Potatoes – *Solanum tuberosum*

Key Cultivars:

Fries (*30%*)

- Umatilla

Chips (*30%*)

- Snowden
- Ring white

Fresh Market (*30%*)

- Red Norland
- Russet Norkotah
- Yukon Gold
- Silverton

Dual Purpose *(fries and fresh)*

- Russet Burbank

Seeds (*10%*)

Climate Risk Notes:

Absolute maximum precipitation is very dependent on soil type. In sandy soils where much of Wisconsin potatoes are currently grown, drainage occurs quickly so it is unlikely that too much precipitation will occur. However, one concern with excessive precipitation is **nitrate leaching caused by fertilizer.** Over-application of nitrogen can result in runoff during high precipitation events, causing significant water contamination and health impacts.

Late blight and early blight are just two examples of diseases that may become more prominent for potatoes in Wisconsin due to changing conditions. Early blight is common in relatively warm temperatures, while late blight is common in cooler temperatures.

	Key Months for Crop Development											
	DEC	**JAN**	**FEB**	**MAR**	**APR**	**MAY**	**JUN**	**JUL**	**AUG**	**SEP**	**OCT**	**NOV**
Stage of growth *(under current conditions)*					Planting [a, f, k]	Planting, Tuber initiation [a, f, k]	Tuber initiation [a, f, k]	Flowering [a, f, k]	Flowering, Harvest [a, f, k]	Harvest [a, f, k]		

Climate									*Soil*						
Min Optimal Temp (°F)	**Max Optimal Temp (°F)**	**Min Absolute Temp (°F)**	**Max Absolute Temp (°F)**	**Germination Soil Temp (°F)**	**Growing Degree Days (40°F base)**	**Chilling Hours (32-45 °F)**	**Min Rainfall (in/week)**	**Max Rainfall (in/week)**	**Min pH**	**Max pH**	**Optimal Soil Texture**	**Absolute Soil Texture**	**Optimal Soil Drainage**	**Absolute Soil Drainage**	**Soil Depth (in)**
55 [b, d, m]	75 [b, d, l, m]	32 [a, h, i, l]	90 [a, b, g]	50-60 [c, f, l, m]	3000 [a, b, e]	NA	1 [c, e, l, m]	2 [c, e, l, m]	5 [c, f, j]	6.5 [c, f, j]	Sand, loamy sand, sandy loam, loam, silt loam, muck [c, f, m]	Sandy clay loam, clay loam, silty clay loam, peat [c, f, m]	Well drained [c, f, m]	Excessively drained, somewhat excessively drained [c, f, m]	12 [c, e, f, l]

References

[a] Bishop, B., & Long, C. (2012, May 30). *New potato maturity and stress graphic tool available on Enviro-weather.* Michigan State University Extension. https://www.canr.msu.edu/news/new_potato_maturity_and_stress_graphic_tool_available_on_enviro-weather

[b] Bishop, B. (2010, September 28). *Potato heat stress tools on Envrio-weather.* Michigan State University Extension. https://www.canr.msu.edu/news/potato_heat_stress_tools_on_enviro_weather

[c] Bradford, B. Z., Colquhoun, J. B., Chapman, S. A., Gevens, A. J., Groves, R. L., Heider, D. J., Nice, G. R. W., Ruark, M. D., & Wang, Y. (2023). *Commercial vegetable production in Wisconsin.* University of Wisconsin-Madison, Extension. https://cdn.shopify.com/s/files/1/0145/8808/4272/files/A3422-2024.pdf

[d] Cao, W., & Tibbitts, T. W. (1994). *Phasic temperature change patterns affect growth and tuberization in potatoes.* Journal of the American Society for Horticultural Science, 119(4): 775-778. https://www.researchgate.net/profile/Theodore-Tibbitts/publication/241949563_Phasic_Temperature_Change_Patterns_Affect_Growth_and_Tuberization_in_Potatoes/links/0046353640b172a4ba000000/Phasic-Temperature-Change-Patterns-Affect-Growth-and-Tuberization-in-Potatoes.pdf

[e] Curwen, D. (n.d.). *Irrigation scheduling for potatoes in Wisconsin.* University of Wisconsin-Madison, Extension. https://vegetables.webhosting.cals.wisc.edu/wp-content/uploads/sites/37/2017/02/Irrigation-Scheduling-for-Potatoes-in-Wisconsin-David-Curwen.pdf

[f] Delahaut, K. A. (2000, September). *Crop profile for potatoes in Wisconsin.* NSF Center for Integrated Pes Management. https://ipmdata.ipmcenters.org/documents/cropprofiles/WIpotatoes.pdf [g] Bradford, B. Z., Colquhoun, J. B., Chapman, S. A., Gevens, A. J., Groves, R. L., Heider, D. J., Nice, G. R. W., Ruark, M. D., & Wang, Y. (2023). *Commercial vegetable production in Wisconsin.* University of Wisconsin-Madison, Extension. https://cdn.shopify.com/s/files/1/0145/8808/4272/files/A3422-2024.pdf

[g] Jones, L. R., Johnson, J., & Dickson, J. G. (1926, November). *Wisconsin studies upon the relation of soil temperature to plant disease.* Agricultural Experiment Station of the University of Wisconsin Madison. https://books.google.com/books?hl=en&lr=&id=TBQnAQAAMAAJ&oi=fnd&pg=PA1&dq=what+temperature+kills+potatos+wisconsin&ots=rthgU680wc&sig=jjNLotCvXk5DtbfVfVtI-WUu3Y4#v=onepage&q&f=false

[h] Li, P. H., Huner, N. P. A., Toivio-Kinnucan, M., Chen, H. H., & Palta, J. P. (1981). *Potatoe freezing injury and survival, and their relationships to other stress.* American Potato Journal, 58: 15-29. https://horticulture.wisc.edu/wp-content/uploads/sites/20/2014/03/potato-freezing-injury-and-survival-and-their-relationship-to-other-stress12.pdf

[i] Phillips, B., & Thompson, C. (2019, October 4). *Identifying and preventing freeze damage in fall vegetables.* Michigan State University Extension. https://www.canr.msu.edu/news/freeze_damage_in_fall_vegetables_identifying_and_preventing

[j] Schuh, M., & Tong, C. (2022). *Growing potatoes in home gardens.* University of Minnesota Extension. https://extension.umn.edu/vegetables/growing-potatoes#:~:text=The%20ideal%20soil%20pH%20level,and%20organic%20matter%20to%20soil

[k] University of Nebraska – Lincoln. (2024). *Early tuber growth.* Institute of Agriculture and Natural Resources – Cropwatch. https://cropwatch.unl.edu/potato/early_tuber_growth

[l] Wang, Y. (2024). *Wisconsin expert review interview.* Interviewed by Katherine Young and Catherine Wollmuth. 17 July, Madison.

[m] Zarka, K. A., Kells, D. C., Douches, D. S., & Buell, C. R. (n.d.). *A guide to growing potatoes in your home garden.* Michigan State University and the Potato Breeding and Genetic Program. https://www.canr.msu.edu/uploads/files/growingpotatoes.pdf