A review of optical methods for assessing nitrogen contents during rice growth

Abstract

Concerns over the use of nitrogen have been increasing due to the high cost of fertilizers and environmental pollution caused by excess nitrogen applications in paddy fields. Several methods are available to assess the amount of nitrogen in crops. However, they are either expensive, time consuming, inaccurate, and/or require specialists to operate the tools. Researchers have recently suggested remote sensing of chlorophyll content in crop canopies as a low-cost alternative to determine plant nitrogen status. This article describes the most recent technologies and the suitability of different remote sensing platforms for determining the status of chlorophyll content and nitrogen in crops. Finally, the role of vegetation indices in nutrient assessment is explained. Among different remote sensing platforms, a low altitude remote sensing system using digital cameras, which record data in visible bands can be used to determine the status of nitrogen and chlorophyll content. However, the vegetation indices need to be correctly chosen for best results.

Keyword: Nitrogen; Chlorophyll content; Remote sensing; Low altitude remote sensing system; Digital camera