

# UNDERSTANDING AND EXPLOITING WHEAT NITROGEN RESPONSIVENESS

Improvement in wheat grain yield and quality have been driven by the selection of new varieties, application of nitrogen fertiliser and associated agronomic practises. Nitrogen application leads to increased yield generally up to a plateau where further application is costly to the farmers and to the environment.

Nitrogen responsiveness is defined as the capacity of plants to increased yield under greater nitrogen availability (Figure 1). This capacity to benefit from additional nitrogen is dampened when plants are grown under higher nitrogen conditions.

NIAB aims to gain a better understanding of the regulation of nitrogen responsiveness and how it is dampened under increasing nitrogen availability.

This includes translating fundamental work in other plant species relating to the sensing of the plant nitrogen status that can regulate and dampen nitrogen responsiveness.

NIAB is also assessing varieties under different nitrogen level – running field trials to assess N responsiveness in a few varieties to develop protocols useful to assess more varieties in the future to link our pot-based experiments to field level response.

The dampening of N responsiveness is relevant to achieving high grain protein content. Post-anthesis N uptake, which correlates to high grain protein content, is dampened under high N conditions. Measuring post-anthesis N uptake using stable N isotope shows that the majority of the N applied is found in the grain a few days after application (Figure 2).

Figure 1. Wheat yield response to nitrogen application

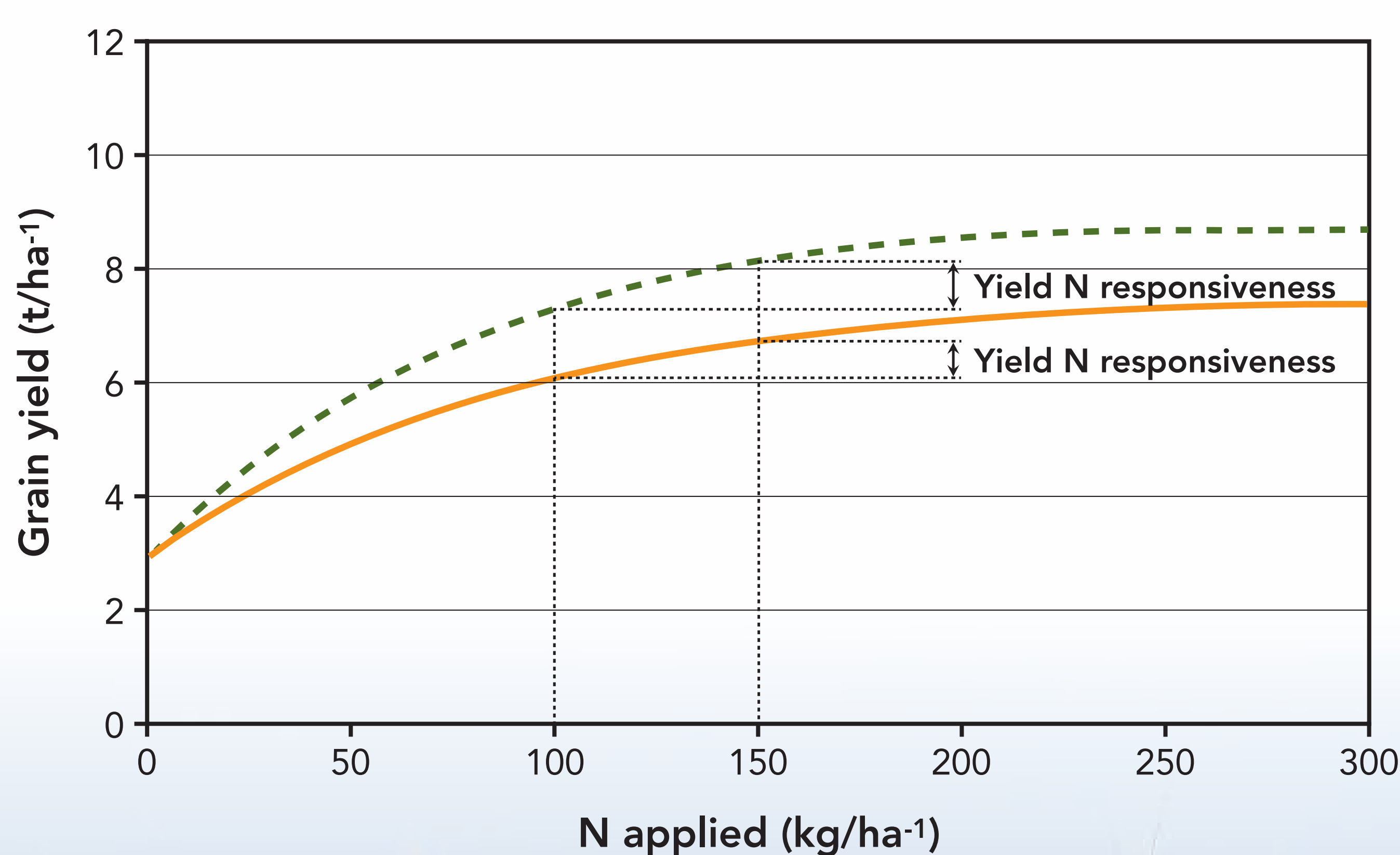


Figure 2. Measurements of post-anthesis N uptake

