

REFERENCE

- Adams, M.A. and J.S. Pate. 1992. Availability of organic and inorganic forms of phosphorus to lupin (*Lupinus* spp.). *Plant Soil* 145:107-114.
- Ahmed, A., S. Aftab, S. Hussain, H.N. Cheema, W. Liu, F. Yang, W. Yang. 2020. Nutrient accumulation and distribution assessment in response to potassium application under maize-soybean intercropping system. *Agronomy* 10, 725.
- Akbas F., H. Gunal, N. Acir. 2017. Spatial variability of soil potassium and its relationship to land use and parent material. *Soil & Water Res.* 12: 202–211.
- Auge, K.D., T.K. Assefa, W.H. Woldeyohannes, and B. T. Asfaw. 2018. Potassium dynamics under enset (*Ensete ventricosom* cheesman) farming systems of Sidama zone, Southern Ethiopia. *Journal of Soil Science and Environmental Management* 9:47-58.
- Azizah, F. N. 2017. Identification of low and high potassium tolerance of soybean cultivar and detection of metabolite in rhizosphere soil of soybean under different potassium conditions (Unpublished undergraduate thesis). Yamagata University, Japan.
- Azo, W.M., G.P.F. Lane, W.P. Davies, and N.D. Cannon. 2012. Bi-cropping white lupins (*Lupinus albus* L.) with cereals for wholecrop forage in organic farming: The effect of seed rate and harvest dates on crop yield and quality. *Biological Agriculture & Horticulture* 28:86-100.
- Baligar, V.C. 1985. Potassium uptake by plants, as characterized by root density, species and K/Rb ratio. *Plant and Soil* 85:43-53.
- Bhardwaj, H.L. and A.A. Hamama. 2012. Cultivar and growing location effects on white lupin immature green seeds. *Journal of Agricultural Science* 4: 135-138.
- Bhardwaj, H.L., A.A. Hamama, & L.C. Merrick. 1998. Genotypic and environmental effects on lupin seed composition. *Plant Foods for Human Nutrition* 53:1-13.

- Bieleski, R. and P.N. Johnson. 1973. The external location of phosphatase activity in phosphorus-deficient *Spirodela oligorrhiza*. *Australian Journal of Biological Science* 25: 707-720.
- Canarini A, C. Kaiser, A. Merchant, A. Richter, and W. Wanek. 2019. Root Exudation of Primary Metabolites: Mechanisms and Their Roles in Plant Responses to Environmental Stimuli. *Frontiers in Plant Science*. 10:157.
- Clark, S. 2014. Plant Guide for White Lupine (*Lupinus albus* L.). USDA-Natural Resources Conservation Service, Big Flats Plant Materials Center. Corning, New York.
- Cui, J., C. Abadie, A. Carroll, E. Lamade, G. Tcherkez. 2018. Responses to K deficiency and waterlogging interact via respiratory and nitrogen metabolism. *Plant, cell, and Environment* 42 :647-658.
- Diem, B. and D.L. Godbold. 1993. Potassium, calcium and magnesium antagonism in clones of *Populus trichocarpa*. *Plant Soil* 155: 411-414
- Ding, W., P.L. Clode, H. Lambers. 2018. Effect of pH and bicarbonate on the nutrient status and growth of three lupinus species. *Plant Soil* 447: 9-28.
- Eastwood, R.J., C.S. Drummond, M.T. Schifino-Wittmann, and C.E. Hughes. 2008. Diversity and evolutionary history of lupins - Insights from new phylogenies. J.A.Palta and J.B. Berger (eds) "Lupins for Health and Wealth" Proceedings of the 12th International Lupin Conference 14-18 Sep 2008 Fremantle Western Australia.
- Egle, K., W. Romer, H. Keller. 2003. Exudation of low molecular weight organic acids by *Lupinus albus* L., *Lupinus angustifolius* L. and *Lupinus luteus* L. as affected by phosphorus supply. *Agronomie* 23:511-518.
- Evans, H. J. and G. J. Sorger. 1966. Role of mineral elements with emphasis on the univalent cations. *Annual Review of Plant Physiology*. 17: 47-76.

