8. References

Abadia, A., F. Ambardbretteville, R. Remy, and A. Tremolieres. 1988. Iron deficiency in pea leaves- effect on lipid composition and synthesis. *Physiol. Plant*. 72:713-717.

Abadia, J. 1992. Leaf responses to iron deficiency - a review. *J. Plant Nutr.* 15:1699-1713.

Abadia, J., S. Vazquez, R. Rellan-Alvarez, H. El-Jendoubi, A. Abadia, A. Alvarez-Fernandez, and A.F. Lopez-Millan. 2011. Towards a knowledge-based correction of iron chlorosis. *Plant Physiology and Biochemistry*. 49:471-482.

Aerts, R., and F.S. Chapin. 2000. The mineral nutrition of wild plants revisited: A re-evaluation of processes and patterns. *In* Advances in Ecological Research, Vol. 30. A.H. Fitter and D.G. Raffaelli, editors. 1-67.

Agabbio, M., G. Lovicu, M. Pala, G. D'hallewin, M. Mura, and M. Schirra. 1999. Fruit canopy position effects on quality and storage response of "Torocco" oranges. *Acta Horticulturae*. 485:19-25.

Albano, J.P., and W.B. Miller. 2001a. Ferric ethylenediaminetetraacetic acid (Fe EDTA) photodegradation in commercially produced soluble fertilizers. *Horttechnology*. 11:265-267.

Albano, J.P., and W.B. Miller. 2001b. Photodegradation of Fe DTPA in nutrient solutions. I. Effects of irradiance, wavelength, and temperature. *Hortscience*. 36:313-316.

Albano, J.P., and W.B. Miller. 2001c. Photodegradation of Fe DTPA in nutrient solutions. II. Effects on root physiology and foliar Fe and Mn levels in Marigold. *Hortscience*. 36:317-320.

Albrigo, L.G. 1999. Effects of foliar applications of urea or nutriphite on flowering and yields of Valencia orange trees. *Proc. Fla. State Hort. Soc.* 112:1-4.

Albrigo, L.G. 2002. Foliar uptake of N-P-K sources and urea biuret tolerance in citrus. *Acta Horticulturae*. 594:627-633.

Alexander, A., and M. Schroeder. 1987. Modern trends in foliar fertilization. *J. Plant Nutr.* 10:1391-1399.

Ali, A.G., and C.J. Lovatt. 1994. Winter application of low biuret urea to the foliage of washington navel orange increased yield. *Journal of the American Society for Horticultural Science*. 119:1144-1150.

Allen, M. 1959. Role of the anion in magnesium uptake from foliar applications of its salts on apple. *Nature*. 184:995-995.

Alva, A.K., S. Paramasivam, A. Fares, T.A. Obreza, and A.W. Schumann. 2006a. Nitrogen best management practice for citrus trees II. Nitrogen fate, transport, and components of N budget. *Scientia Horticulturae*. 109:223-233.

Alva, A.K., S. Paramasivam, T.A. Obreza, and A.W. Schumann. 2006b. Nitrogen best management practice for citrus trees - I. Fruit yield, quality, and leaf nutritional status. *Scientia Horticulturae*. 107:233-244.

Alvarez-Fernandez, A., P. Garcia-Lavina, C. Fidalgo, J. Abadia, and A. Abadia. 2004. Foliar fertilization to control iron chlorosis in pear (*Pyrus communis* L.) trees. *Plant and Soil*. 263:5-15.

Aranda, I., L.F. Bergasa, L. Gil, and J.A. Pardos. 2001. Effects of relative irradiance on the leaf structure of *Fagus sylvatica* L. seedlings planted in the understory of a *Pinus sylvestris* L. stand after thinning. *Annals of Forest Science*. 58:673-680.

Arquero, O., D. Barranco, and M. Benlloch. 2006. Potassium starvation increases stomatal conductance in olive trees. *Hortscience*. 41:433-436.

Badawi, A.M., M.A. Mekawi, M.Z. Mohamed, A.S. Mohamed, and M.M. Khowdairy. 2007. Surface and biological activity of organoammonium hydrogen selenite surfactants. *Journal of Surfactants and Detergents*. 10:257-267.

Bai, R.Q., T.K. Schlegel, J. Schonherr, and P.W. Masinde. 2008. The effects of foliar applied $CaCl_2{\cdot}2HO_2$, $Ca(OH)_2$ and K_2CO_3 combined with the surfactants glucopon and plantacare on gas exchange of 1 year old apple (*Malus domestica* borkh.) and broad bean (*Vicia faba* L.) leaves. *Scientia Horticulturae*. 116:52-57.

Baker, E.A. 1974. Influence of environment on leaf wax development in *Brassica oleracea* var gemmifera. *New Phytologist*. 73:955-&966.

Barel, D., and C.A. Black. 1979a. Foliar application of P. 2. Yield responses of corn and soybeans sprayed with various condensed phosphates and P-N compounds in greenhouse and field experiments. *Agron. J.* 71:21-24.

Barel, D., and C.A. Black. 1979b. Foliar application of P. 1. Screening of various inorganic and organic P-compounds. *Agron. J.* 71:15-21.

Barnes, J.D., K.E. Percy, N.D. Paul, P. Jones, C.K. McLaughlin, P.M. Mullineaux, G. Creissen, and A.R. Wellburn. 1996. The influence of UV-B radiation on the physicochemical nature of tobacco (*Nicotiana tabacum* L.) leaf surfaces. *Journal of Experimental Botany*. 47:99-109.

Barraclough, P.B., and J. Haynes. 1996. The effect of foliar supplements of potassium nitrate and urea on the yield of winter wheat. *Fertilizer Research*. 44:217-223.

Barranco, D., H. Ercan, C. Munoz-Diez, A. Belaj, and O. Arquero. 2010. Factors influencing the efficiency of foliar sprays of monopotassium phosphate in the olive. *International Journal of Plant Production*. 4:235-240.

Barthlott, W., and C. Neinhuis. 1997. Purity of the sacred lotus, or escape from contamination in biological surfaces. *Planta*. 202:1-8.

Barthlott, W., C. Neinhuis, D. Cutler, F. Ditsch, I. Meusel, I. Theisen, and H. Wilhelmi. 1998. Classification and terminology of plant epicuticular waxes. *Botanical Journal of the Linnean Society*. 126:237-260.

Basiouny, F.M., and R.H. Biggs. 1976. Penetration of ^{59}Fe through isolated cuticles of citrus leaves. *Hortscience*. 11:417-419.

Basiouny, F.M., C.D. Leonard, and R.H. Biggs. 1970. Comparison of different iron formulations for effectiveness in correcting iron chlorosis in citrus. *Proceedings of the Florida State Horticultural Society*. 83:1-6.

Batten, G.D., I.F. Wardlaw, and M.J. Aston. 1986. Growth and the distribution of phosphorus in wheat developed under various phosphorus and temperature regimes. *Australian Journal of Agricultural Research*. 37:459-469.

Baur, P., H. Marzouk, and J. Schönherr. 1999. Estimation of path lengths for diffusion of organic compounds through leaf cuticles. *Plant Cell and Environment*. 22:291-299.

Ben-Gal, A. 2007. The contribution of foliar exposure to boron toxicity. *J. Plant Nutr.* 30:1705-1716.

Benbella, M., and G.M. Paulsen. 1998. Efficacy of treatments for delaying senescence of wheat leaves: II. Senescence and grain yield under field conditions. *Agron. J.* 90:332-338.

Beyer, M., S. Lau, and M. Knoche. 2005. Studies on water transport through the sweet cherry fruit surface: IX. Comparing permeability in water uptake and transpiration. *Planta*. 220:474-485.

Bi, G.H., and C.F. Scagel. 2008. Nitrogen uptake and mobilization by hydrangea leaves from foliar-sprayed urea in fall depend on plant nitrogen status. *Hortscience*. 43:2151-2154.

Blanco, A., V. Fernandez, and J. Val. 2010. Improving the performance of calcium-containing spray formulations to limit the incidence of bitter pit in apple (*Malus x domestica* borkh). *Scientia Horticulturae*. 127:23-28.

Blandino, M., and A. Reyneri. 2009. Effect of fungicide and foliar fertilizer application to winter wheat at anthesis on flag leaf senescence, grain yield, flour bread-making quality and DON contamination. *European Journal of Agronomy*. 30:275-282.

Blanpied, G.D. 1979. Effect of artificial rain water pH and calcium-concentration on the calcium and potassium in apple leaves. *Hortscience*. 14:706-708.

Bly, A.G., and H.J. Woodard. 2003. Foliar nitrogen application timing influence on grain yield and protein concentration of hard red winter and spring wheat. *Agron. J.* 95:335-338.

Bondada, B.R., D.M. Oosterhuis, and N.P. Tugwell. 1999. Cotton growth and yield as influenced by different timing of late-season foliar nitrogen fertilization. *Nutrient Cycling in Agroecosystems*. 54:1-8.

Bondada, B.R., P.D. Petracek, J.P. Syvertsen, and L.G. Albrigo. 2006. Cuticular penetration characteristics of urea in citrus leaves. *Journal of Horticultural Science & Biotechnology*. 81:219-224.

Bondada, B.R., J.P. Syvertsen, and L.G. Albrigo. 2001. Urea nitrogen uptake by citrus leaves. *Hortscience*. 36:1061-1065.

Boom, A., J.S.S. Damste, and J.W. de Leeuw. 2005. Cutan, a common aliphatic biopolymer in cuticles of drought-adapted plants. *Organic Geochemistry*. 36:595-601.

Boote, K.J., R.N. Gallaher, W.K. Robertson, K. Hinson, and L.C. Hammond. 1978. Effect of foliar fertilization on photosynthesis, leaf nutrition, and yield of soybeans. *Agron. J.* 70:787-791.

Borowski, E., and S. Michalek. 2010. The effect of foliar nutrition of spinach (*Spinacia oleracea* L.) with magnesium salts and urea on gas exchange, leaf yield and quality. *Acta Agrobot.* 63:77-85.

Bouma, D. 1969. Response of subterranean clover (*Trifolium subterraneum* L.) to foliar applications of phosphorus. *Australian Journal of Agricultural Research*. 20:435-445.

Bouma, D. 1975. Effects of some metabolic phosphorus-compounds on rates of photosynthesis of detached phosphorus-deficient subterranean clover leaves. *Journal of Experimental Botany*. 26:52-59.

Bowen, J.E. 1969. Absorption of copper zinc and manganese by sugarcane leaf tissue. *Plant Physiology*. 44:255-261.

Bowman, D.C., and J.L. Paul. 1992. Foliar absorption of urea, ammonium, and nitrate by perennial ryegrass turf. *Journal of the American Society for Horticultural Science*. 117:75-79.

Boynton, D. 1954. Nutrition by foliar application. *Annu. Rev. Plant Physiol. Plant Molec. Biol.* 5:31-54.

Brazee, R.D., M.J. Bukovac, and H. Zhu. 2004. Diffusion model for plant cuticular penetration by spray-applied weak organic acid bioregulator in presence or absence of ammonium nitrate. *Transactions of the American Society of Agricultural Engineers*. 47:629-635.

Bremner, J.M. 1995. Recent research on problems in the use of urea as a nitrogen fertilizer. *Fertilizer Research*. 42:321-329.

Brewer, C.A., W.K. Smith, and T.C. Vogelman. 1991. Functional interaction between leaf trichomes, leaf wettability and the optical properties of water droplets. *Plant Cell and Environment*. 14:955-962.

Bringe, K., C.F.A. Schumacher, M. Schmitz-Eiberger, U. Steiner, and E.C. Oerke. 2006. Ontogenetic variation in chemical and physical characteristics of adaxial apple leaf surfaces. *Phytochemistry*. 67:161-170.

Brown, P., N. Bellaloui, H. Hu, and A. Dandekar. 1999a. Transgenically enhanced sorbitol synthesis facilitates phloem boron transport and increases tolerance of tobacco to boron deficiency. *Plant Physiology*. 119:17.

Brown, P.H. 2001. Transient nutrient deficiencies and their impact on yield - a rationale for foliar fertilizers? *Acta Horticulturae*. 564:217-223.

Brown, P.H., and E. Bassil. 2011. Overview of the acquisition and utilization of boron, chlorine, copper, manganese, molybdenum, and nickel by plants and prospects for improvement of micronutrient use efficiency. *In* The molecular and physiological basis of nutrient use efficiency in crops. M.J. Hawkesford and P.B. Barraclough, editors. Wiley-Blackwell. 377-429.

Brown P.H., Bellaloui N., Hu H.N. and A. Dandekar, 1999. Transgenically enhanced sorbitol synthesis facilitates phloem boron transport and increases tolerance of tobacco to boron deficiency. *Plant Physiology* 119:17-20.

