

Publications

Günter Hoch

Last update: 12. 1. 2021

90. Chiang C, Bånkestad D, **Hoch G** (2020) Reaching natural growth: the significance of light and temperature fluctuations in plant performance in indoor growth facilities. *Plants* 9, 1312, doi:10.33390/plants9101312
89. Chiang C, Bånkestad D, **Hoch G** (2020) Reaching natural growth: light quality effects on plant performance in indoor growth facilities. *Plants* 9, 1273. doi: 10.33390/plants9101273
88. Collalti A, Tjoelker MG, **Hoch G**, Mäkelä A, Guidolotti G, Heskell M, Petit G, Ryan MG, Battipaglia G, Matteucci G, Prentice IC (2020) Plant respiration: Controlled by photosynthesis or biomass? *Global Change Biology* 26: 1739-1753
87. Halbritter A. et al. [**Hoch G**] (2020) The handbook for standardized field and laboratory measurements in terrestrial climate change experiments and observational studies (ClimEx). *Methods in Ecology and Evolution* 11: 22-37
86. Joseph J, Gao D, Backes B, Bloch C, Brunner I, Gleixner G, Haeni M, Hartmann H, **Hoch G**, Hug C, Kahmen A, Lehmann MM, Luster J, Peter M, Poll C, Rigling A, Rissanen KA, Ruehr N, Saurer M, Schaub M, Schönbeck L, Stern B, Thomas FM, Werner RA; Werner W, Wohlgemuth T, Hagedorn F, Gessler A (2020) Rhizosphere activity in an old-growth forest reacts rapidly to changes in soil moisture and shapes whole-tree carbon allocation. *PNAS* (in press)
85. Schuldt B, Buras A, Arend M, Vitasse Y, Beierkuhnlein C, Damm A, Gharun M, Grams TEE, Hauck M, Hajek P, Jartmann H, Hiltbrunner E, **Hoch G**, Holloway-Phillips M, Körner C, Larysch E, Lübke T, Nelson DB, Rammig A, Rigling A, Rose L, Ruehr NK, Schumann K, Weiser F, Werner C, Wohlgemuth T, Zang CS, Kahmen A (2020) A first assessment of the impact of the extreme 2018 summer drought on Central European forests. *Basic and Applied Ecology* 45: 186-103
84. Schönbeck L, Li M, Lehmann MM, Rigling A, Schaub M, **Hoch G**, Kahmen A, Gessler A (2020) *Soil nutrient availability alters tree carbon allocation dynamics during drought*. *Tree Physiology*. doi: 10.1093/treephys/tpaa139
83. Schönbeck L, Gessler A, Schaub M, Rigling A, **Hoch G**, Kahmen A, Li M (2020) Soil nutrients and lowered source:sink ratio mitigate effects of mild but not of extreme drought in trees. *Environmental and Experimental Botany* 169: 103905, doi:10.1016/j.envexpbot.2019.103905
82. Wohlgemuth L, Osterwald S, Joseph C, Kahmen A, **Hoch G**, Alewell C, Jiskra M (2020) A bottom-up quantification of foliar mercury uptake fluxes across Europe. *Biogeosciences* 17: 6441-6456
81. Chiang C, Olsen JE, Basler D, Bånkestad D, **Hoch G** (2019) Latitude and weather influences on sun light quality and the relationship to tree growth. *Forests* 107: 610; doi:10.33390/f10080610
80. **Hoch G** (2019) Zwischen Nebelmeer und Trockenwüste: Die Kiefernwälder der Kanaren. *Schweizerische Beiträge zur Dendrologie* 69-70: 89-95
79. Dietrich L, Delzon S, **Hoch G**, Kahmen A (2019) No role for xylem embolism or carbohydrate shortage in temperate trees during the severe 2015 drought. *Journal of Ecology* 107: 334-349
78. Piper F, **Hoch G**, Fajardo A (2019) Revisiting the relative growth rate hypothesis for gymnosperm and angiosperm species co-occurrence. *American Journal of Botany* 106: 101-102