- Fischer, R. A. 1971. Role of potassium in stomatal opening in the leaf of *Vicia faba*. *Plant Physiol.* 47: 555-558.
- Funayama-Noguchi, S., K. Noguchi, and I. Terashima. 2015. Comparison of the responses to phosphorus deficiency in two lupine species, *Lupinus albus* and *L. angustifolius*, with contrasting root morphology. *Plant, Cell and Environment* 38:399-410.
- Gierth M, R. Stelzer, and H. Lehmann. 1998. An analytical microscopical study on the role of the exodermis in apoplastic Rb^+ (K^+) transport in barley roots. *Plant and Soil* 207:209-218.
- Hafsi, C., A. Atia, A. Lakhdar, A. Debez, and C. Abdelly. 2011. Differential responses in potassium absorption and use efficiencies in the halophytes *Catapodium rigidum* and *Hordeum maritimum* to various potassium concentrations in the medium. *Plant Production Science* 14: 135-140.
- Hafsi, C., A. Debez, C. Abdelly. 2014. Potassium deficiency in plants: effects and signaling cascades. *Acta Physiol Plant* 36:1055–1070.
- Hu, W., T.D. Coomer, D.A. Loka, D.M. Oosterhuis, Z. Zhou. 2017. Potassium deficiency affect the carbon-nitrogen balance in cotton leaves. *Plant Physiology and Biochemistry* 115: 408-417.
- Humble, G. D. and T. C. Hsiao. 1970. Light-dependent influx and efflux of potassium of guard cells during stomatal opening and closing. *Plant Physiology.* 46: 483-487.
- Integrated Taxonomic Information System (ITIS) on-line database. *Lupinus* L. https://www.itis.gov/servlet/SingleRpt/SingleRpt?search_topic=TSN&search_value=25916#null. Retrieved on August 5, 2020.
- Jalali, M. and Z. V. Khanlari. 2014. Kinetics of potassium release from calcareous soils under different land use. *Arid Land Research and Management* 28: 1-13.

- Johnson, N.D., B. Liu, and B.L. Bentley. 1987. The effects of nitrogen fixation, soil nitrate, and defoliation on the growth, alkaloids, and nitrogen levels of *Lupinus succulentus* (Fabaceae). *Oecologia* 74: 425-431.
- Johnson, N.D., L.P. Rigney, and B.L. Bentley. 1989. Short-Term induction of alkaloid production in lupines differences between N₂-fixing and nitrogen-limited plants. *Journal of Chemical Ecology* 15:2425-2434.
- Kayser M., M. Benke, J. Isselstein. 2012. Potassium leaching following silage maize on a productive sandy soil. *Plant, Soil and Environment* 58: 545–550.
- Korb, N. 2002. Potassium cycling, testing, and fertilizer recommendation. *Nutrient Management* 1-12.
- Leigh, R.A., Wyn-Jones, R.G. 1984. A hypothesis relating critical potassium concentrations for growth to the distribution and functions of this ion in the plant cell. *New Phytologist* 97:1–13.
- Liang, R. and C. Li. 2003. Differences in cluster-root formation and carboxylate exudation in *Lupinus albus* L. under different nutrient deficiencies. *Plant and Soil* 248: 221-227.
- Liu, J., T. Hu, P. Feng, L. Wang, S. Yang. 2019. Tomato yield and water use efficiency change with various soil moisture and potassium levels during different growth stages. *PLoS ONE* 14: 1-14.
- Maia, J.T.L.S., H.E.P. Martinez, P.R. Cecon, C.D.C. Milagres, and J.M. Clemente. 2019. Effect of potassium on the cherry tomato growth and nutrition in hydroponic system. *Bioscience Journal* 35: 849-858.
- Marschner, H. 2006. *Mineral Nutrition of Higher Plants* Second edition. Academic Press, Amsterdam.
- Maser, P., M. Gierth, and J. I. Schroeder. 2002. Molecular mechanisms of potassium and sodium uptake in plants. *Plant and Soil* 247:43-54.