Brown, P.H., N. Bellaloui, M.A. Wimmer, E.S. Bassil, J. Ruiz, H. Hu, H. Pfeffer, F. Dannel, and V. Romheld. 2002. Boron in plant biology. *Plant Biology*. 4:205-223.

Brown, P.H., and H. Hu. 1998. Phloem boron mobility in diverse plant species. *Botanica Acta*. 111:331-335.

Brown, P.H., and H.N. Hu. 1996. Phloem mobility of boron is species dependent: Evidence for phloem mobility in sorbitol-rich species. *Annals of Botany*. 77:497-505.

Brown, P.H., S. Perica, L. Hendricks, K. Kelley, J. Grant, S. Sibbett, and H. Hu. 1999c. Foliar boron application to decrease PFA, increase fruit set and yield in walnut. *Walnut Marketing Board Annual Report*. 1999.

Brown, P.H., and B.J. Shelp. 1997. Boron mobility in plants. *Plant and Soil*. 193:85-101.

Buchholz, A., P. Baur, and J. Schönherr. 1998. Differences among plant species in cuticular permeabilities and solute mobilities are not caused by differential size selectivities. *Planta*. 206:322-328.

Bukovac, M.J. 1985. Citation classic - absorption and mobility of foliar applied nutrients. *Current Contents/Agriculture Biology & Environmental Sciences*:16-16.

Bukovac, M.J., J.A. Flore, and E.A. Baker. 1979. Peach leaf surfaces - changes in wettability, retention, cuticular permeability, and epicuticular wax chemistry during expansion with special reference to spray application. *Journal of the American Society for Horticultural Science*. 104:611-617.

Bukovac, M.J., and S.H. Wittwer. 1957. Absorption and mobility of foliar applied nutrients. *Plant Physiology*. 32:428-435.

Burkhardt, J. 2010. Hygroscopic particles on leaf surfaces: Nutrients or desiccants? *Ecological Monographs*. 80:369-399.

Butler Ellis, M.C., C.R. Tuck, and P.C.H. Miller. 1997. The effect of some adjuvants on sprays produced by agricultural flat fan nozzles. *Crop Protection*. 16:41-50.

Caetano, A.A. 1982. Estudo da eficiência de várias fontes dos micronutrientes, zinco, manganês e boro aplicados em pulverização na laranjeira valência (*Citrus sinensis* L. osbeck). *In* Agronomy. Vol. MS. Escola Superiorde Agricultura Luiz de Queiroz, Piricicaba.

Cakmak, I. 2008. Enrichment of cereal grains with zinc: Agronomic or genetic biofortification? *Plant and Soil*. 302:1-17.

Cakmak, I., M. Kalayci, Y. Kaya, A.A. Torun, N. Aydin, Y. Wang, Z. Arisoy, H. Erdem, A. Yazici, O. Gokmen, L. Ozturk, and W.J. Horst. 2010. Biofortification and localization of zinc in wheat grain. *Journal of Agricultural and Food Chemistry*. 58:9092-9102.

Cape, J.N., and K.E. Percy. 1993. Environmental influences on the development of spruce needle cuticles. *New Phytologist*. 125:787-799.

CF, P., and R. Graham. 1995. Transport of zinc and manganese to developing wheat grains. *Physiol. Plant*.

Chabot, B.F., and D.J. Hicks. 1982. The ecology of leaf life spans. *Annual Review of Ecology and Systematics*. 13:229-259.

Chamel, A. 1988. Foliar uptake of chemicals studied with whole plants and isolated cuticles. *In* Plant growth and leaf-applied chemicals. P. Neumann, editor. CRC Press, Boca Raton, Florida.

Chamel, A., M. Pineri, and M. Escoubes. 1991. Quantitative determination of water sorption by plant cuticles. *Plant Cell and Environment*. 14:87-95.

Chamel, A., and N. Vitton. 1996. Sorption and diffusion of ^{14}C-atrazine through isolated plant cuticles. *Chemosphere*. 33:995-1003.

Chamel, A.R. 1989. Permeability characteristics of isolated golden delicious apple fruit cuticles with regard to calcium. *Journal of the American Society for Horticultural Science*. 114:804-809.

Chatzistathis, T., I. Therios, and D. Alfigragis. 2009. Differential uptake, distribution within tissues, and use efficiency of manganese, iron, and zinc by olive cultivars kothreiki and koroneiki. *HortScience* .44(7): 1994-1999.

*Chen, Y.Z., J.M. Smagula, W. Litten, and S. Dunham. 1*998. Effect of boron and calcium foliar sprays on pollen germination and development, fruit set, seed development, and berry yield and quality in lowbush blueberry (*Vaccinium angustifolium* ait). *Journal of the American Society for Horticultural Science*. 123:524-531.

Cheng, G.W., and C.H. Crisosto. 1994. Development of dark skin discoloration on peach and nectarine fruit in response to exogenous contaminations. *Journal of the American Society for Horticultural Science*. 119:529-533.

Cheng, L., S. Dong, and L.H. Fuchigami. 2002. Urea uptake and nitrogen mobilization by apple leaves in relation to tree nitrogen status in autumn. *Journal of Horticultural Science & Biotechnology*. 77:13-18.

Chermahini, S.A., N. Moallemi, D.A. Nabati, and A.R. Shafieizargar. 2011. Winter application of foliar urea can promote some quantitative and qualitative characters of flower and fruit set of valencia orange trees. *Journal of Food Agriculture & Environment*. 9:252-255.

Chiu, S.T., L.H. Anton, F.W. Ewers, R. Hammerschmidt, and K.S. Pregitzer. 1992. Effects of fertilization on epicuticular wax morphology of needle leaves of douglas-fir, *Pseudotsuga menziesii* (pinaceae). *American Journal of Botany*. 79:149-154.

Christensen, P. 1980. Timing of zinc foliar sprays. 1. Effects of application intervals preceding and during the bloom and fruit-set stages. 2. Effects of day vs night application. *American Journal of Enology and Viticulture*. 31:53-59.

Clapp, J.G. 2009. Let's be careful when defining salt index. *Fluid Journal*. 17.

Cook, J.A., and D. Boynton. 1952. Some factors affecting the absorption of urea by McIntosh apple leaves. *Proceedings of the American Society for Horticultural Science*. 59:82-90.

Coret, J.M., and A.R. Chamel. 1993. Influence of some nonionic surfactants on water sorption by isolated tomato fruit cuticles in relation to cuticular penetration of glyphosate. *Pesticide Science*. 38:27-32.

Correia, M.A.R., R.D. Prado, L.S. Collier, D.E. Rosane, and L.M. Romualdo. 2008. Zinc forms of application in the nutrition and the initial growth of the culture of the rice. *Bioscience Journal*. 24:1-7.

Crisosto, C.H., F.G. Mitchell, and Z.G. Ju. 1999. Susceptibility to chilling injury of peach, nectarine, and plum cultivars grown in California. *Hortscience*. 34:1116-1118.

Cross, J. 1998. Anionic surfactants - an introduction. *In* Anionic surfactants. Analytical chemistry. Vol. J. Cross, editor. Marcel Deker, New York. 1-33.

Crowley, D.E., W.K. Smith, B. Faber, and J.A. Manthey. 1996. Zinc fertilization of avocado. *Hortscience*. 31:224-229.

Datnoff, L.E., Elmer, W.H., Huber, D.M. 2007. Mineral nutrition and plant disease. American Phytopathological Society, St Paul, MN. 278.

Day, J.M., R.J. Roughley, and J.F. Witty. 1979. Effect of planting density, inorganic nitrogen-fertilizer and supplementary carbon-dioxide on yield of *Vicia faba* L. *J. Agric. Sci.* 93:629-633.

De Schampheleire, S.B., D. Nuyttens, T.M. Baetens, W. Cornelis, D. Gabriels, and P. Spanoghe. 2008. Effects on pesticide spray drift of the physicochemical properties of the spray liquid. *Precision Agriculture* 10:409-420.

De Wet, E., P.J. Robbertse, and H.T. Groeneveld. 1989. The influence of temperature and boron on pollen germination in *Mangifera indica* L. *Sud Afrikan Tydskr. Plant Grond.* 6:228-234.

Deliopoulos, T., P.S. Kettlewell, and M.C. Hare. 2010. Fungal disease suppression by inorganic salts: A review. *Crop Protection*. 29:1059-1075.

Deshmukh, A.P., A.J. Simpson, C.M. Hadad, and P.G. Hatcher. 2005. Insights into the structure of cutin and cutan from *Agave americana* leaf cuticle using HRMAS NMR spectroscopy. *Organic Geochemistry*. 36:1072-1085.

Dickinson, D.B. 1978. Influence of borate and pentaerythritol concentrations on germination and tube growth of *Lilium longiflorum* pollen. *Journal of the American Society for Horticultural Science*. 103:413-416.

Dominguez, E., J. Cuartero, and A. Heredia. 2011. An overview on plant cuticle biomechanics. *Plant Science*. 181:77-84.

Dong, S.F., L.L. Cheng, C.F. Scagel, and L.H. Fuchigami. 2002. Nitrogen absorption, translocation and distribution from urea applied in autumn to leaves of young potted apple (*Malus domestica*) trees. *Tree Physiology*. 22:1305-1310.

Dong, S.F., L.L. Cheng, C.F. Scagel, and L.H. Fuchigami. 2005a. Timing of urea application affects leaf and root N uptake in young Fuji/M9 apple trees. *Journal of Horticultural Science & Biotechnology*. 80:116-120.

Dong, S.F., D. Neilsen, G.H. Neilsen, and L.H. Fuchigami. 2005b. Foliar N application reduces soil NO_3-N leaching loss in apple orchards. *Plant and Soil*. 268:357-366.

Dong, S.F., C.F. Scagel, L.L. Cheng, L.H. Fuchigami, and P.T. Rygiewicz. 2001. Soil temperature and plant growth stage influence nitrogen uptake and amino acid concentration of apple during early spring growth. *Tree Physiology*. 21:541-547.

Donkersley, P., and D. Nuyttens. 2011. A meta analysis of spray drift sampling. *Crop Protection*. 30:931-936.

Dordas, C. 2006. Foliar boron application improves seed set, seed yield, and seed quality of alfalfa. *Agron. J.* 98:907-913.

Dordas, C. 2009. Role of nutrients in controlling plant diseases in sustainable agriculture. *Agronomy for Sustainable Development*. 28:33-46.

Drew, M.J. 1988. Effects of flooding and oxygen deficiency on plant mineral nutrition. *In* Advances in Plant Nutrition. Vol. 1. A. Lauchli and T. PB, editors. Praeger, New York. 115-159.

Du Plooy, G.W., C.F. Van Der Merwe, and L. Korsten. 2006. Lenticel discolouration in mango (*Mangifera indica* L.) fruit - a cytological study of mesophyll cells from affected tissue. *Journal of Horticultural Science & Biotechnology*. 81:869-873.

Dybing, C.D., and H.B. Currier. 1961. Foliar penetration by chemicals. *Plant Physiology*. 36:169-174.

Ebrahim, M.K.H., and M.M. Aly. 2004. Physiological response of wheat to foliar application of zinc and inoculation with some bacterial fertilizers. *J. Plant Nutr.* 27:1859-1874.

Eichert, T., and J. Burkhardt. 2001. Quantification of stomatal uptake of ionic solutes using a new model system. *Journal of Experimental Botany*. 52:771-781.

Eichert, T., and H.E. Goldbach. 2008. Equivalent pore radii of hydrophilic foliar uptake routes in stomatous and astomatous leaf surfaces - further evidence for a stomatal pathway. *Physiol. Plant.* 132:491-502.

Eichert, T., H.E. Goldbach, and J. Burkhardt. 1998. Evidence for the uptake of large anions through stomatal pores. *Botanica Acta*. 111:461-466.

Eichert, T., J.J. Peguero-Pina, E. Gil-Pelegrin, A. Heredia, and V. Fernandez. 2010. Effects of iron chlorosis and iron resupply on leaf xylem architecture, water relations, gas

exchange and stomatal performance of field-grown peach (*Prunus persica*). *Physiol. Plant.* 138:48-59.

Eichert T., and V. Fernández. 2011. Uptake and release of elements by leaves and other aerial plant parts. *In* Marschners' mineral nutrition of higher plants. P. Marschner, editor. Academic Press, Oxford. 71-84.

El-Hilali, F., A. Ait-Qubahou, A. Remah, and O. Akhayat. 2004. Effect of preharvest spray of Ca and K on quality, peel disorders and peroxidases activity of 'Fortune' mandarin fruit in low temperature storage. *Acta Horticulturae*. 632:309-315.

El-Otmani, M., A. Ait-Qubahou, F.Z. Taibi, and C.J. Lovatt. 2002. Efficacy of foliar urea as N source in sustainable citrus production systems. *Acta Horticulturae*. 594:611-617.