77. Weber R, Gessler A, **Hoch G** (2019) High carbon storage in carbon limited trees. *New Phytologist* 222: 171-182
76. Bachofen C, Moser B, **Hoch G**, Ghazoul J, Wohlgemuth T (2018) No carbon ‘bet hedging’ under prolonged summer drought and elevated CO₂. *Journal of Ecology* 106: 31-46
75. Dietrich L, **Hoch G**, Kahmen A, Körner C (2018) Losing half the conductive area hardly impacts the water status of mature trees. *Scientific Reports* 8: 15006. doi: 10.1038/s41598-018-33465-0
74. Hartmann H, Adams HD, Hammond WM, **Hoch G**, Landhäusser S, Wiley E, Zaehle S (2018) Identifying differences in carbohydrate dynamics of seedlings and mature trees to improve carbon allocation in models for trees and forests. *Environmental and Experimental Botany* 152: 7-8
73. Landhäusser SM, Chow PS, Dickman LT, Furze M, Kuhlman I, Schmid S, Wiesenbauer J, Wild B, Gleixner G, Hartmann H, **Hoch G**, McDowell NG, Richardson AD, Richter A, Adams HD (2018) Standardized protocols and procedures can precisely and accurately quantify non-structural carbohydrates. *Tree Physiology* 38: 1764-1778
72. Paudel I, Halpern M, Wagner Y, Raveh E, Yermiyahu U, **Hoch G**, Klein T (2018) Elevated CO₂ compensates for drought effects in lemon saplings via stomatal downregulation, increased soil moisture, and increased wood carbon storage. *Environmental and Experimental Botany* 148: 117-127
71. Schönbeck L, Gessler A, **Hoch G**, McDowell NG, Rigling A, Schaub M, Li, MH (2018) Homeostatic levels of nonstructural carbohydrates after 13 yr of drought and irrigation in *Pinus sylvestris*. *New Phytologist* 219: 1314-1324
70. Wang W, Wang Y, **Hoch G**, Wang Z, Gu J (2018) Linkage of root morphology to anatomy with increasing nitrogen availability in six temperate tree species. *Plant and Soil* 425: 189-200
68. Weber R, Schwendener A, Schmid S, Lambert S, Wiley E, Landhäusser S, Hartmann H, **Hoch G** (2018) Living next to nothing: Tree seedlings can survive weeks with very low carbohydrate concentrations. *New Phytologist* 218: 107-118
67. García-Plazaola JI, Fernandez-Marin B, Ferrio JP, Alday JG, **Hoch G**, Landais D, Milcu A, Tissue DT, Voltas J, Gessler A, Roy J, Resco de Dios V (2017) Endogenous circadian rhythms in pigment composition induce changes in photochemical efficiency in plant canopies. *Plant Cell and Environment* 40: 1153-1162
66. Gessler A, Roy J, Kayler Z, Ferrio JP, Alday JG, Bahn M, del Castillo J, Devidal S, García-Muñoz S, Landais D, Martín-Gomez P, Milcu A, Piel C, Pirhofer-Walzl K, Galiano L, Schaub M, Haeni M, Ravel O, Salekin S, Tissue DT, Tjoelker MG, Voltas J, **Hoch G**, Resco de Dios V (2017) Night and day – Circadian regulation of night-time dark respiration and light-enhanced dark respiration in plant leaves and canopies. *Environmental and Experimental Botany* 137:14-25
65. Piper FI, Fajardo A, **Hoch G** (2017) Single-provenance mature conifers show higher non-structural carbohydrate storage and reduced growth in a drier location. *Tree Physiology* 37: 1001-1010
64. Schmid S, Palacio S, **Hoch G** (2017) Growth reduction after defoliation is independent of CO₂ supply in deciduous and evergreen young oaks. *New Phytologist* 214: 1153-1162

