GDU		2419	2410	2324	2232	2158	2080	1977	1879	1777	1645	1489

1954 removed from cumulative GDU calculations due to 25° freeze on June 3rd.