El-Otmani, M., C.W. Coggins, M. Agusti, and C.J. Lovatt. 2000. Plant growth regulators in citriculture: World current uses. *Critical Reviews in Plant Sciences*. 19:395-447.

Elattal, Z.M., O.K. Moustafa, and S.A. Diab. 1984. Influence of foliar fertilizers on the toxicity and tolerance to some insecticides in the cotton leafworm. *J. Agric. Sci.* 102:111-114.

Elshatshat, S., L. Schreiber, and J. Schonherr. 2007. Some cesium and potassium salts increase the water permeability of astomatous isolated plant cuticles. *Journal of Plant Nutrition and Soil Science-Zeitschrift für Pflanzenernahrung und Bodenkunde*. 170:59-64.

Epstein, E., and A.J. Bloom. 2005. Mineral nutrition of plants: Principles and perspectives. 380.

Erenoglu, B., M. Nikolic, V. Romheld, and I. Cakmak. 2002. Uptake and transport of foliar applied zinc (^{65}Zn) in bread and durum wheat cultivars differing in zinc efficiency. *Plant and Soil*. 241:251-257.

Eskew, D.L., and R.M. Welch. 1982. Nickel supplementation 1 microgram per liter prevents leaflet tip necrosis in soybeans grown in nutrient solutions purified using 8 hydroxy quinoline controlled pore glass chromatography. *Plant Physiology*. 69:43.

Everett, R.L., and D.F. Thran. 1992. Nutrient dynamics in single leaf pinyon (*Pinus-monophylla* torr and frem) needles. *Tree Physiology*. 10:59-68.

Faber, B., and J.A. Manthey. 1996. Zinc fertilization of avocado trees. *Hortscience*. 31:224-229.

Fageria, N.K., M.P. Barbosa, A. Moreira, and C.M. Guimaraes. 2009. Foliar fertilization of crop plants. *J. Plant Nutr.* 32:1044-1064.

Fahn, A. 1986. Structural and functional-properties of trichomes of xeromorphic leaves. *Annals of Botany*. 57:631-637.

Fang, Y., L. Wang, Z. Xin, L.Y. Zhao, X.X. An, and Q.H. Hu. 2008. Effect of foliar application of zinc, selenium, and iron fertilizers on nutrients concentration and yield of rice grain in China. *Journal of Agricultural and Food Chemistry*. 56:2079-2084.

Fernandez, V., V. Del Rio, J. Abadia, and A. Abadia. 2006. Foliar iron fertilization of peach (*Prunus persica* L. batsch): Effects of iron compounds, surfactants and other adjuvants. *Plant and Soil*. 289:239-252.

Fernandez, V., V. Del Rio, L. Pumarino, E. Igartua, J. Abadia, and A. Abadia. 2008a. Foliar fertilization of peach (*Prunus persica* L. batsch) with different iron formulations:

Effects on re-greening, iron concentration and mineral composition in treated and untreated leaf surfaces. *Scientia Horticulturae*. 117:241-248.

Fernandez, V., and G. Ebert. 2005. Foliar iron fertilization: A critical review. *J. Plant Nutr.* 28:2113-2124.

Fernandez, V., and T. Eichert. 2009. Uptake of hydrophilic solutes through plant leaves: Current state of knowledge and perspectives of foliar fertilization. *Critical Reviews in Plant Sciences*. 28:36-68.

Fernandez, V., T. Eichert, V. Del Rio, G. Lopez-Casado, J.A. Heredia-Guerrero, A. Abadia, A. Heredia, and J. Abadia. 2008b. Leaf structural changes associated with iron deficiency chlorosis in field-grown pear and peach: Physiological implications. *Plant and Soil*. 311:161-172.

Fernandez, V., M. Khayet, P. Montero-Prado, J. Alejandro Heredia-Guerrero, G. Liakopoulos, G. Karabourniotis, V. del Rio, E. Dominguez, I. Tacchini, C. Nerin, J. Val, and A. Heredia. 2011. New insights into the properties of pubescent surfaces: Peach fruit as a model. *Plant Physiology*. 156:2098-2108.

Fernandez, V., I. Orera, J. Abadia, and A. Abadia. 2009. Foliar iron-fertilisation of fruit trees: Present knowledge and future perspectives - a review. *Journal of Horticultural Science & Biotechnology*. 84:1-6.

Fernandez-Escobar, R., J.M. Garcia-Novelo, and H. Restrepo-Diaz. 2011. Mobilization of nitrogen in the olive bearing shoots after foliar application of urea. *Scientia Horticulturae*. 127:452-454.

Ferrandon, M., and A.R. Chamel. 1988. Cuticular retention, foliar absorption and translocation of Fe, Mn and Zn supplied in organic and inorganic form. *J. Plant Nutr.* 11:247-263.

Fischer, R.A., and T.C. Hsiao. 1968. Stomatal opening in isolated epidermal strips of *Vicia faba*. II. Responses to KCl concentration and role of potassium absorption. *Plant Physiology*. 43:1953-1958.

Fisher, E.G. 1952. The principles underlying foliage applications of urea for nitrogen fertilization of the McIntosh apple. *Proceedings of the American Society for Horticultural Science*. 59:91-98.

Forshey, C.G. 1963. The effect of nitrogen status of Mclntosh apple trees in sand culture on the absorption of magnesium from epsom salts sprays. *Proc Amer Soc Hort Sci*. 83:21-31.

Franke, W. 1967. Mechanisms of foliar penetration of solutions. *Annual Review of Plant Physiology*. 18:281-300.

Freeborn, J.R., D.L. Holshouser, M.M. Alley, N.L. Powell, and D.M. Orcutt. 2001. Soybean yield response to reproductive stage soil-applied nitrogen and foliar-applied boron. *Agron. J.* 93:1200-1209.

Freeman, B., L.G. Albrigo, and R.H. Biggs. 1979. Ultrastructure and chemistry of cuticular waxes of developing citrus leaves and fruits. *Journal of the American Society for Horticultural Science*. 104:801-808.

Garcia, R.L., and J.J. Hanway. 1976. Foliar fertilization of soybeans during seed-filling period. *Agron. J.* 68:653-657.

Garcia-Lavina, P., A. Alvarez-Fernandez, J. Abadia, and A. Abadia. 2002. Foliar applications of acids with and without $FeSO_4$ to control chlorosis in pear. *Acta Horticulturae*. 594:217-222.

Garnett, T.P., and R.D. Graham. 2005. Distribution and remobilization of iron and copper in wheat. *Annals of Botany*. 95:817-826.

Gerik, T.J., D.M. Oosterhuis, and H.A. Torbert. 1998. Managing cotton nitrogen supply. *Advances in Agronomy,* Vol 64. 64:115-147.

Gheibi, M., M. Malakouti, B. Kholdebarin, F. Ghanati, S. Teimouri, and R. Sayadi. 2009. Significance of nickel supply for growth and chlorophyll content of wheat supplied with urea or ammonium nitrate. *J. Plant Nutr.* 32:1440-1450.

Gholami, A., S. Akhlaghi, S. Shahsavani, and N. Farrokhi. 2011. Effects of urea foliar application on grain yield and quality of winter wheat. *Commun. Soil Sci. Plant Anal.* 42:719-727.

Gibert, C., F. Lescourret, M. Genard, G. Vercambre, and A.P. Pastor. 2005. Modelling the effect of fruit growth on surface conductance to water vapour diffusion. *Annals of Botany*. 95:673-683.

Girma, K., K.L. Martin, K.W. Freeman, J. Mosali, R.K. Teal, W.R. Raun, S.M. Moges, and D.B. Arnall. 2007. Determination of optimum rate and growth stage for foliar-applied phosphorus in corn. *Commun. Soil Sci. Plant Anal.* 38:1137-1154.

Giskin, M., and Y. Efron. 1986. Planting date and foliar fertilization of corn grown for silage and grain under limited moisture. *Agron. J.* 78:426-429.

Glendinnig, J.S. 1999. Australian Soil Fertility Manual. CSIRO Publishing, Melbourne, Australia.

Glenn, G.M., and B.W. Poovaiah. 1985. Cuticular permeability to calcium compounds in Golden Delicious apple fruit. *Journal of the American Society for Horticultural Science*. 110:192-195.

Gonzalez, D., A. Obrador, and J.M. Alvarez. 2007. Behavior of zinc from six organic fertilizers applied to a navy bean crop grown in a calcareous soil. *Journal of Agricultural and Food Chemistry*. 55:7084-7092.

Gooding, M.J., and W.P. Davies. 1992. Foliar urea fertilization of cereals - a review. *Fertilizer Research*. 32:209-222.

Gordon, D., and T.M. Dejong. 2007. Current-year and subsequent-year effects of crop-load manipulation and epicormic-shoot removal on distribution of long, short and epicormic shoot growth in *Prunus persica*. *Annals of Botany*. 99:323-332.

Graham, R.D., R.J. Hannam, and N. Uren. 1988. Manganese in Soils and Plants. Kluwer Academic Press, Dordrecht, Netherlands. 388.

Grant, C.A., D.N. Flaten, D.J. Tomasiewicz, and S.C. Sheppard. 2001. The importance of early season phosphorus nutrition. *Can. J. Plant Sci.* 81:211-224.

Gray, R.C., and G.W. Akin. 1984. Foliar fertlization *In* Nitrogen in Crop Production. R.D. Hauck, editor. American Agronomy Society, Madison. 579-584.

Green, J.M., and C.L. Foy. 2000. Adjuvants: Test design, interpretation, and presentation of results. *Weed Technology*. 14:819-825.

Greenway, H., and R. Munns. 1980. Mechanisms of salt tolerance in non-halophytes. *Annu. Rev. Plant Physiol. Plant Molec. Biol.* 31:149-190.

Grignon, C., and H. Sentenac. 1991. pH and ionic conditions in the apoplast. *Annu. Rev. Plant Physiol. Plant Molec. Biol.* 42:103-128.

Guak, S., D. Neilsen, P. Millard, and N.E. Looney. 2004. Leaf absorption, withdrawal and remobilization of autumn-applied urea-N in apple. *Can. J. Plant Sci.* 84:259-264.

Guertal, E.A., A.O. Abaye, B.M. Lippert, G.S. Miner, and G.J. Gascho. 1996. Sources of boron for foliar fertilization of cotton and soybean. *Commun. Soil Sci. Plant Anal.* 27:2815-2828.

Guest, P.L., and H.D. Chapman. 1949. Investigations on the use of iron sprays, dusts, and soil applications to control iron chlorosis of citrus. *Proceedings of the American Society for Horticultural Science*. 54:11-21.

Guvenc, I., A. Karatas, and H.C. Kaymak. 2006. Effect of foliar applications of urea, ethanol and putrecine on growth and yield of lettuce (*Lactuca sativa*). *Indian Journal of Agricultural Sciences*. 76:23-25.

Gwathmey, C.O., C.L. Main, and X.H. Yin. 2009. Potassium uptake and partitioning relative to dry matter accumulation in cotton cultivars differing in maturity. *Agron. J.* 101:1479-1488.

Haefs, R., M. Schmitz-Eiberger, H.D. Mohr, and G. Noga. 2002. Improvement of Mg uptake of grapevine by use of rapeseed oil ethoxylates for foliar application of Mg. *Vitis*. 41:7-10.

Hanson, E.J. 1991. Movement of boron out of tree fruit leaves. *Hortscience*. 26:271-273.

Haq, M.U., and A.P. Mallarino. 1998. Foliar fertilization of soybean at early vegetative stages. *Agron. J.* 90:763-769.

Haq, M.U., and A.P. Mallarino. 2005. Response of soybean grain oil and protein concentrations to foliar and soil fertilization. *Agron. J.* 97:910-918.

Harder, H.J., R.E. Carlson, and R.H. Shaw. 1982. Leaf photosynthetic response to foliar fertilizer applied to corn plants during grain fill. *Agron. J.* 74:759-761.

Harker, F.R., and I.B. Ferguson. 1988. Transport of calcium across cuticles isolated from apple fruit. *Scientia Horticulturae*. 36:205-217.

Harker, F.R., and I.B. Ferguson. 1991. Effects of surfactants on calcium penetration of cuticles isolated from apple fruit. *Scientia Horticulturae*. 46:225-233.

Haslett, B.S., R.J. Reid, and Z. Rengel. 2001. Zinc mobility in wheat: Uptake and distribution of zinc applied to leaves or roots. *Annals of Botany*. 87:379-386.

Hazen, J.L. 2000. Adjuvants - terminology, classification, and chemistry. *Weed Technology*. 14:773-784.

Hellmann, M., and R. Stosser. 1992. Development of cuticle thickness and epidermal-cells of apple leaves. *Gartenbauwissenschaft*. 57:223-227.

Heredia, A. 2003. Biophysical and biochemical characteristics of cutin, a plant barrier biopolymer. *Biochimica Et Biophysica Acta-General Subjects*. 1620:1-7.

