Soil fertility refers to the ability of a soil to sustain agricultural plant growth, i.e. to provide plant habitat and result in sustained and consistent yields of high quality. A fertile soil has the following properties: The ability to supply essential plant nutrients and water in adequate amounts and proportions for plant growth and reproduction; and the absence of toxic substances which may inhibit plant growth. The following properties contribute to soil fertility in most situations: Soil organic carbon (SOC) is an essential component of soil fertility, but to maintain SOC levels, the soil depends on crop residue input. On the other hand, biofuel production, e.g. CH4 from maize, depends on harvesting basically the same carbon from the field and feeding it to an anaerobic digester. How can these two demands be reconciled in view of long-term maintenance of soil fertility? ... Read more. Denis J Murphy. Soil fertility and soil productivity appear to be synonymous but in soil science these two terms bear different meanings. Soil fertility may be defined as the ability of soil to provide all essential plant nutrients in available forms and in a suitable balance whereas soil productivity is the resultant of several factors such as soil fertility, good soil management practices availability of water supply and suitable climate. ADVERTISEMENTS Water-logged soils may be highly fertile but may not produce good crop because of the unfavourable physical conditions. A fertile soil may be highly saline or alkaline which may not be good for agriculture Sandy soil may be poor in fertility but with the use of fertilizers and water it may be made productive.