63. Wiley E, **Hoch G**, Lanhäuser S (2017) Dying piece by piece: carbohydrate dynamics in aspen (*Populus tremuloides*) seedlings under severe carbon stress. *Journal of Experimental Botany* 68: 5221-5232
62. Klein T, Vitasse Y, **Hoch G** (2016) Coordination between growth, phenology, and carbon storage in three coexisting deciduous tree species in a temperate forest. *Tree Physiology* 36: 847-855
61. Körner C, Basler D, **Hoch G**, Kollas C, Lenz A, Randin C, Vitasse Y, Zimmermann NE (2016) Where, why and how? Explaining the low temperature range limits of temperate tree species. *Journal of Ecology* 104: 1076-1088
60. Lenz A, **Hoch G**, Vitasse Y (2016) Fast acclimation of freezing resistance suggests no influence of winter minimum temperature on the range limit of European beech. *Tree Physiology* 36: 490-501
59. Lenz A, **Hoch G**, Körner C, Vitasse Y (2016) Convergence of leaf-out towards minimum risk of freezing damage in temperate trees. *Functional Ecology*. doi: 10.1111/1365-2435.12623
58. Martínez-Vilalta J, Sala A, Asensio D, Galiano L, **Hoch G**, Palacio S, Piper FI, Lloret F (2016) Dynamics of non-structural carbohydrates in terrestrial plants: a global synthesis. *Ecological Monographs* 86: 495-516
57. Plavcova L, **Hoch G**, Morris H, Ghiasi S, Jansen S (2016) the amount of parenchyma and living fibers affects storage of non-structural carbohydrates in young stems and roots of temperate trees. *American Journal of Botany* 103: 603-612
56. Sedlacek J, Cortés AJ, Wheeler J, Bossdorf O, **Hoch G**, Klápště J, Lexer C, Rixen C, Wipf S, Karrenberg S, van Kleunen M (2016) Evolutionary potential in the Alpine: trait heritabilities and performance variation of the dwarf willow *Salix herbacea* from different elevations and microhabitats. *Ecology and Evolution*. doi: 10.1002/ece3.2171
55. Wheeler JA, Cortés AJ, Sedlacek J, Karrenberg S, van Kleunen M, Wipf S, **Hoch G**, Bossdorf O, Rixen C (2016) The snow and the willows: Earlier spring snowmelt reduces performance in the low-lying alpine shrub *Salix herbacea*. *Journal of Ecology*. doi: 10.1111/1365-2745.12579
54. **Hoch G** (2015) Carbon reserves as indicators for carbon limitation in trees. *Progress in Botany* 76: 321-346
53. Klein T, **Hoch G** (2015) Tree carbon allocation dynamics determined using a carbon mass balance approach. *New Phytologist* 205: 147-159
52. Palacio S, Lenz A, Wipf S, **Hoch G**, Rixen C (2015) Bud freezing resistance in alpine shrubs across snow depth gradients. *Environmental and Experimental Botany*. 118: 95-101
51. Puri E, **Hoch G**, Körner C (2015) Defoliation reduces growth but not carbon reserves in Mediterranean *Pinus pinaster* trees. *Trees - Structure and Function* 29: 1187-1196
50. Quentin AG, et al. [**Hoch G**] (2015) Non-structural carbohydrates in woody plants compared among laboratories. *Tree Physiology* 35: 1146-1165
49. Ramirez JA, Posada JM, Handa IT, **Hoch G**, Vohland M, Messier C, Reu B (2015) Near-infrared spectroscopy (NIRS) predicts non-structural carbohydrate concentrations in different tissue types of a broad range of tree species. *Methods in Ecology and Evolution* 6:1018-1025