Herren, T., and U. Feller. 1994. Transfer of zinc from xylem to phloem in the peduncle of wheat. *J. Plant Nutr.* 17:1587-1598.

Hesse, C.O., and W.H. Griggs. 1950. The effect of gland type on the wettability and water retention of peach leaves. *Proceedings of the American Society for Horticultural Science*. 56:173-180.

Hewitt, A.J. 2008. Droplet size spectra classification categories in aerial application scenarios. *Crop Protection*. 27:1284-1288.

Hill, J., A.D. Robson, and J.F. Loneragan. 1979a. Effect of copper supply on the senescence and the retranslocation of nutrients of the oldest leaf of wheat. *Annals of Botany*. 44:279-287.

Hill, J., A.D. Robson, and J.F. Loneragan. 1979b. Effects of copper and nitrogen supply on the distribution of copper in dissected wheat grains. *Australian Journal of Agricultural Research*. 30:233-237.

Hill-Cottingham, D.G., and C.P. Lloydjones. 1975. Nitrogen ^{15}N in apple nutrition investigations. *Journal of the Science of Food and Agriculture*. 26:165-173.

Hocking, P.J. 1994. Dry-matter production, mineral nutrient concentrations, and nutrient distribution and redistribution in irrigated spring wheat. *J. Plant Nutr.* 17:1289-1308.

Hocking, P.J., and J.S. Pate. 1977. Mobilization of minerals to developing seeds of legumes. *Annals of Botany*. 41:1259-1278.

Hogue, E.J., and G.H. Neilsen. 1986. Effect of root temperature and varying cation ratios on growth and leaf cation concentration of apple seedlings grown in nutrient solution. *Can. J. Plant Sci.* 66:637-645.

Holloway, P.J. 1969. Effects of superficial wax on leaf wettability. *Annals of Applied Biology*. 63:145-153.

Horesh, I., and Y. Levy. 1981. Response of iron-deficient citrus trees to foliar iron sprays with a low-surface-tension surfactant. *Scientia Horticulturae*. 15:227-233.

Hsu, H.H. 1986. The absorption and distribution of metalosates from foliar fertilization. *In* Foliar Feeding of Plants with Amino Acid Chelates. H. De Wayne Ashmead, editor. Noyes Publications, Park Ridge, NJ. 236-354.

Hu, H., and P.H. Brown. 1994. Localization of boron in cell walls of squash and tobacco and its association with pectin. *Plant Physiology*. 105:681-689.

Huang, L.B., R.W. Bell, and B. Dell. 2008. Evidence of phloem boron transport in response to interrupted boron supply in white lupin (*Lupinus albus* L. Cv. Kiev mutant) at the reproductive stage. *Journal of Experimental Botany*. 59:575-583.

Huett, D.O., and I. Vimpany. 2006. An evaluation of foliar nitrogen and zinc applications to macadamia. *Australian Journal of Experimental Agriculture*. 46:1373-1378.

Hull, H.M., H.L. Morton, and J.R. Wharrie. 1975. Environmental influences on cuticle development and resultant foliar penetration. *Botanical Review*. 41:421-452.

Hull, H.M. 1970. Leaf structure related to absorption of pesticides and other compounds. *Residue Rev*. 31: 1-155.

Seasonal assimilate metabolism in evergreen and deciduous conifers. *Plant Physiology*. 46:5.

Hundt, I., and W. Podlesak. 1990. Weather effects on N uptake from foliar-applied urea ammonium-nitrate in cereals. *Archiv für Acker und Pflanzenbau und Bodenkunde-Archives of Agronomy and Soil Science*. 34:757-764.

Hunsche, M., M.M. Blanke, and G. Noga. 2010. Does the microclimate under hail nets influence micromorphological characteristics of apple leaves and cuticles? *Journal of Plant Physiology*. 167:974-980.

Hunsche, U., F. Walter, and H. Schnier. 2004. Evolution and failure of the opalinus clay: Relationship between deformation and damage, experimental results and constitutive equation. *Applied Clay Science*. 26:403-411.

Jackson, J.E., and J.W. Palmer. 1980. A computer-model study of light interception by orchards in relation to mechanized harvesting and management. *Scientia Horticulturae*. 13:1-7.

Jackson, J.F. 1989. Borate control of protein secretion from petunia pollen exhibits critical temperature discontinuities. *Sexual Plant Reproduction*. 2:11-14.

Jacoby, B. 1975. Light sensitivity of ^{22}Na, ^{86}Rb, ^{42}K absorption by different tissues of bean-leaves. *Plant Physiology*. 55:978-981.

Jarvinen, R., M. Kaimainen, and H. Kallio. 2010. Cutin composition of selected northern berries and seeds. *Food Chemistry*. 122:137-144.

Jeffree, C.E. 2006. The fine structure of the plant cuticle. *In* Biology of the Plant Cuticle. Vol. 23. M.M.C. Riederer, editor. 11-125.

Jensen, P.K., L.N. Jorgensen, and E. Kirknel. 2001. Biological efficacy of herbicides and fungicides applied with low-drift and twin-fluid nozzles. *Crop Protection*. 20:57-64.

Jeschke, W.D., and W. Hartung. 2000. Root-shoot interactions in mineral nutrition. *Plant and Soil*. 226:57-69.

Jeschke, W.D., J.S. Pate, and C.A. Atkins. 1987. Partitioning of K^+, Na^+, Mg^{++}, and Ca^{++} through xylem and phloem to component organs of nodulated white lupin under mild salinity. *Journal of Plant Physiology*. 128:77-93.

Jetter, R., and S. Schaffer. 2001. Chemical composition of the *Prunus laurocerasus* leaf surface. Dynamic changes of the epicuticular wax film during leaf development. *Plant Physiology*. 126:1725-1737.

Jifon, J.L., and G.E. Lester. 2009. Foliar potassium fertilization improves fruit quality of field-grown muskmelon on calcareous soils in south Texas. *Journal of the Science of Food and Agriculture*. 89:2452-2460.

Johnson, E.J., O. Dorot, J. Liu, B. Chefetz, and B. Xing. 2007. Spectroscopic characterization of aliphatic moieties in four plant cuticles. *Commun. Soil Sci. Plant Anal.* 38:2461-2478.

Johnson, H.B. 1975. Plant pubescence: An ecological perspective. *Botanical Review*. 41:235-258.

Johnson, R.S., R. Rosecrance, S. Weinbaum, H. Andris, and J.Z. Wang. 2001. Can we approach complete dependence on foliar-applied urea nitrogen in an early-maturing peach? *Journal of the American Society for Horticultural Science*. 126:364-370.

Jones, C., K. Olson-Rutz, and C. Dinkins, P. 2009. Nutrient uptake timing by crops: To assist with fertilizer timing. *Montana State University, Extension*:1-7.

Jongruaysup, S., B. Dell, and R.W. Bell. 1994. Distribution and redistribution of molybdenum in black gram (*Vigna mungo* L. hepper) in relation to molybdenum supply. *Annals of Botany*. 73:161-167.

Jongruaysup, S., B. Dell, R.W. Bell, G.W. Ohara, and J.S. Bradley. 1997. Effect of molybdenum and inorganic nitrogen on molybdenum redistribution in black gram (*Vigna mungo* L. hepper) with particular reference to seed fill. *Annals of Botany*. 79:67-74.

Jyung, W.H., S.H. Wittwer, and M.J. Bukovac. 1965. Role of stomata in foliar absorption of Rb by leaves of tobacco bean and tomato. *Proceedings of the American Society for Horticultural Science*. 86:361-& 367.

Kadman, A., and A. Cohen. 1977. Experiments with zinc application to avocado trees. *Israel Journal of Botany*. 26:50-50.

Kannan, S. 1986. Foliar absorption and transport of inorganic nutrients. *Critical Reviews in Plant Sciences*. 4:341-375.

Kannan, S. 2010. Foliar fertilization for sustainable crop production. *Sustainable Agriculture Reviews*. 4:371-402.

Karabourniotis, G., and G. Liakopoulos. 2005. Phenolic compounds in plant cuticles: Physiological and ecophysiological aspects. *Advances in Plant Physiology*. 8:33-47.

Karak, T., D.K. Das, and D. Maiti. 2006. Yield and zinc uptake in rice (*Oryza sativa*) as influenced by sources and times of zinc application. *Indian Journal of Agricultural Sciences*. 76:346-348.

Kaya, C., and D. Higgs. 2002. Response of tomato (*Lycopersicon esculentum* L.) cultivars to foliar application of zinc when grown in sand culture at low zinc. *Scientia Horticulturae*. 93:53-64.

Kerstiens, G. 2010. Plant cuticle. ELS.

Keshavarz, K., K. Vandati, M. Samar, B. Azadegan, and P.H. Brown. 2011. Foliar application of zinc and boron improves walnut vegetative and reproductive growth. *Horttechnology*. 21:181-186.

Khan, F.A., J.S. Ellenberger, N.B. Birchfield, M. Kosuko, and G. Rothman. 2011. Validation testing of drift reduction technology testing protocol. *ASTM Special Technical Publication*. 1527 STP:238-248.

Kinaci, E., and N. Gulmezoglu. 2007. Grain yield and yield components of triticale upon application of different foliar fertilizers. *Interciencia*. 32:624-628.

Kirkwood, R.C. 1993. Use and mode of action of adjuvants for herbicides - a review of some current work. *Pesticide Science*. 38:93-102.

Klein, I., and S.A. Weinbaum. 1984. Foliar application of urea to olive - translocation of urea nitrogen as influenced by sink demand and nitrogen deficiency. *Journal of the American Society for Horticultural Science*. 109:356-360.

Klein, I., and S.A. Weinbaum. 1985. Foliar application of urea to almond and olive - leaf retention and kinetics of uptake. *J. Plant Nutr.* 8:117-129.

Kluge, R. 1990. Symptom-related toxic threshold values of plants for the evaluation of excess of boron (B) in selected crops. *Agribiological Research-Zeitschrift für Agrarbiologie Agrikulturchemie Okologie*. 43:234-243.

Knoche, M. 1994. Organosilicone surfactant performance in agricultural spray application - a review. *Weed Research*. 34:221-239.

Knoche, M., H. Tamura, and M.J. Bukovac. 1991. Stability of the organosilicone surfactant silwet L-77 in growth-regulator sprays. *Hortscience*. 26:1498-1500.

Koch, K., and H.-J. Ensikat. 2008. The hydrophobic coatings of plant surfaces: Epicuticular wax crystals and their morphologies, crystallinity and molecular self-assembly. *Micron*. 39:759-772.

Koch, K., K.D. Hartmann, L. Schreiber, W. Barthlott, and C. Neinhuis. 2006. Influences of air humidity during the cultivation of plants on wax chemical composition, morphology and leaf surface wettability. *Environmental and Experimental Botany*. 56:1-9.

Kolattukudy, P.E. 1980. Bio-polyester membranes of plants - cutin and suberin. *Science*. 208:990-1000.

Kosma, D.K., B. Bourdenx, A. Bernard, E.P. Parsons, S. Lue, J. Joubes, and M.A. Jenks. 2009. The impact of water deficiency on leaf cuticle lipids of arabidopsis. *Plant Physiology*. 151:1918-1929.

Koutinas, N., T. Sotiropoulos, A. Petridis, D. Almaliotis, E. Deligeorgis, I. Therios, and N. Voulgarakis. 2010. Effects of preharvest calcium foliar sprays on several fruit quality attributes and nutritional status of the kiwifruit cultivar Tsechelidis. *Hortscience*. 45:984-987.

Kraemer, T., M. Hunsche, and G. Noga. 2009a. Cuticular calcium penetration is directly related to the area covered by calcium within droplet spread area. *Scientia Horticulturae*. 120:201-206.

Kraemer, T., M. Hunsche, and G. Noga. 2009b. Selected calcium salt formulations: Interactions between spray deposit characteristics and Ca penetration with consequences for rain-induced wash-off. *J. Plant Nutr.* 32:1718-1730.

Krogmeier, M.J., G.W. McCarty, and J.M. Bremner. 1989. Phytotoxicity of foliar applied urea. *Proceedings of the National Academy of Sciences of the United States of America*. 86:8189-8191.

Krogmeier, M.J., G.W. McCarty, D.R. Shogren, and J.M. Bremner. 1991. Effect of nickel deficiency in soybeans on the phytotoxicity of foliar-applied urea. *Plant and Soil*. 135:283-286.

Kutman, U.B., B. Yildiz, and I. Cakmak. 2011. Effect of nitrogen on uptake, remobilization and partitioning of zinc and iron throughout the development of durum wheat. *Plant and Soil*. 342:149-164.

Lakso, A.N. 1980. Correlations of fisheye photography to canopy structure, light climate, and biological responses to light in apple-trees. *Journal of the American Society for Horticultural Science*. 105:43-46.

