

The use of crop monitoring for problem analysis and decision making in wheat crops

J.D. Hughes¹, and P.D. Cregan²

¹ NSW Agriculture, PO Box 736, Deniliquin, NSW 2710

² Charles Sturt University, School of Agriculture, PO Box 588, Wagga Wagga, NSW 2678

Summary. A crop monitoring project was conducted in 1994 in the Harden-Murrumburrah district by the Harden-Murrumburrah Landcare Group. Wheat crops were monitored by district growers to improve understanding of wheat growth and yield. All information gathered was recorded on a data base for analysis of results. Additionally, 13 paddocks were intensively monitored to assist in interpretation of data base information. Yield was found to be highly correlated to water use, due to the below average rainfall for the year. For this reason stored moisture at sowing, soil type, and sowing date all had significant effects on yield.

INTRODUCTION

Crop monitoring can have multiple benefits. Encouraging wheat growers to monitor the parameters affecting the growth and yield of crops is likely to benefit the processes of extension. This type of activity is a form of experiential learning, a process that is likely to result in improved uptake/internalisation of knowledge (1, 2). The success of extension programs with a high community and/or end user input is evident, in projects such as Landcare, MEYcheck, and Topcrop. In the HardenMurrumburrah district a wheat monitoring project was initiated as an extension exercise, while concurrently identifying management practices likely to maintain or improve crop yields in a sustainable manner.

Information gathered in the crop monitoring process has identified areas requiring further investigation, while verifying the existing research and extension information.

METHODS

The Harden-Murrumburrah district is located in the South-west slopes of NSW. Average annual rainfall in the district ranges from approximately 600 to 700 mm. Soils in the district are predominantly granite based, with red and yellow podzolic soils being most common. In the South-west of the district basalt soils such as the euchrozem are common (3).

Crop monitoring was conducted on two levels. First level monitoring was conducted on 65 wheat paddocks in the Harden-Murrumburrah district. All monitoring was conducted by landholders and was based upon five crop/paddock inspections at strategic times in the plant growth cycle. This information, along with cultural history and management practices were recorded on a survey form issued by the Harden-Murrumburrah Landcare Group.

The second level of monitoring involved more detailed observations of soil and plant data. Intensive monitoring of this manner was carried out at 13 sites. Soil moisture readings were taken at sowing and harvest by gravimetric sampling at 9 sites, while neutron probes were installed at 4 sites, allowing detailed study of water use. Soil moisture measurements allowed an accurate assessment of water use according to equation 1.

$$WU = a + (s_{mi} - s_{mf}) * (i)$$

where; WU = water use (mm)