Editorial

BIOMEDICAL Journal of Scientific & Technical Research

ISSN: 2574 -1241

DOI: 10.26717/BJSTR.2020.31.005047

The Significance of Biologically Formed Soil Pores in Agriculture

John Darbyshire*

Dip.Agric.Sci.{Cantab}, Now retired, London

***Corresponding author:** John Darbyshire, Dip.Agric.Sci.{Cantab}, Now retired, London

ARTICLE INFO

Received: October 01, 2020

Published: October 12, 2020

ABSTRACT

Citation: John Darbyshire. The Significance of Biologically Formed Soil Pores in Agriculture. Biomed J Sci & Tech Res 31(1)-2020. BJSTR. MS.ID.005047.

Editorial

Soil biopores can originate from plants and animals. Plant biopores develop during the natural decay of old plant roots. Studies with soil thin sections suggest that the first part of the decay occurs in the thin walled parenchymatous root cortex. Later, the areas of local tissue disorganisation merge, conducting tissue gets pushed aside and well-developed central pores develop. The burrowing activites of soil animals produce numerous types of biopores, but only earthworms have been investigated in detail. Earthworms frequently move up and down their burrows and secrete mucilage that results in well-compacted walls. How long plant and animalbiopores survive in the soil is uncertain especially under conditions of minimum cultivation. Do the majority of soil microbes reside in biopores? Soil biopres aid the movement of water and nutrients through the soil These pores are particularly important in soils with clay pans and impeded drainage. The branching network of plant roots when they are transformed into biopores is a natural network connecting different layers of soil for water, nutrients and microorganisms to move more freely .Minimum cultivation would result in less destruction of the natural network of biopres than conventional ploughing and elaborate seedbed culivations.

Can one use deep-rooted plants like lucerne as an intercrop after autumnal harvest of cereals to boost the numbers of biopores and saprophytic microbial antagonists to root pathogens with minimum cultivation? If global warming results in warmer winters in north temperate areas, then the fallow period between autumn and spring may become more important. This Lucerne ley crop could be extended for some 3 to 5 years to establish a good sward. The next successive cereal crops could be introduced on top of the Lucerne sward when required by minimum cultivation. This would give farmers more flexibility in their rotations and better able to adjust to market conditions. The minimum cultivations would require less time and fuel. The resultant straw from these cereal crops would contain some Lucerne plant material and improve its feed quality for animals. How long the Lucerne sward will be productive is uncertain and will determine when more Lucerne is sown by minimum cultivation. The nitrogen-fixing bacteria associated with Lucerne would improve the nitrogen content of the soil. Weeds and soil erosion may be reduced as the period of bare soil would be kept to a minimum. Perhaps cereal root diseases would also be reduced.

Cereal crops {wheat, barley} planted after oil-seed rape in north-east Scotland soils with impeded drainage have been reported by farmers to produce increased yields of grain. They have suggested that the roots of rape grow through the impeded iron/clay pans and that the succeeding cereal roots follow the old root channels of rape to derive extra water or nutrients from the deeper zones of the soil. This suggestion needs to be confirmed or corrected by detailed observations. Gregory {personal communication} also found in Australia that wheat roots can follow old Lucerne biopores under minimum cultivation. If the biopores survive for years, then the improvement in drainage in impeded soils should increase with time under minimum cultivation with Lucerne leys. What evidence exists for this supposition ? The life spans of soil biopores need to be determined in different soils and conditions. Plants labelled with isotopes and soil thin sections could be used to identify the plant remnants in the biopores. The nature of animal biopores could be studied also with soil thin sections.

ISSN: 2574-1241

DOI: 10.26717/BJSTR.2020.31.005047

John Darbyshire. Biomed J Sci & Tech Res