Last, P.J., and K.M.R. Bean. 1991. Controlling manganese deficiency in sugar-beet with foliar sprays. *J. Agric. Sci.* 116:351-358.

Lauer, D.A. 1982. Foliar fertilization of dry beans with Zn and NPKs. *Agron. J.* 74:339-343.

Law, S.E. 2001. Agricultural electrostatic spray application: A review of significant research and development during the 20th century. *Journal of Electrostatics*. 51-52:25-42.

Laywisadkul, S., C.F. Scagel, L.H. Fuchigami, and R.G. Linderman. 2010. Spraying leaves of pear nursery trees with urea and copper ethylenediaminetetraacetic acid alters tree nitrogen concentration without influencing tree susceptibility to phytophthora syringae. *Horttechnology*. 20:331-342.

Leach, K.A., and A. Hameleers. 2001. The effects of a foliar spray containing phosphorus and zinc on the development, composition and yield of forage maize. *Grass and Forage Science*. 56:311-315.

Leacox, J.D., and J.P. Syvertsen. 1995. Nitrogen uptake by citrus leaves. *Journal of the American Society for Horticultural Science*. 120:505-509.

Leaper, C., and P.J. Holloway. 2002. Adjuvants and glyphosate activity. *Pesticide Management Science*. 56:313-319.

Lee, S.H., W.S. Kim, and T.H. Han. 2009. Effects of post-harvest foliar boron and calcium applications on subsequent season's pollen germination and pollen tube growth of pear (Pyrus pyrifolia). *Scientia Horticulturae*. 122:77-82.

Leece, D.R. 1976. Composition and ultrastructure of leaf cuticles from fruit trees relative to differential foliar absorption. *Australian Journal of Plant Physiology*. 3:833-847.

Leece, D.R. 1978. Foliar absorption in *Prunus domestica* L. 1. Nature and development of the surface wax barrier. *Australian Journal of Plant Physiology*. 5:749-766.

Leite, V.M., P.H. Brown, and C.A. Rosolem. 2007. Boron translocation in coffee trees. *Plant and Soil*. 290:221-229.

Lenk, S., L. Chaerle, E.E. Pfundel, G. Langsdorf, D. Hagenbeek, H.K. Lichtenthaler, D. Van der Straeten, and C. Buschmann. 2007. Multispectral fluorescence and reflectance imaging at the leaf level and its possible applications. *Journal of Experimental Botany*. 58:807-814.

Lester, G.E., J.L. Jifon, and D.J. Makus. 2010. Impact of potassium nutrition on postharvest fruit quality: Melon (*Cucumis melo* L.) case study. *Plant and Soil*. 335:117-131.

Lester, G.E., J.L. Mon, and D.J. Makus. 2006. Supplemental foliar potassium applications with or without a surfactant can enhance netted muskmelon quality. *Hortscience*. 41:741-744.

Leyshon, A.J., and R.W. Sheard. 1974. Influence of short-term flooding on growth and plant nutrient composition of barley. *Canadian Journal of Soil Science*. 54:463-473.

Liakopoulos, G., S. Stavrianakou, and G. Karabourniotis. 2001. Analysis of epicuticular phenolics of *Prunus persica* and *Olea europaea* leaves: Evidence on the chemical origin of the UV-induced blue fluorescence of stomata. *Annals of Botany*. 87:641-648.

Liakopoulos, G., S. Stavrianakou, D. Nikolopoulos, E. Karvonis, K.A. Vekkos, V. Psaroudi, and G. Karabourniotis. 2009. Quantitative relationships between boron and mannitol concentrations in phloem exudates of *Olea europaea* leaves under contrasting boron supply conditions. *Plant and Soil*. 323:177-186.

Lidster, P.D., S.W. Porritt, and G.W. Eaton. 1977. Effect of storage relative humidity on calcium-uptake by Spartan apple. *Journal of the American Society for Horticultural Science*. 102:394-396.

Limm, E.B., K.A. Simonin, A.G. Bothman, and T.E. Dawson. 2009. Foliar water uptake: A common water acquisition strategy for plants of the redwood forest. *Oecologia*. 161:449-459.

Ling, F., and M. Silberbush. 2002. Response of maize to foliar vs. soil application of nitrogen-phosphorus-potassium fertilizers. *J. Plant Nutr.* 25:2333-2342.

Liu, Z.Q. 2004. Effects of surfactants on foliar uptake of herbicides - a complex scenario. *Colloids and Surfaces B-Biointerfaces*. 35:149-153.

Lotze, E., J. Joubert, and K.I. Theron. 2008. Evaluating pre-harvest foliar calcium applications to increase fruit calcium and reduce bitter pit in 'Golden Delicious' apples. *Scientia Horticulturae*. 116:299-304.

Lovatt, C.J. 1990. A definitive test to determine whether phosphate fertilization can replace phosphate fertilization to supply P in the metabolism of hass on Duke 7. *California Avocado Society Yearbook* 81:61-64.

Lovatt, C.J., Y.S. Zheng, and K.D. Hake. 1988. Demonstration of a change in nitrogen-metabolism influencing flower initiation in citrus. *Israel Journal of Botany*. 37:181-188.

Luque, P., S. Bruque, and A. Heredia. 1995. Water permeability of isolated cuticular membranes - a structural-analysis. *Archives of Biochemistry and Biophysics*. 317:417-422.

Lurie, S., E. Fallik, and J.D. Klein. 1996. The effect of heat treatment on apple epicuticular wax and calcium uptake. *Postharvest Biology and Technology*. 8:271-277.

Ma, B.L., M. Li, L.M. Dwyer, and G. Stewart. 2004. Effect of in-season application methods of fertilizer nitrogen on grain yield and nitrogen use efficiency in maize. *Canadian Journal of Soil Science*. 84:169-176.

Ma, Q.F., N. Longnecker, and C. Atkins. 1998. Exogenous cytokinin and nitrogen do not increase grain yield in narrow-leafed lupins. *Crop Sci.* 38:717-721.

Macey, M.J.K. 1970. Effect of light on wax synthesis in leaves of *Brassica oleracea*. *Phytochemistry*. 9:757-761.

Majid, N.M., and T.M. Ballard. 1990. Effects of foliar application of copper-sulfate and urea on the growth of lodgepole pine. *Forest Ecology and Management*. 37:151-165.

Mallarino, A.P., M.U. Haq, D. Wittry, and M. Bermudez. 2001. Variation in soybean response to early season foliar fertilization among and within fields. *Agron. J.* 93:1220-1226.

Malusa, E., and L. Tosi. 2005. Phosphorous acid residues in apples after foliar fertilization: Results of field trials. *Food Additives and Contaminants*. 22:541-548.

Marentes, E., B.J. Shelp, R.A. Vanderpool, and G.A. Spiers. 1997. Retranslocation of boron in broccoli and lupin during early reproductive growth. *Physiol. Plant.* 100:389-399.

Marschner, H. 1995. Mineral Nutrition of Higher Plants. Academic Press, San Diego.

Marschner, P. 2012. Mineral Nutrition of Higher Plants. Academic Press, San Diego. 651 pp.

Masi, E., and M. Boselli. 2011. Foliar application of molybdenum: Effects on yield quality of the grapevine Sangiovese (*Vitis vinifera* L.). *Advances in Horticultural Science*. 25:37-43.

Mason, J.L., J.M. McDougald, and B.G. Drought. 1974. Calcium concentration in apple fruit resulting from calcium chloride dips modified by surfactants and thickeners. *Hortscience*. 9:122-123.

McBeath, T.M., M.J. McLaughlin, and S.R. Noack. 2011. Wheat grain yield response to and translocation of foliar-applied phosphorus. *Crop & Pasture Science*. 62:58-65.

Middleton, L.J., and J. Sanderson. 1965. Uptake of inorganic ions by plant leaves. *Journal of Experimental Botany*. 16:197.

Miller, P.C.H., and M.C. Butler Ellis. 2000. Effects of formulation on spray nozzle performance for applications fron ground-based boom sprayers. *Crop Protection*. 19:609-615.

Miwa, K., M. Tanaka, T. Kamiya, and T. Fujiwara. 2010. Molecular mechanisms of boron transport in plants: Involvement of arabidopsis nip5;1 and nip6;1. *Mips and Their Role in the Exchange of Metalloids*. 679:83-96.

Modaihsh, A.S. 1997. Foliar application of chelated and non-chelated metals for supplying micronutrients to wheat grown on calcareous soil. *Experimental Agriculture*. 33:237-245.

Monge, E., C. Perez, A. Pequerul, P. Madero, and J. Val. 1993. Effect of iron chlorosis on mineral-nutrition and lipid-composition of thylakoid biomembrane in *Prunus persica* L. bastch. *Plant and Soil*. 154:97-102.

Moran, K. 2004. Micronutrient product types and their development. *International Fertiliser Society*. Proceedings No. 545.

Morandi, B., L. Manfrini, P. Losciale, M. Zibordi, and L. Corelli-Grappadelli. 2010. The positive effect of skin transpiration in peach fruit growth. *Journal of Plant Physiology*. 167:1033-1037.

Mortvedt, J.J. 2001. Calculating salt index. *Fluid Journal*. Spring:1-3.

Mosali, J., K. Desta, R.K. Teal, K.W. Freeman, K.L. Martin, J.W. Lawles, and W.R. Raun. 2006. Effect of foliar application of phosphorus on winter wheat grain yield, phosphorus uptake, and use efficiency. *J. Plant Nutr.* 29:2147-2163.

Moustafa, O.K., Z.M. Elattal, and A.F. Doban. 1984. The role of foliar fertilizers in tolerance of the cotton leafworm to certain insecticides. *J. Agric. Sci.* 102:115-117.

Muhling, K.H., and A. Lauchli. 2000. Light-induced pH and K^+ changes in the apoplast of intact leaves. *Planta*. 212:9-15.

Mullins, G.L., and C.H. Burmester. 1990. Dry-matter, nitrogen, phosphorus, and potassium accumulation by 4 cotton varieties. *Agron. J.* 82:729-736.

Nable, R.O., J.G. Paull, and B. Cartwright. 1990. Problems associated with the use of foliar analysis for diagnosing boron toxicity in barley. *Plant and Soil*. 128:225-232.

Neilsen, G., D. Neilsen, S.F. Dong, P. Toivonen, and F. Peryea. 2005a. Application of $CaCl_2$ sprays earlier in the season may reduce bitter pit incidence in 'Braebum' apple. *Hortscience*. 40:1850-1853.

Neilsen, G.H., E.J. Hogue, D. Neilsen, and P. Bowen. 2005b. Postbloom humic- and fulvic-based zinc sprays can improve apple zinc nutrition. *Hortscience*. 40:205-208.

Neilsen, G.H., and P.B. Hoyt. 1984. Field comparison of chelated and epsom salt magnesium foliar sprays on apple-trees. *Hortscience*. 19:431-432.

Nelson, K.A., and C.G. Meinhardt. 2011. Foliar boron and pyraclostrobin effects on corn yield. *Agron. J.* 103:1352-1358.

Neumann, P., and R. Prinz. 1975. Enhancement of seedling establishment with foliar sprays. *Israel Journal of Botany*. 24:48-48.

Neumann, P.M. 1979. Rapid evaluation of foliar fertilizer-induced damage - N, P, K, S on corn. *Agron. J.* 71:598-602.

Neumann, P.M. 1982. Late-season foliar fertilization with macronutrients - is there a theoretical basis for increased seed yields? *J. Plant Nutr.* 5:1209-1215.

Neumann, P.M., and M. Giskin. 1979. Late season foliar fertilization of beans with NPKs - effects of cytokinins, calcium and spray frequency. *Commun. Soil Sci. Plant Anal.* 10:579-589.

Neumann, P.M., and R. Prinz. 1974. The effect of organo silicone surfactants in foliar nutrient sprays on increased adsorption of phosphate and iron salts through stomatal infiltration. *Israel Journal of Agricultural Research*. 23:123-128.

Nicoulaud, B.A.L., and A.J. Bloom. 1998. Nickel supplements improve growth when foliar urea is the sole nitrogen source for tomato. *Journal of the American Society for Horticultural Science*. 123:556-559.

Noack, S.R., T.M. McBeath, and M.J. McLaughlin. 2011. Potential for foliar phosphorus fertilisation of dryland cereal crops: A review. *Crop & Pasture Science*. 62:659-669.

Nobel, P.S. 1969. Light-dependent potassium uptake by *Pisum sativum* leaf fragments. *Plant and Cell Physiology*. 10:597-605.

Nobel, P.S. 1970. Relation of light-dependent potassium uptake by pea leaf fragments to PK of accompanying organic acid. *Plant Physiology*. 46:491-493.

Norris, R.F. 1974. Penetration of 2,4-D in relation to cuticle thickness. *American Journal of Botany*. 61:74-79.

