

Abstract

Measurements of leaf-level stomatal conductance (g_{sto}) are central to the ozone (O_3) risk assessment and the calculation of *Triticum aestivum* yield loss based on the absorbed O_3 phytotoxic dose (POD).

In this study we present measurements and a comparative analysis of g_{sto} field

measurements from four *triticum aestivum* cultivars grown as irrigated winter wheat in the

state of Punjab, in the NW-IGP during winter 2016-17 and 2017-18. The cultivars

RAJ3765, GW322, C306 and DBW88 were directly obtained from breeders, while local

farmers cultivars obtained from a seed shop were grown for comparison.

The g_{sto} measurements in combination with phenology observations on the plants are used

to derive environmental response functions for the parameters light, temperature, soil

moisture, water vapour pressure deficit, plant phenology and time of the day for all nine

triticum aestivum cultivars.

The response functions thus obtained can be used for two purposes.

Firstly, we use them

for revising the g_{sto} model parameterization of the DO3SE model in order to precisely

model the ozone related crop yield losses using the POD 6 exposure-response functions for

each of the cultivars for both growing seasons. Secondly, the same environmental response

functions have also more immediate uses in identifying a given cultivars potential to cope

well with certain climate change or air pollution related stressors, such as heat waves and

droughts or its potential to fare well in years affected by prolonged wintertime fog in the

NW-IGP.