



Climate									Soil						
Min Optimal (Thrive) Temp (°F)	Max Optimal (Thrive) Temp (°F)	Min Absolute (Survive) Temp (°F)	Max Absolute (Survive) Temp (°F)	Germination Soil Temp (°F)	Growing Degree Days (40°F base)	Chilling Hours (32-45 °F)	Min Rainfall (in/year)	Max Rainfall (in/year)	Min pH	Max pH	Optimal (Thrive) Soil Texture	Absolute (Survive) Soil Texture	Optimal (Thrive) Soil Drainage	Absolute (Survive) Soil Drainage	Soil Depth (in)
5 <sup>c, o, p</sup>	90 <sup>g, l, o, q</sup>	-22 <sup>c, o, p</sup>	105 <sup>a, g, l, o</sup>	40-50 <sup>d, g, o, q</sup>	750 - 1200 <sup>e, f, g, l</sup>	NA	15 <sup>b, g, k, n</sup>	80 <sup>b, k, n</sup>	6.3 <sup>g, m, n, o</sup>	7.7 <sup>g, h, m, r</sup>	Sand, sandy loam, loamy sand, sandy clay loam <sup>h, i, n</sup>	Clay, clay loam, silt loam, silty clay loam, silt <sup>h, i, n</sup>	Well drained, somewhat excessively well drained <sup>l, i, o</sup>	Somewhat poorly drained, moderately well drained, excessively well drained <sup>c, n, o</sup>	60 <sup>i, m, n</sup>

## References

- <sup>a</sup> Coblenz, W., & Hoffman, P. (2008). *Heat damaged forages: effects on forage quality*. University of Wisconsin Extension. <https://fyi.extension.wisc.edu/forage/files/2014/01/HeatDamage-FOE.pdf>
- <sup>b</sup> Goplen, J., & Sheaffer, C. (2023). *Alfalfa during drought*. University of Minnesota Extension. <https://extension.umn.edu/growing-forages/alfalfa-during-drought>
- <sup>c</sup> Hesterman, O. B., & Durling, J. C. (1991, August). *Avoiding winter injury to alfalfa*. Michigan State University, Extension Bulletin E-2310. <https://forage.msu.edu/wp-content/uploads/2014/07/E2310-AvoidingWinterInjurytoAlfalfa-HestermanDurling-1991.pdf>
- <sup>d</sup> Isleib, J. (2012, May 4). *Soil temperature, seed germination and the unusual spring of 2012*. Michigan State University Extension. [https://www.canr.msu.edu/news/soil\\_temperature\\_seed\\_germination\\_and\\_the\\_unusual\\_spring\\_of\\_2012](https://www.canr.msu.edu/news/soil_temperature_seed_germination_and_the_unusual_spring_of_2012)
- <sup>e</sup> Jarek, K., Reuss, S. A., & Patton, J. (2021, September 24). *Timing of fall alfalfa harvest can impact long-term viability of the stand*. University of Wisconsin-Madison, Extension. <https://cropsandsoils.extension.wisc.edu/timing-of-fall-alfalfa-harvest-can-impact-long-term-viability-of-the-stand/#:~:text=In%20northern%20Wisconsin%2C%20harvesting%20alfalfa,all%20areas%20of%20the%20state>
- <sup>f</sup> Kaatz, P. (2015, May 19). *Harvest schedule for first cutting alfalfa*. Michigan State University Extension. [https://www.canr.msu.edu/news/harvest\\_schedule\\_for\\_first\\_cutting\\_alfalfa](https://www.canr.msu.edu/news/harvest_schedule_for_first_cutting_alfalfa)
- <sup>g</sup> Kohmann, M. M., & Newell S. (2024). *Wisconsin crop expert interview*. Interviewed by Katherine Young and Catherine Wollmuth. 19 July, Madison.
- <sup>h</sup> Kelling, K. A. (2000). *Alfalfa fertilization*. University of Wisconsin Extension. <https://soilsexextension.qa.webhosting.cals.wisc.edu/wp-content/uploads/sites/68/2014/02/A2448.pdf>
- <sup>i</sup> Nelson, J., & Becker, R. (2000, March). *Crop profile for alfalfa in Minnesota*. NSF Center for Integrated Pest Management. <https://ipmdata.ipmcenters.org/documents/cropprofiles/MNalfalfa.pdf>
- <sup>j</sup> Peters, J. (n.d.) *Is sulfur needed for alfalfa in Wisconsin*. University of Wisconsin-Madison, Extension. <https://cropsandsoils.extension.wisc.edu/articles/is-sulfur-needed-for-alfalfa-in-wisconsin/>
- <sup>k</sup> Rankin, M., & Undersander, D. (2000). *Rain damage to forage during hay and silage making*. University of Wisconsin Extension. <https://fyi.extension.wisc.edu/forage/files/2014/01/Raindam.pdf>
- <sup>l</sup> Sheaffer, C., Drewitz, N., & Goplen, J. (2022, May 16). *Managing risk at the first alfalfa harvest*. University of Minnesota Extension. <https://blog-crop-news.extension.umn.edu/2022/05/managing-risk-at-first-alfalfa-harvest.html>
- <sup>m</sup> Sheaffer, C., Wells, M. S., & Holen, D. (2023). *Alfalfa establishment: management strategies*. University of Minnesota Extension. <https://extension.umn.edu/planting-forages/alfalfa-establishment-management-strategies>
- <sup>n</sup> Undersander, D., Cosgrove, D., Cullen, E., Grau, C., Rice, M. E., Renz, M., Sheaffer, C., Shewmaker, G., & Sulc, M. (2011). *Alfalfa management guide*. American Society of Agronomy. <https://www.agronomy.org/files/publications/alfalfa-management-guide.pdf>
- <sup>o</sup> Undersander, D., Hall, M. H., Vassalotti, P., & Cosgrove, D. (2011). *Alfalfa germination and growth*. University of Wisconsin Extension. [https://www.alfalfa.org/pdf/Alf\\_GerminationGrowth.pdf](https://www.alfalfa.org/pdf/Alf_GerminationGrowth.pdf)
- <sup>p</sup> Undersander, D. (2014, January 9). *The cold temperatures and alfalfa*. University of Wisconsin-Madison, Intergrated Pest and Crop Management. <https://ipcm.wisc.edu/blog/2014/01/the-cold-temperatures-and-alfalfa/>
- <sup>q</sup> Undersander, D. (2012) *Alfalfa grass mixtures*. Wisconsin Crop Management Conference. [https://fyi.extension.wisc.edu/forage/files/2016/11/Undersander\\_2-2.pdf](https://fyi.extension.wisc.edu/forage/files/2016/11/Undersander_2-2.pdf)
- <sup>r</sup> Undersander, D. (2001). *Alfalfa yield and stand*. University of Wisconsin Extension. <https://fyi.extension.wisc.edu/forage/files/2017/04/Alfalfa-Yield-and-Stand-1.pdf>
- <sup>s</sup> Undersander, D. (n.d.). *Frosted alfalfa*. University of Wisconsin Extension. <https://fyi.extension.wisc.edu/forage/files/2017/01/Frosted-Alfalfa.pdf>
- <sup>t</sup> University of Wisconsin-Madison. (2023). *Wisconsin alfalfa yield and persistence (WAYP) program 2023 summary report*. Team Forage. <https://arlington.ars.wisc.edu/wp-content/uploads/sites/115/2024/03/2023-WAYP-Summary.pdf>