Nowack, B., I. Schwyzer, and R. Schulin. 2008. Uptake of Zn and Fe by wheat (*Triticum aestivum* var. Greina) and transfer to the grains in the presence of chelating agents (ethylenediaminedisuccinic acid and ethylenediaminetetraacetic acid). *Journal of Agricultural and Food Chemistry*. 56:4643-4649.

Nuyttens, D., W.A. Taylor, S.B. De Schampheleire, P. Verboven, and D. Dekeyser. 2009. Influence of nozzle type and size on drift potential by means of different wind tunnel evaluation methods. *Biosystems Engineering*. 103:271-280.

Nuyttens, K., T.M. Baetens, and M.J. McLaughlin. 2007. Effect of nozzle type, size and pressure on spray droplet characteristics. *Biosystems Engineering*. 97:271-280.

Nyomora, A.M.S., P.H. Brown, and B. Krueger. 1999. Rate and time of boron application increase almond productivity and tissue boron concentration. *Hortscience*. 34:242-245.

Nyomora, A.M.S., P.H. Brown, K. Pinney, and V.S. Polito. 2000. Foliar application of boron to almond trees affects pollen quality. *Journal of the American Society for Horticultural Science*. 125:265-270.

Oosterhuis, D.M., and B.R. Bondada. 2001. Yield response of cotton to foliar nitrogen as influenced by sink strength, petiole, and soil nitrogen. *J. Plant Nutr.* 24:413-422.

Orbovic, V., D. Achor, P. Petracek, and J.P. Syvertsen. 2001. Air temperature, humidity, and leaf age affect penetration of urea through grapefruit leaf cuticles. *Journal of the American Society for Horticultural Science*. 126:44-50.

Orlovius, K. 2001. Effect of foliar fertilization with magnesium, sulfur, manganese and boron to sugar beet, oilseed rape, and cereals. *In* Plant Nutrition – Food Security and Sustainability of Agro-Ecosystem. W.J. Horst, editor. Kluwer, Dordrecht. 788-789.

Ozturk, L., M.A. Yazici, C. Yucel, A. Torun, C. Cekic, A. Bagci, H. Ozkan, H.J. Braun, Z. Sayers, and I. Cakmak. 2006. Concentration and localization of zinc during seed development and germination in wheat. *Physiol. Plant.* 128:144-152.

Palmer, C.M., and M.L. Guerinot. 2009. Facing the challenges of Cu, Fe and Zn homeostasis in plants. *Nat. Chem. Biol.* 5:333-340.

Pandey, N., G.C. Pathak, and C.P. Sharma. 2006. Zinc is critically required for pollen function and fertilisation in lentil. *Journal of Trace Elements in Medicine and Biology*. 20:89-96.

Pandey, N., G.C. Pathak, and C.P. Sharma. 2009. Impairment in reproductive development is a major factor limiting yield of black gram under zinc deficiency. *Biologia Plantarum*. 53:723-727.

Pang, J.Y., J. Ross, M.X. Zhou, N. Mendham, and S. Shabala. 2007. Amelioration of detrimental effects of waterlogging by foliar nutrient sprays in barley. *Functional Plant Biology*. 34:221-227.

Papadakis, I.E., E. Protopapadakis, I.N. Therios, and V. Tsirakoglou. 2005. Foliar treatment of Mn deficient 'Washington Navel' orange trees with two Mn sources. *Scientia Horticulturae*. 106:70-75.

Parker, M.B., and F.C. Boswell. 1980. Foliage injury, nutrient intake, and yield of soybeans as influenced by foliar fertilization. *Agron. J.* 72:110-113.

Parr, J.F. 1982. Toxicology of adjuvants. *In* Adjuvants and Herbicides. R.H. Hodgson, editor. Weed Science Society of America, Champaign, IL. 93-112.

Pearson, J.N., and Z. Rengel. 1994. Distribution and remobilization of Zn and Mn during grain development in wheat. *Journal of Experimental Botany*. 45:1829-1835.

Pearson, J.N., Z. Rengel, C.F. Jenner, and R.D. Graham. 1995. Transport of zinc and manganese to developing wheat grains. *Physiol. Plant.* 95:449-455.

Penner, D. 2000. Activator adjuvants. *Weed Technology*. 14:785-791.

Perica, S., P.H. Brown, J.H. Connell, A.M.S. Nyomora, C. Dordas, H.N. Hu, and J. Stangoulis. 2001. Foliar boron application improves flower fertility and fruit set of olive. *Hortscience*. 36:714-716.

Peryea, F.J. 2006. Phytoavailability of zinc in postbloom zinc sprays applied to 'Golden Delicious' apple trees. *Horttechnology*. 16:60-65.

Peryea, F.J. 2007. Comparison of dormant and circum-bloom zinc spray programs for washington apple orchards. *J. Plant Nutr.* 30:1903-1920.

Peryea, F.J., D. Neilsen, and G. Neilsen. 2003. Boron maintenance sprays for apple: Early-season applications and tank-mixing with calcium chloride. *Hortscience*. 38:542-546.

Peryea, F.J., G.H. Neilsen, and D. Faubion. 2007. Start-timing for calcium chloride spray programs influences fruit calcium and bitter pit in 'Braeburn' and 'Honeycrisp' apples. *J. Plant Nutr.* 30:1213-1227.

Pfündel, E.E., G. Agati, and Z.G. Cerovic. 2006. Optical properties of plant surfaces. *In* Biology of the Cuticle. Vol. 23. M. Riederer and C. Muller, editors. Blackwell, Oxford. 216-249.

Phillips, S.B., and G.L. Mullins. 2004. Foliar burn and wheat grain yield responses following topdress-applied nitrogen and sulfur fertilizers. *J. Plant Nutr.* 27:921-930.

Picchioni, G.A., and S.A. Weinbaum. 1995. Retention and the kinetics of uptake and export of foliage-applied, labeled boron by apple, pear, prune, and sweet cherry leaves. *Journal of the American Society for Horticultural Science*. 120:28-35.

Poole, W.D., G.W. Randall, and G.E. Ham. 1983a. Foliar fertilization of soybeans. 1. Effect of fertilizer sources, rates, and frequency of application. *Agron. J.* 75:195-200.

Poole, W.D., G.W. Randall, and G.E. Ham. 1983b. Foliar fertilization of soybeans. 2. Effect of biuret and application time of day. *Agron. J.* 75:201-203.

Popp, C., M. Burghardt, A. Friedmann, and M. Riederer. 2005. Characterization of hydrophilic and lipophilic pathways of *Hedera helix* L. Cuticular membranes: Permeation of water and uncharged organic compounds. *Journal of Experimental Botany*. 56:2797-2806.

Porro, D., C. Dorigatti, M. Stefanini, M. Policarpo, F. Camin, and L. Ziller. 2006. Foliar nitrogen composition and application timing influence nitrogen uptake by, as well as partitioning within, two grapevine cultivars. *Acta Horticulturae*. 721:245-250.

Prior, S.A., S.G. Pritchard, G.B. Runion, H.H. Rogers, and R.J. Mitchell. 1997. Influence of atmospheric CO_2 enrichment, soil N, and water stress on needle surface wax formation in *Pinus palustris* (pinaceae). *American Journal of Botany*. 84:1070-1077.

Pushman, F.M., and J. Bingham. 1976. Effects of a granular nitrogen-fertilizer and a foliar spray of urea on yield and bread-making quality of 10 winter wheats. *J. Agric. Sci.* 87:281-292.

Rabe, E. 1994. Yield benefits associated with pre-blossom low-biuret urea sprays on *Citrus spp*. *Journal of Horticultural Science*. 69:495-500.

Rains, D.W. 1968. Kinetics and energetics of light-enhanced potassium absorption by corn leaf tissue. *Plant Physiology*. 43:394-&400.

Ramos, D., G. McGranahan, and L. Hendricks. 1984. Walnuts. *Fruit Varieties Journal*. 38:112-120.

Ramsey R. J. L., S.G.R., Hall, J. C. . 2005. A review of the effects of humidity, humectants, and surfactnant composition on the absorption and efficacy of highly water-soluble herbicides. *Pesticide Biochemistry and Physiology 82*:162-175.

Rathore, V.S., S.H. Wittwer, W.H. Jyung, Y.P.S. Bajaj, and M.W. Adams. 1970. Mechanism of zinc uptake in bean (*Phaseolus vulgaris*) tissues. *Physiol. Plant.* 23:908-919.

Ratjen, A.M., and J. Gerendas. 2009. A critical assessment of the suitability of phosphite as a source of phosphorus. *Journal of Plant Nutrition and Soil Science-Zeitschrift für Pflanzenernahrung und Bodenkunde*. 172:821-828.

Raven, J.A. 1971. Effects of visible light on influx and efflux of solutes in plant cells. *Chemistry & Industry*:859-866.

Reed, D.W., C.G. Lyons, and G.R. McEachern. 1988. Field-evaluation of inorganic and chelated iron fertilizers as foliar sprays and soil application. *J. Plant Nutr.* 11:1369-1378.

Reed, D.W., and H.B. Tukey. 1978. Effect of pH on foliar absorption of rubidium compounds by chrysanthemum. *Journal of the American Society for Horticultural Science*. 103:815-817.

Reed, D.W., and H.B. Tukey. 1982. Light-intensity and temperature effects on epicuticular wax morphology and internal cuticle ultrastructure of carnation and brussels-sprouts leaf cuticles. *Journal of the American Society for Horticultural Science*. 107:417-420.

Reickenberg, R.L., and M.P. Pritts. 1996. Dynamics of nutrient uptake from foliar fertilizers in red raspberry (*Rubles idaeus* L). *Journal of the American Society for Horticultural Science*. 121:158-163.

Rerkasem, B., and S. Jamjod. 2004. Boron deficiency in wheat: A review. *Field Crops Research*. 89:173-186.

Restrepo-Diaz, H., M. Benlloch, and R. Fernandez-Escobar. 2008a. Plant water stress and K^+ starvation reduce absorption of foliar applied K^+ by olive leaves. *Scientia Horticulturae*. 116:409-413.

Restrepo-Diaz, H., M. Benlloch, and R. Fernandez-Escobar. 2009. Leaf potassium accumulation in olive plants related to nutritional K status, leaf age, and foliar application of potassium salts. *J. Plant Nutr.* 32:1108-1121.

Restrepo-Diaz, H., M. Benlloch, C. Navarro, and R. Fernandez-Escobar. 2008b. Potassium fertilization of rainfed olive orchards. *Scientia Horticulturae*. 116:399-403.

Reuveni, M., and R. Reuveni. 1998a. Foliar applications of mono-potassium phosphate fertilizer inhibit powdery mildew development in nectarine trees. *Canadian Journal of Plant Pathology-Revue Canadienne De Phytopathologie*. 20:253-258.

Reuveni, R., and M. Reuveni. 1998b. Foliar-fertilizer therapy - a concept in integrated pest management. *Crop Protection*. 17:111-118.

Rhee, K.H., E.P. Morriss, J. Barber, and W. Kuhlbrandt. 1998. Three-dimensional structure of the plant photosystem ii reaction centre at 8 angstrom resolution. *Nature*. 396:283-286.

Riceman, D.S., and G.B. Jones. 1958. Distribution of zinc and copper in subterranean clover (*Trifolium subterraneum* L.) grown in culture solutions supplied with graduated amounts of zinc. *Australian Jour Agric Res*. 9:73-122.

Riceman, D.S., and G.B. Jones. 1960. Distribution of recently absorbed zinc in subterranean clover (*Trifolium subterraneum* L.), determined by adding radioactive zinc to the culture solution. *Australian Jour Agric Res*. 2:887-893.

Riederer, M. 1995. Partitioning and transport of organic chemicals between the atmospheric environment and leaves. *In* Plant Contamination. Modeling and Simulation of Organic Chemical Processes. S. Trapp, J.C. McFarlane, editors. Lewis Publishers, Boca Raton. 153-190.

Riederer, M., and A. Friedmann. 2006. Transport of lipophilic non-electrolytes across the cuticle. *In* Biology of the Plant Cuticle. Vol. 23. M. Riederer and C. Muller, editors. Blackwell Publishing, 9600 Garsington Rd, Oxford, Oxen, UK. 250-279.

Riederer, M., and L. Schreiber. 2001. Protecting against water loss: Analysis of the barrier properties of plant cuticles. *Journal of Experimental Botany*. 52:2023-2032.

Robbertse, P.J., J.J. Lock, E. Stoffberg, and L.A. Coetzer. 1990. Effect of boron on directionality of pollen-tube growth in petunia and agapanthus. *South African Journal of Botany*. 56:487-492.

Robertson, D., H.P. Zhang, J.A. Palta, T. Colmer, and N.C. Turner. 2009. Waterlogging affects the growth, development of tillers, and yield of wheat through a severe, but transient, N deficiency. *Crop & Pasture Science*. 60:578-586.