48. Sedlacek J, Wheeler JA, Cortés AJ, Bossdorf O, **Hoch G**, Lexer C, Wipf S, Karrenberg S, van Kleuen M, Rixen C (2015) The response of the alpine dwarf shrub *Salix herbacea* to altered snowmelt timing: lessons from a multi-site transplant experiment. PLoS ONE 10: article number: UNSP e0122395
47. Wheeler JA, Schnider F, Sedlacek J, Cortés AJ, Wipf S, **Hoch G**, Rixen C (2015) With a little help from my friends: community facilitation increases performance in the dwarf shrub *Salix herbacea*. Basic and Applied Ecology 16: 202-209
46. Cortés AJ, Waeber S, Lexer C, Sedlacek J, Wheeler JA, van Kleuen M, Bossdorf O, **Hoch G**, Rixen C, Wipf S, Karrenberg S (2014) Small-scale patterns in snowmelt timing affect genetic diversity and gene flow in the alpine dwarf shrub *Salix herbacea*. Heredity 113: 233-239
45. Klein T, **Hoch G**, Yakir D, Körner C (2014) Drought stress, growth, and nonstructural carbohydrate dynamics of pine trees in a semi-arid forest. Tree Physiology 34: 981-992
44. Lenz A, Vitasse Y, **Hoch G**, Körner C (2014) Growth and carbon relations of temperate deciduous tree species at their upper elevation range limit. Journal of Ecology 102: 1537-1548
43. Rehm EM, Lenz A, **Hoch G**, Körner C (2014) Spring patterns of freezing resistance and photosynthesis of two leaf phenotypes of *Hedera helix*. Basic and Applied Ecology 15: 543-550
42. Vitasse Y, Lenz A, **Hoch G**, Körner C (2014) Earlier leaf-out rather than difference in freezing resistance puts juvenile trees at greater risk of damage than adult trees. Journal of Ecology 104: 981-988
41. Vitasse Y, Lenz A, Kollas C, Randin CF, **Hoch G**, Körner C (2014) Genetic vs. non-genetic responses of leaf morphology and growth to elevation in temperate tree species. Functional Ecology 28: 243-252
40. Palacio S, **Hoch G**, Anna Sala, Körner C, Millard P (2014) Does carbon storage limit tree growth? New Phytologist 201: 1096-1100
39. Wheeler JA, **Hoch G**, Cortés AJ, Sedlacek J, Wipf S, Rixen C (2014) Increased spring freezing vulnerability for alpine shrubs under early snowmelt. Oecologia 175: 219-229
38. Schenker G, Lenz A, Körner C, **Hoch G** (2014) Physiological minimum temperatures for root growth in seven common European broad-leaved tree species. Tree Physiology 34: 302-313
37. **Hoch G** (2013) Reciprocal root-shoot cooling and soil fertilization effects on the seasonal growth of two treeline conifer species. Plant Ecology and Diversity 6: 7 -20
36. **Hoch G**, Siegwolf RTW, Keel SG, Körner C, Han Q (2013) Fruit production in three masting tree species does not rely on stored carbon reserves. Oecologia 171: 653-662
35. Fajardo A, Piper FI, **Hoch G** (2013) Similar variation in carbon storage between deciduous and evergreen treeline species across elevational gradients. Annals of Botany 112: 623-631
34. Lenz A, **Hoch G**, Körner C. (2013) Early season temperature controls cambial activity and total tree ring width at the alpine treeline. Plant Ecology and Diversity 6: 365-375
33. Lenz A, **Hoch G**, Vitasse Y, Körner C (2013) European deciduous trees exhibit similar safety margins against damage by spring freeze events along elevational gradients. New Phytologist 200: 1166-1175

32. Streit K, Rinne K, Hagedorn F, Dawes M, Saurer M, **Hoch G**, Werner R, Buchmann N, Siegwolf RTW (2013) Tracing carbon allocation in *Larix decidua* exposed to elevated CO₂ and soil warming at the alpine treeline using compound-specific stable isotope analysis. *New Phytologist* 197: 838-849
31. Vitasse Y, **Hoch G**, Randin CF, Scheepens JF, Kollas C, Lenz A, Körner C (2013) Elevational adaptation and plasticity of leaf unfolding and bud set timings of seedlings in major temperate tree species in the Swiss Alps. *Oecologia* 171: 663-678
30. **Hoch G**, Körner C (2012) Global patterns of mobile carbon stores in trees at the high-elevation tree line. *Global Ecology and Biogeography* 21: 861-871
29. Fajardo A, Piper FI, Pfund L, Körner C, **Hoch G** (2012) Variation of mobile carbon reserves in trees at the alpine treeline ecotone is under environmental control. *New Phytologist* 195:794-802
28. Vitasse Y, **Hoch G**, Randin CF, Lenz A, Kollas C, Körner C (2012) Tree recruitment of European tree species at their current upper elevational limits in the Swiss Alps. *Journal of Biogeography* 39: 1439-1449
27. Kollas C, Vitasse Y, Randin CF, **Hoch G**, Körner C (2012) Unrestricted quality of seeds in European broad-leaved tree species growing at the cold boundary of their distribution. *Annals of Botany* 109: 473-480
26. Han Q, Kabeya D, Körner C, **Hoch G** (2011) Leaf traits, shoot growth and seed production in mature *Fagus sylvatica* trees after eight years' CO₂ enrichment. *Annals of Botany* 107:1405-1411
25. Sala A, Foutus W, **Hoch G** (2011) Carbon storage in trees: does relative carbon supply decrease with tree size? In FC Meinzer, T Dawson, B Ladenbruch (eds.) *Size- and Age-Related Changes in Tree Structure and Function*. Springer Verlag, Heidelberg, pp 287-308
24. Sala A, Piper FI, **Hoch G** (2010) Physiological mechanisms of drought-induced tree mortality are far from being resolved. *New Phytologist* 186: 274-281
23. Schädel CM, Richter A, Blöchl A, **Hoch G** (2010) Hemicelluloses concentration and composition in plant cell walls under extreme carbon source-sink imbalances. *Physiologia Plantarum* 139: 241-255
22. Schädel CM, Blöchl A, Richter A, **Hoch G** (2010) Quantification and monosaccharide composition of hemicelluloses from different functional plant types. *Plant Physiology and Biochemistry* 48: 1-8
21. **Hoch G**, Körner C (2009) Growth and carbon relations of treeline forming conifers at constant vs. variable low temperatures. *Journal of Ecology* 97: 57-66
20. Sala A, **Hoch G** (2009) Height-related growth declines in ponderosa pine are not due to carbon limitation. *Plant, Cell and Environment* 32: 22-30
19. Schädel CM, Blöchl A, Richter A, **Hoch G**. (2009) Short-term dynamics of non-structural carbohydrates and hemicelluloses in young branches of temperate forest trees during bud break. *Tree Physiology* 29: 901-911

