

Extended Abstract

Genetic Tolerance in *Capsicum Chinense* to Low pH Constraints on Root Growth [†]

Minguo Li ^{1,*} and Stephen Harper ²

¹ School of Agriculture and Food Sciences, the University of Queensland, Gatton 4343, Australia

² Gatton Research Facility, Queensland Department of Agriculture and Fisheries, Gatton 4343, Australia; Stephen.Harper@daf.qld.gov.au

* Correspondence: minguo.li@uq.edu.au

[†] Presented at the third International Tropical Agriculture Conference (TROPAG 2019), Brisbane, Australia, 11–13 November 2019.

Published: 12 January 2020

Peppers (*Capsicum* spp.) are valuable cash crops in developing countries of the tropics and sub-tropics where acidic soils represent a substantial amount of arable land. The optimal soil pH for pepper production is about 6.0 to 7.5 and soil acidity causes significant production losses. Soil acidification is aggravated by high inorganic nitrogen fertiliser input which is a critical component in maximising pepper yields. Application of lime can effectively amend the pH but it is a major cost to poor farmers in developing countries. The opportunity to identify pepper genotypes with resistance to low pH can reduce production costs whilst increasing yield.

A glasshouse solution culture experiment was conducted to investigate the effects of pH on root elongation of two commercial cultivars Warlock and Plato (*C. annuum*) and eight wild chilli accessions (*C. chinense*). The experimental design was a randomised complete block with six pH treatments (6.0, 5.4, 5.1, 4.8, 4.5 and 4.2) and three replicates. After germinating seeds in a rolled-towel, the plants were transplanted to 30-L plastic containers containing dilute nutrient solution when the average radicle length was 25–40 mm. At 14 days after transplanting the length of the longest root was determined individually. Root elongation was expressed relative to that in the pH 6.0 treatment.

The relative root length of three wild accessions was substantially greater than that of the commercial cultivars at pH 4.8 to 4.2. Two wild accessions had considerably higher mean root lengths than that of Warlock and Plato at pH 4.5 and 4.2.



© 2020 by the authors. Licensee MDPI, Basel, Switzerland. This article is an open access article distributed under the terms and conditions of the Creative Commons Attribution (CC BY) license (<http://creativecommons.org/licenses/by/4.0/>).