Rodney, D.R. 1952. The entrance of nitrogen compounds through the epidermis of apple leaves. *Proc Amer Soc Hort Sci*. 59:99-102.

Rombola, A.D., W. Bruggemann, M. Tagliavini, B. Marangoni, and P.R. Moog. 2000. Iron source affects iron reduction and re-greening of kiwifruit (*Actinidia deliciosa*) leaves. *J. Plant Nutr.* 23:1751-1765.

Rose, T.J., Z. Rengel, Q. Ma, and J.W. Bowden. 2007. Differential accumulation patterns of phosphorus and potassium by canola cuffivars compared to wheat. *Journal of Plant Nutrition and Soil Science-Zeitschrift für Pflanzenernahrung und Bodenkunde*. 170:404-411.

Rosecrance, R.C., R.S. Johnson, and S.A. Weinbaum. 1998a. The effect of timing of post-harvest foliar urea sprays on nitrogen absorption and partitioning in peach and nectarine trees. *Journal of Horticultural Science & Biotechnology*. 73:856-861.

Rosecrance, R.C., S.A. Weinbaum, and P.H. Brown. 1996. Assessment of nitrogen, phosphorus, and potassium uptake capacity and root growth in mature alternate-bearing pistachio (*Pistacia vera*) trees. *Tree Physiology*. 16:949-956.

Rosecrance, R.C., S.A. Weinbaum, and P.H. Brown. 1998b. Alternate bearing affects nitrogen, phosphorus, potassium and starch storage pools in mature pistachio trees. *Annals of Botany*. 82:463-470.

Rosen, C.J., P.M. Bierman, A. Telias, and E.E. Hoover. 2006. Foliar- and fruit-applied strontium as a tracer for calcium transport in apple trees. *Hortscience*. 41:220-224.

Samuels, L., L. Kunst, and R. Jetter. 2008. Sealing plant surfaces: Cuticular wax formation by epidermal cells. *Annual Review of Plant Biology*. Vol. 59. 683-707.

Sanchez, E.E., and T.L. Righetti. 1990. Tree nitrogen status and leaf canopy position influence postharvest nitrogen accumulation and efflux from pear leaves. *Journal of the American Society for Horticultural Science*. 115:934-937.

Sanchez, E.E., and T.L. Righetti. 2005. Effect of postharvest soil and foliar application of boron fertilizer on the partitioning of boron in apple trees. *Hortscience*. 40:2115-2117.

Sanchez, E.E., T.L. Righetti, D. Sugar, and P.B. Lombard. 1990. Response of Comice pear trees to a postharvest urea spray. *Journal of Horticultural Science*. 65:541-546.

Sanchez, E.E., S.A. Weinbaum, and R.S. Johnson. 2006. Comparative movement of labelled nitrogen and zinc in 1-year-old peach *Prunus persica* L. batsch trees following late-season foliar application. *Journal of Horticultural Science & Biotechnology*. 81:839-844.

Santos, C.H., J. Duarte Filho, J.C. Modesto, and G. Ferreira. 1999. Adubos foliares quelatizados e sais na absorção de boro, manganês e zinco em laranjeira 'pera'. *Scientia Agricola*. 56:999-1004.

Sanz, A., C. Monerri, J. Gonzalezferrer, and J.L. Guardiola. 1987. Changes in carbohydrates and mineral elements in citrus leaves during flowering and fruit-set. *Physiol. Plant.* 69:93-98.

Sargent, J.A., and G.E. Blackman. 1962. Studies on foliar penetration. 1. Factors controlling entry of 2,4-dichlorophenoxyacetic acid. *Journal of Experimental Botany*. 13:348-368.

Sartori, R.H., A.E. Boaretto, F.C. Alvarez Villanueva, and H.M. Gimenes Fernandes. 2008. Foliar and radicular absorption of ^{65}Zn and its redistribution in citrus plant. *Revista Brasileira De Fruticultura*. 30:523-527.

Scagel, C.F., G.H. Bi, L.H. Fuchigami, and R.P. Regan. 2008. Rate of nitrogen application during the growing season and spraying plants with urea in the autumn alters uptake of other nutrients by deciduous and evergreen container-grown rhododendron cultivars. *Hortscience*. 43:1569-1579.

Schlegel, T.K., and J. Schönherr. 2002. Stage of development affects penetration of calcium chloride into apple fruits. *Journal of Plant Nutrition and Soil Science-Zeitschrift für Pflanzenernahrung und Bodenkunde*. 165:738-745.

Schlegel, T.K., J. Schönherr, and L. Schreiber. 2005. Size selectivity of aqueous pores in stomatous cuticles of *Vicia faba* leaves. *Planta*. 221:648-655.

Schlegel, T.K., J. Schönherr, and L. Schreiber. 2006. Rates of foliar penetration of chelated Fe(III): Role of light, stomata, species, and leaf age. *Journal of Agricultural and Food Chemistry*. 54:6809-6813.

Schmitz-Eiberger, M.A., R. Haefs, and G.J. Noga. 2002. Enhancing biological efficacy and rainfastness of foliar applied calcium chloride solutions by addition of rapeseed oil surfactants. *Journal of Plant Nutrition and Soil Science*. 165:634-639.

Schmucker, T. 1934. Über den Einfluß von Borsäure auf Pflanzen, insbesondere keimende Pollenkörner. *Planta*. 23:264-283.

Schönherr, J. 1976. Water permeability of isolated cuticular membranes - effect of pH and cations on diffusion, hydrodynamic permeability and size of polar pores in cutin matrix. *Planta*. 128:113-126.

Schönherr, J. 2000. Calcium chloride penetrates plant cuticles via aqueous pores. *Planta*. 212:112-118.

Schönherr, J. 2001. Cuticular penetration of calcium salts: Effects of humidity, anions, and adjuvants. *Journal of Plant Nutrition and Soil Science-Zeitschrift für Pflanzenernahrung und Bodenkunde*. 164:225-231.

Schönherr, J. 2006. Characterization of aqueous pores in plant cuticles and permeation of ionic solutes. *Journal of Experimental Botany*. 57:2471-2491.

Schönherr, J., and P. Baur. 1994. Modeling penetration of plant cuticles by crop protection agents and effects of adjuvants on their rates of penetration. *Pesticide Science*. 42:185-208.

Schönherr, J., and M.J. Bukovac. 1972. Penetration of stomata by liquids - dependence on surface-tension, wettability, and stomatal morphology. *Plant Physiology*. 49:813-819.

Schönherr, J., and M.J. Bukovac. 1978. Foliar penetrations of succininc acid 2,2 dimethylhydrazide - mechanism and rate limiting step. *Physiol. Plant*. 42:243-251.

Schönherr, J., V. Fernández, and L. Schreiber. 2005. Rates of cuticular penetration of chelated Fe(III): Role of humidity, concentration, adjuvants, temperature, and type of chelate. *Journal of Agricultural and Food Chemistry*. 53:4484-4492.

Schönherr, J., and R. Huber. 1977. Plant cuticles are polyelectrolytes with isoelectric points around 3. *Plant Physiology*. 59:145-150.

Schönherr, J., and M. Luber. 2001. Cuticular penetration of potassium salts: Effects of humidity, anions, and temperature. *Plant and Soil*. 236:117-122.

Schönherr, J., and M. Riederer. 1988. Desorption of chemicals from plant cuticles - evidence for asymmetry. *Archives of Environmental Contamination and Toxicology*. 17:13-19.

Schönherr, J., and L. Schreiber. 2004. Size selectivity of aqueous pores in astomatous cuticular membranes isolated from *Populus canescens* (aiton) sm. leaves. *Planta*. 219:405-411.

Schreiber, L. 2005. Polar paths of diffusion across plant cuticles: New evidence for an old hypothesis. *Annals of Botany*. 95:1069-1073.

Schreiber, L. 2006. Review of sorption and diffusion of lipophilic molecules in cuticular waxes and the effects of accelerators on solute mobilities. *Journal of Experimental Botany*. 57:2515-2523.

Schreiber, L., and J. Schönherr. 2009. Water and solute permeability of plant cuticles: Measurement and data analysis. Springer Verlag, Berlin, Heidelberg, Germany.

Schreiner, R.P. 2010. Foliar sprays containing phosphorus (P) have minimal impact on 'Pinot Noir' growth and P status, mycorrhizal colonization, and fruit quality. *Hortscience*. 45:815-821.

Seymour, M., and R.F. Brennan. 1995. Nutrient sprays applied to the foliage of narrow-leafed lupins (*Lupinus angustifolius* L.) during flowering and podding do not increase seed yield. *Australian Journal of Experimental Agriculture*. 35:381-385.

Shaheen, M.A., N.W. Miles, and G.L. Kreitner. 1981. Lenticel origin on Golden Delicious apple fruits. *Fruit Varieties Journal*. 35:134-136.

Sharma, P.N., C. Chatterjee, S.C. Agarwala, and C.P. Sharma. 1990. Zinc-deficiency and pollen fertility in maize (*Zea mays*). *Plant and Soil*. 124:221-225.

Sharples, G.C., and R.H. Hilgeman. 1972. Leaf mineral composition of 5 citrus cultivars grown on sour orange and rough lemon rootstocks. *Journal of the American Society for Horticultural Science*. 97:427-430.

Shaw, G.B., R.B. McKercher, and R. Ashford. 1997. The effect of spray volume on spray partitioning between plant and soil. *Plant and Soil*. 100:323-331.

Shazly, S.A. 1986. The effect of amino acid chelated minerals in correcting mineral deficiencies and increasing fruit production in Egypt. *In* Foliar Feeding of Plants with Amino Acid Chelates. H. De Wayne Ashmead, editor. Noyes Pub., Park Ridge, NJ. 236-254.

Shelp, B.J. 1988. Boron mobility and nutrition in broccoli (*Brassica oleracea* var italica). *Annals of Botany*. 61:83-91.

Shelp, B.J., P. Vivekanandan, R.A. Vanderpool, and A.M. Kitheka. 1996. Translocation and effectiveness of foliar-fertilized boron in broccoli plants of varying boron status. *Plant and Soil*. 183:309-313.

Shi, R.L., R. Bassler, C.Q. Zou, and V. Romheld. 2011. Is iron phloem mobile during senescence in trees? A reinvestigation of Rissmuller's finding of 1874. *Plant Physiology and Biochemistry*. 49:489-493.

Shim, K.K., J.S. Titus, and Splittstoesser W.E. 1972. Utilization of post-harvest urea sprays by senescing apple leaves. *Journal of the American Society for Horticultural Science*. 97:592-596.

Simoglou, K.B., and C. Dordas. 2006. Effect of foliar applied boron, manganese and zinc on tan spot in winter durum wheat. *Crop Protection*. 25:657-663.

Singh, A.L., and D. Dayal. 1992. Foliar application of iron for recovering groundnut plants from lime-induced iron-deficiency chlorosis and accompanying losses in yields. *J. Plant Nutr.* 15:1421-1433.

Smith, M.W., and J.B. Storey. 1979. Zinc concentration of pecan leaflets and yield as influenced by zinc source and adjuvants. *Journal of the American Society for Horticultural Science*. 104:474-477.

Sonmez, S., M. Kaplan, N.K. Sonmez, H. Kaya, and I. Uz. 2006. High level of copper application to soil and leaves reduce the growth and yield of tomato plants. *Scientia Agricola*. 63:213-218.

Southwick, S.M., W. Olson, J. Yeager, and K.G. Weis. 1996. Optimum timing of potassium nitrate spray applications to 'French' prune trees. *Journal of the American Society for Horticultural Science*. 121:326-333.

Sparks, D. 1986. Growth and nutrition of pecan seedlings from potassium phosphate foliar sprays. *Hortscience*. 21:451-453.

Stangoulis, J., P. Brown, N. Bellaloui, R. Reid, and R. Graham. 2001. The efficiency of boron utilisation in canola. *Australian Journal of Plant Physiology*. 28:1109-1114.

Stangoulis, J., M. Tate, R. Graham, M. Bucknall, L. Palmer, B. Boughton, and R. Reid. 2010. The mechanism of boron mobility in wheat and canola phloem. *Plant Physiology*. 153:876-881.

Steiner, C., M.F. Destain, B. Schiffere, and F. Lebeau. 2006. Droplet size spectra and drift effect of two phenmediapham formulations and four adjuvant mixtures. *Crop Protection*. 25:1238-1243.

Stevens, P.J.G. 1993. Organosilicone surfactants as adjuvants for agrochemicals. *Pesticide Science*. 38:103-122.

Stock, D., and P.J. Holloway. 1993. Possible mechanisms for surfactant-induced foliar uptake of agrochemicals. *Pesticide Science*. 38:165-177.

Strik, B., T. Righetti, and G. Buller. 2004. Influence of rate, timing, and method of nitrogen fertilizer application on uptake and use of fertilizer nitrogen, growth, and yield of June-bearing strawberry. *Journal of the American Society for Horticultural Science*. 129:165-174.

