

High pH soils a problem for durums

In an effort to increase durum yields and extend the range where this crop can be grown varieties with better tolerances to salinity and boron toxicities are being produced.

“The outcomes from this work are just beginning to materialise with the release of the boron tolerant variety, Kalka, and the first field testing of lines with improved salt tolerance in 2003,” David Cooper of the University of Adelaide said.

Now he believes that tolerance to high soil pH levels also needs to be added to the durum improvement blueprint.

For evidence of this he cites research carried out at Redhill in an area which had high salt and boron levels, a range of pH levels and a history of poor durum crops.

“Sodium concentration in Krichauff and Worrokatta plants sampled in 2003 was about one-third of that expected with the subsoil salinity level observed, so salinity is unlikely to be the dominant factor at Redhill,” Mr Cooper said.

He said where the soil pH was measured at 8.9, the average yield of Tamaroi durum in 2003 was 3.5 t/ha but dropped to 2.4 t/ha where the pH increased to 9.4.

Summarising the research Mr Cooper said it appeared likely that high pH in the subsoil was the dominant cause of yield suppression at Redhill stopping root growth in intolerant varieties and consequently stopping the uptake of salt and boron from the subsoil.

“Supporting evidence for this comes from data showing that the most reliable and profitable crops on these paddocks have been Krichauff wheat and lentils,” Mr Cooper said.

“Krichauff has tolerance to boron, salt and high pH while the lentil is a small plant that probably manages to extract enough water from the top 30 cm to produce commercially viable yields.”

Mr Cooper said bread wheats developed locally had tolerance to salt, boron and high pH resulting from 100 years of breeding and selection from areas with these problems.

For the relative newcomer, durum, progress was being made with salt and boron tolerance but it seemed high pH tolerance also needed attention if the full benefit of these advances was to be realised – especially given that these three subsoil toxicities tended to occur on the same soil types.

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