SECTION 3 - LAND USE AND MANAGEMENT

3.1 Soil Fertility and Crop Rotation

The area surveyed is representative of the Kalkee Plains north of Horsham. These plains are intensively cropped, largely to dryland wheat, and are noted for their relatively uniform and highly productive friable clay soils. Originally, a two-course rotation, fallow-wheat (sometimes 9including barley and oats), was common farming practice.

Over a period of about 50 years this system led to a decline in yields due to both reduced levels of soil nitrogen and an increase in the population of the cereal cyst nematode (*Heterodera avenae*). During the mid-1940s barrel medic (*Medicago truncatula*) was introduced as a pasture (ley) phase in the rotation. This practice increased soil nitrogen and crop yields.

3.2 Effect of Soil Properties on Land Use

The soils in this area occur mainly as a mosaic of what are known locally as *black soils* and *red soils*. The *black soils* are considered to be well structured, easily worked and to have a good moisture infiltration and storage characteristics. The *red soils* are regarded as poorly structured, especially with regard to their immediate subsoils. A feature which makes cultivation under wet conditions particularly difficult and which may reduce crop yields. A detailed description of these soils is given in Section 5.
During the last 50 years, experiments conducted by the Victorian Department of Agriculture, mainly on the red soils in different parts of the Wimmera, showed that by adding gypsum the soils became more workable and fertile (Sims and Rooney, 1965).

The current practice in areas where both soils occur (mosaics) is to apply gypsum to the red soils so that the area may be more easily managed as a single unit.