Swader, J.A., C.R. Stocking, and C.H. Lin. 1975. Light-stimulated absorption of nitrate by *Wolffia arrhiza*. *Physiol. Plant.* 34:335-341.

Swietlik, D. 2002. Zinc nutrition of fruit crops. *Horttechnology*. 12:45-50.

Swietlik, D., J.A. Bunce, and S.S. Miller. 1984. Effect of foliar application of mineral nutrients on stomatal aperture and photosynthesis in apple seedlings. *Journal of the American Society for Horticultural Science*. 109:306-312.

Swietlik, D., and M. Faust. 1984. Foliar nutrition of fruit crops. *In* Janick, J. 287-356.

Swietlik, D., and J.V. Laduke. 1991. Productivity, growth, and leaf mineral-composition of orange and grapefruit trees foliar-sprayed with zinc and manganese. *J. Plant Nutr.* 14:129-142.

Syverud, T.D., L.M. Walsh, E.S. Oplinger, and K.A. Kelling. 1980. Foliar fertilization of soybeans (*Glycine max* L.). *Commun. Soil Sci. Plant Anal.* 11:637-651.

Tadros, T.F. 1995. Physical chemistry of surfactant solutions. *In* Surfactants in Agrochemicals. J. Cross, editor. Marcel Deker, New York. 7-29.

Tagliavini, M., J. Abadia, A.D. Rombola, A. Abadia, C. Tsipouridis, and B. Marangoni. 2000. Agronomic means for the control of iron deficiency chlorosis in deciduous fruit trees. *J. Plant Nutr.* 23:2007-2022.

Tagliavini, M., P. Millard, and M. Quartieri. 1998. Storage of foliar-absorbed nitrogen and remobilization for spring growth in young nectarine (*Prunus persica* var. Nectarina) trees. *Tree Physiology*. 18:203-207.

Takeoka, Y., K. Kondo, and P.B. Kaufman. 1983. Leaf surface fine-structures in rice plants cultured under shaded, and non-shaded conditions. *Japanese Journal of Crop Science*. 52:534-543.

Taylor, W.A., A.R. Womac, P.C.H. Miller, and B.P. Taylor. 2004. An attempt to relate drop size to drift risk. Proceedings of the International Conference on Pesticide Application for Drift Management. 210-223.

Thalheimer, M., and N. Paoli. 2002. Influence of foliar nutrient spray concentrations on leaf absorption and phytotoxicity in apple. *Acta Horticulturae*. 594:595-600.

Tisdale, S.L., and W.L. Nelson. 1975. Soil fertility and fertilizers. MacMillan, New York.

Tomar, J.S., A.F. Mackenzie, G.R. Mehuys, and I. Alli. 1988. Corn growth with foliar nitrogen, soil-applied nitrogen, and legume intercrops. *Agron. J.* 80:802-807.

Toselli, M., M. Thalheimer, and M. Tagliavini. 2004. Leaf uptake and subsequent partitioning of urea-N as affected by the concentration and volume of spray solution and by the shoot leaf position in apple (*Malus domestica*) trees. *Journal of Horticultural Science & Biotechnology*. 79:97-100.

Tosi, L., and E. Malusa. 2002. Phosphate foliar fertilization as source of phosphite residues. *Acta Horticulturae*. 594:283-287.

Tuck, C.R., M.C. Butler Ellis, and P.C.H. Miller. 1997. Techniques for measurement of droplet size and velocity distributions in agricultural sprays. *Crop Protection*. 16:619-628.

Tukey, H.B., M.J. Bukovac, and S.H. Wittwer. 1961. Absorption of radionuclides by aboveground plant parts and movement within plant. *Journal of Agricultural and Food Chemistry*. 9:106-112.

Turgeon, R. 2006. Phloem loading: How leaves gain their independence. *Bioscience*. 56:15-24.

Turley, R.H., and T.M. Ching. 1986. Physiological-responses of barley leaves to foliar applied urea-ammonium nitrate. *Crop Sci.* 26:987-993.

Turrell, F.M. 1947. Citrus leaf stomata - structure, composition, and pore size in relation to penetration of liquids. *Botanical Gazette*. 108:476-483.

Tyree, M.T., T.D. Scherbatskoy, and C.A. Tabor. 1990. Leaf cuticles behave as asymmetric membranes - evidence from the measurement of diffusion potentials. *Plant Physiology*. 92:103-109.

Tyree, M.T., C.R. Wescott, C.A. Tabor, and A.D. Morse. 1992. Diffusion and electric mobility of KCl within isolated cuticles of *Citrus aurantium*. *Plant Physiology*. 99:1057-1061.

Uhlig, B.A., and A.H. Wissemeier. 2000. Reduction of non-ionic surfactant phytotoxicity by divalent cations. *Crop Protection*. 19:13-19.

Val, J., and V. Fernandez. 2011. In-season calcium-spray formulations improve calcium balance and fruit quality traits of peach. *Journal of Plant Nutrition and Soil Science*. 174:465-472.

Valkama, E., J.P. Salminen, J. Koricheva, and K. Pihlaja. 2004. Changes in leaf trichomes and epicuticular flavonoids during leaf development in three birch taxa. *Annals of Botany*. 94:233-242.

van de Zande, J.C., H.J. Holterman, and M. Wenneker. 2008a. Nozzle classification for drift reduction in orchard spraying: Identification of drift reduction class threshold nozzles. *Agricultural Engineering International: the CIGR Ejournal Manuscript ALNARP 08 0013*.

van de Zande, J.C., J.F.M. Huijsmans, H.A.J. Porskamp, J.M.G.P. Michielsen, H. Stallinga, H.J. Holterman, and A. de Jong. 2008b. Spray techniques: How to optimise spray deposition and minimise spray drift? *Environmentalist*. 28:9-17.

Van Goor, B.J. 1973. Penetration of surface applied calcium-45 into apple fruit. *Journal of Horticultural Science*. 48:261-270.

Van Goor, B.J., and D. Wiersma. 1976. Chemical forms of manganese and zinc in phloem exudates. *Physiol. Plant.* 36:213-216.

Varga, B., and Z. Svecnjak. 2006. The effect of late-season urea spraying on grain yield and quality of winter wheat cultivars under low and high basal nitrogen fertilization. *Field Crops Research*. 96:125-132.

Villena, J.F., E. Dominguez, D. Stewart, and A. Heredia. 1999. Characterization and biosynthesis of non-degradable polymers in plant cuticles. *Planta*. 208:181-187.

Wagner, G.J., E. Wang, and R.W. Shepherd. 2004. New approaches for studying and exploiting an old protuberance, the plant trichome. *Annals of Botany*. 93:3-11.

Wagner, P., R. Furstner, W. Barthlott, and C. Neinhuis. 2003. Quantitative assessment to the structural basis of water repellency in natural and technical surfaces. *Journal of Experimental Botany*. 54:1295-1303.

Walker, D.R., and E.G. Fisher. 1955. Foliar sprays of urea on sour cherry trees. *Proc Amer Soc Hort Sci*. 66:21-27.

Wang, C.J., and Z.Q. Liu. 2007. Foliar uptake of pesticides - present status and future challenge. *Pesticide Biochemistry and Physiology*. 87:1-8.

Waters, B.M., and R.P. Sankaran. 2011. Moving micronutrients from the soil to the seeds: Genes and physiological processes from a biofortification perspective. *Plant Science*. 180:562-574.

Weichert, H., and M. Knoche. 2006a. Studies on water transport through the sweet cherry fruit surface. 10. Evidence for polar pathways across the exocarp. *Journal of Agricultural and Food Chemistry*. 54:3951-3958.

Weichert, H., and M. Knoche. 2006b. Studies on water transport through the sweet cherry fruit surface. 11. $FeCl_3$ decreases water permeability of polar pathways. *Journal of Agricultural and Food Chemistry*. 54:6294-6302.

Weinbaum, S. 1988. Foliar nutrition in fruit trees. *In* Plant Growth and Leaf Applied Chemicals. P.M. Neumann, editor. CRC Press, Boca Raton. 81-100.

Werker, E. 2000. Trichome diversity and development. *Advances in Botanical Research Incorporating Advances in Plant Pathology, Vol 31 2000*. 31:1-35.

White, P.J., and M.R. Broadley. 2003. Calcium in plants. *Annals of Botany*. 92:487-511.

White, P.J., and M.R. Broadley. 2009. Biofortification of crops with seven mineral elements often lacking in human diets - iron, zinc, copper, calcium, magnesium, selenium and iodine. *New Phytologist*. 182:49-84.

Will, S., T. Eichert, V. Fernandez, J. Moehring, T. Mueller, and V. Roemheld. 2011. Absorption and mobility of foliar-applied boron in soybean as affected by plant boron status and application as a polyol complex. *Plant and Soil*. 344:283-293.

Williams, C.M.J., N.A. Maier, and L. Bartlett. 2004. Effect of molybdenum foliar sprays on yield, berry size, seed formation, and petiolar nutrient composition of "Merlot" grapevines. *J. Plant Nutr.* 27:1891-1916.

Wimmer, M.A., K.H. Muhling, A. Lauchli, P.H. Brown, and H.E. Goldbach. 2003. The interaction between salinity and boron toxicity affects the subcellular distribution of ions and proteins in wheat leaves. *Plant Cell and Environment*. 26:1267-1274.

Witte, C.P. 2011. Urea metabolism in plants. *Plant Science*. 180:431-438.

Wittwer, S.H., M.J. Bukovac, W.H. Jyung, Y. Yamada, R. De, Rasmussen H.P., Haile Mariam S.N., and S. Kannan. 1967. Foliar absorption - penetration of cuticular membrane and nutrient uptake by isolated leaf cells. *Qualitas Plantarum Et Materiae Vegetabiles*. 14:105-120.

Wittwer, S.H., and F.G. Teubner. 1959. Foliar absorption of mineral nutrients. *Annu. Rev. Plant Physiol. Plant Molec. Biol.* 10:13-32.

Witty, J.F., R.J. Roughley, and J.M. Day. 1980. Reduction of yield of *Vicia faba* by foliar fertilization during the seed-filling period. *J. Agric. Sci.* 94:741-743.

Wojcik, P. 2004. Uptake of mineral nutrients from foliar fertilization - (review). *Journal of Fruit and Ornamental Plant Research*. 12:201-218.

Wojcik, P., and M. Wojcik. 2006. Effect of boron fertilization on sweet cherry tree yield and fruit quality. *J. Plant Nutr.* 29:1755-1766.

Woolfolk, C.W., W.R. Raun, G.V. Johnson, W.E. Thomason, R.W. Mullen, K.J. Wynn, and K.W. Freeman. 2002. Influence of late-season foliar nitrogen applications on yield and grain nitrogen in winter wheat. *Agron. J.* 94:429-434.

Xia, G.H., and L.L. Cheng. 2004. Foliar urea application in the fall affects both nitrogen and carbon storage in young 'Concord' grapevines grown under a wide range of nitrogen supply. *Journal of the American Society for Horticultural Science*. 129:653-659.

Yamada, Y., M.J. Bukovac, and S.H. Wittwer. 1964a. Penetration of ions through isolated cuticles. *Plant Physiology*. 39:28.

Yamada, Y., S.H. Wittwer, and M.J. Bukovac. 1964b. Penetration of organic compounds through isolated cuticles with special reference to urea. *Plant Physiology*. 39:R11.

Yildirim, E., I. Guvenc, M. Turan, and A. Karatas. 2007. Effect of foliar urea application on quality, growth, mineral uptake and yield of broccoli (*Brassica oleracea* L., var. Italica). *Plant Soil and Environment*. 53:120-128.

Young, K. 1979. Binding-energy in model classical field-theories. *Nuclear Physics B*. 158:77-101.

Zabkiewicz, J.A. 2002. Adjuvants and herbicidal efficacy – present status and future prospects. *Weed Research*. 40:139-149.

Zaragoza, S., C. Gazzola, I. Trenor, E. Alonso, E. Primo-Milo, V. Almela, M. Juan, and M. Agusti. 1996. Control of peel pitting of "Fortune" mandarin. *Proc. Int. Soc. Citriculture*:1105-1109.

Zhang, Q.L., and P.H. Brown. 1999a. Distribution and transport of foliar applied zinc in pistachio. *Journal of the American Society for Horticultural Science*. 124:433-436.

Zhang, Q.L., and P.H. Brown. 1999b. The mechanism of foliar zinc absorption in pistachio and walnut. *Journal of the American Society for Horticultural Science*. 124:312-317.

Zhang, Y., R. Shi, K.M. Rezaul, F. Zhang, and C. Zou. 2010. Iron and zinc concentrations in grain and flour of winter wheat as affected by foliar application. *Journal of Agricultural and Food Chemistry*. 58:12268-12274.