- Mommer, L., J.Kirkegaard, and J. van Ruijven. 2016. Root-root interactions: Towards a rhizosphere framework. *Trends in Plant Science* 21: 209-217.
- Nieves-Cordones, M., R. Rodenas, A. Lara, V. Martinez, and F. Rubio. 2019. The combination of K⁺ deficiency with other environmental stresses: what is outcome?. *Physiologia Plantarum* 165:264-276.
- Office of The Gene Technology Regulator. 2013. The Biology of *Lupinus* L. (lupin or lupine).[http://www.ogtr.gov.au/internet/ogtr/publishing.nsf/Content/biologylupin2013-toc/\\$FILE/biologylupin2013-2.pdf](http://www.ogtr.gov.au/internet/ogtr/publishing.nsf/Content/biologylupin2013-toc/$FILE/biologylupin2013-2.pdf). Retrieved on August 5, 2020.
- Oikawa, A., N. Fujita, R. Horie, K. Saito, K. Tawaraya. 2011. Solid-phases extraction for metabolomics analysis of high-salinity samples by capillary electrophoresis-mass spectrometry. *Journal of Separation Science* 34:1063-1068.
- Pujos, A. and P. Morard. 1997. Effects of potassium deficiency on tomato growth and mineral nutrition at the early production stage. *Plant Soil* 189: 189-196.
- Reuter, D.J. and J.B. Robinson. 1997. *Plant analysis: An Interpretation manual* 2nd edition. CSIRO, Australia.
- Ruan, L., J. Zhang, X. Xin, C. Zhang, D. Ma, L. Chen, and B. Zhao. 2015. Comparative analysis of potassium deficiency-responsive transcriptomes in low potassium susceptible and tolerant wheat (*Triticum aestivum* L.). *Scientific Report* 5: 1-13.
- Sasse, J., E. Martinoia, and T. Northen. 2018. Feed your friends: do plant exudates shape the root microbiome?. *Trends in Plant Science* 23: 25–41.
- Schachtman, D.P. and R. Shin. 2007. Nutrient sensing and signaling: NPKS. *The Annual Review of Plant Biology* 58:47–69.
- Song, W., R. Xue, Y. Song, Y. Bi, Z. Liang, L. Meng, C. Dong, C. Wang, G. Liu, J. Dong, Y. Zhang. 2018. Differential response of first-order lateral root elongation to low

potassium involves nitric oxide in two tobacco cultivars. *Journal Plant Growth Regulation* 37:114–127.

Spencer, D. and J. V. Possingham. 1960. The effect of nutrient deficiencies on the Hill reaction of isolated chloroplasts from tomato. *Australian Journal of Biological Science* 13: 441-455.

Tailliez, A., S.Pierrisnard, V. Camilleri, C. Keller, P. Henner. 2013. Do rhizospheric processes linked to P nutrition participate in U absorption by *Lupinus albus* grown in hydroponics?. *Journal of Environmental Radioactivity* 124 :255-265.

Tantriani. 2016. Detection of metabolites in shoot, root, and root exudates of soybean under different potassium status. (Unpublished undergraduate thesis). Yamagata University, Japan.

Tawaraya, K., R. Horie, T. Shinano, T. Wagatsuma, K. Saito, A. Oikawa. 2014. Metabolite profiling of soybean root exudate under phosphorus deficiency. *Soil Science and Plant Nutrition* 60:679-694.

Terry, N. and A. Ulrich. 1973. Effects of Potassium Deficiency on the Photosynthesis and Respiration of Leaves of Sugar Beet. *Plant Physiology* 51: 783-786.

Tombesi, L., M. T. Cale, AND B. Tiborne. 1969. Effects of nitrogen, phosphorus and potassium fertilizers on the assimilation capacity of *Beta vulgaris* chloroplasts. *Plant Soil* 31: 65-76.

USDA. Natural Resource Conservation Service. *Lupinus* L. <https://plants.usda.gov/core/profile?symbol=LUPIN>. Retrieved on August 5, 2020.

Wagatsuma, T., T. Kawashima, and K. Tawaraya. 1998. Comparative stainability of plant root cells with basic dye (methylene blue) in association with aluminium tolerance. *Communications in Soil Science and Plant Analysis* 19:1207-1215.



Wang, Z., A.B.M.M. Rahman, G. Wang, U. Ludewig, J. Shen, G. Neumann. 2015. Hormonal

interactions during cluster-root development in phosphate-deficient white lupine (*Lupinus albus* L.). *Journal of Plant Physiology* 177: 74-82.

Wasaki, J., M. Omura, M. Ando, T. Shinano, M. Osaki, T. Tadano. 1999. Secreting portion of acid phosphatase in roots of Lupin (*Lupinus albus* L.) and key signal for the secretion from the roots. *Soil Science and Plant Nutrition* 45: 937-945.

Weisskopf, L., N. Tomasi, D. Santelia, E. Martinoia, N. B. Langlade, R. Tabacchi, and E. Abou-Mansour. 2006. Isoflavonoid exudation from white lupin roots is influenced by phosphate supply, root type and cluster-root stage. *New Phytologist* 171: 657–668.

Wu, X., A.S.M.F. Islam, N. Limpot, L. Mackasmiel, J. Mierzwa, A.J. Cortes, and M.W. Blair. 2020. Genome-wide SNP identification and association in mapping for seed mineral concentration in mungbean (*Vigna radiata* L.). *Frontier in Genetics* 11:656.

Yin, H., Y. Li, J. Xiao, Z. Xu, X. Cheng, and Q. Liu. 2013. Enhanced root exudation stimulates soil nitrogen transformations in a subalpine coniferous forest under experimental warming. *Global Change Biology* 19:2158-2167.