18. **Hoch G** (2008) The carbon supply of *Picea abies* trees at a Swiss montane permafrost site. *Plant Ecology and Diversity* 1: 13-20
17. Shi P, Körner C, **Hoch G** (2008) A test of the growth-limitation theory for alpine treeline formation in evergreen and deciduous taxa of the Eastern Himalayas. *Functional Ecology* 22: 213-220
16. **Hoch G** (2007) Cell wall hemicelluloses as mobile carbon stores in non-reproductive plant tissues. *Functional Ecology* 21: 823-834
15. **Hoch G** (2007) Zellwände und ihre Bausteine. *UNINOVA* 107: 8 - 10
14. **Hoch G**, Keel SG (2006) ¹³C labelling reveals different contributions of photoassimilates from infructescences for fruiting in two temperate forest tree species. *Plant Biology* 8: 606-614
13. Körner C, **Hoch G** (2006) A test of treeline theory on a montane permafrost island. *Arctic Antarctic and Alpine Research* 38: 113-119
12. Shi P, Körner C, **Hoch G** (2006) End of season carbon supply status of woody species near the treeline in western China. *Basic and Applied Ecology* 7: 370-377
11. **Hoch G** (2005) Fruit-bearing branchlets are carbon autonomous in mature broad-leaved temperate forest trees. *Plant, Cell and Environment* 28: 651-659
10. **Hoch G**, Körner C (2005) Growth, demography and carbon relations of *Polylepis* trees at the world's highest treeline. *Functional Ecology* 19: 941-951
9. Körner C, **Hoch G** (2005) Grenzen ausloten. *UNINOVA* 100: 15 - 17
8. **Hoch G**, Körner C (2003) The carbon charging of pines at the climatic treeline: a global comparison. *Oecologia* 135: 10-21
7. **Hoch G**, Richter A, Körner C (2003) Non-structural carbon compounds in temperate forest trees. *Plant, Cell and Environment* 26: 1067-1081
6. Arndt SK, Wanek W, **Hoch G**, Richter A, Popp M (2002) Flexibility of nitrogen metabolism in the tropical C₃-crassulacean acid metabolism tree species *Clusia minor*. *Functional Plant Biology* 29: 741-747
5. **Hoch G**, Popp M, Körner C (2002) Altitudinal increase of mobile carbon pools in *Pinus cembra* suggests sink limitation of growth at the Swiss treeline. *Oikos* 98: 361-374
4. Li MH, **Hoch G**, Körner C (2002) Source/sink removal affects mobile carbohydrates in *Pinus cembra* at the Swiss treeline. *Trees - Structure and Function* 16: 331-337
3. Li MH, **Hoch G**, Körner C (2001) Spatial variability of mobile carbohydrates within *Pinus cembra* trees at the alpine treeline. *Phyton-Annales Rei Botanicae* 41: 203-213
2. Richter A, **Hoch G**, Puschenreiter M, Mayer U, Peterbauer T (2000) The role of stachyose synthase in the oligosaccharide metabolism of legume seeds. In: Black M, Bradford KJ, Vazquez-Ramos J (eds) *Seed Biology: Advances and Applications*. CAB International, pp 75-84
1. **Hoch G**, Peterbauer T, Richter A (1999) Purification and characterization of stachyose synthase from lentil (*Lens culinaris*) seeds: Galactopinitol and stachyose synthesis. *Archives of Biochemistry and Biophysics* 366: 75-81