Paragraph 1 – Plant strategies and roots

* How plant strategies change along environmental and disturbance gradients has been extensively studied in aboveground functional traits, but belowground functional traits have historically received less attention.
* Functional traits are defined as the physiological properties of a plant that influences the species’ growth, survival and reproduction.
* Combinations of these functional traits are referred to as trait economic spectrums.
* Plant economic spectrums are made up of root and leaf economic spectrums, which show a gradient of conservative to acquisitive strategies (Tilman)
* Historically, root economic spectrums were thought to be concurrent with the better studied leaf economic, but we now know this not to be the case

Paragraph 2 – Mycorrhizal symbiosis and fire

* A large reason for this is the presence of a second economic gradient in root systems involving collaboration with mutualistic microbial symbionts
* Arbuscular mycorrhizal fungi are an ancient nutrient symbiosis between most land plants and a monophyletic fungal clade called the Glomeromycota.
* This symbiotic relationship can act as a limiting factor in plant growth when light intensity is high (Tilman)
* Climate change is predicted to result in increasing frequency and severity of extreme events, including fire.
* Fire is an ecologically important disturbance and contributes to the maintenance of healthy ecosystems.
* Some studies have suggested that fire reduces mycorrhizal colonisation and soil fungal diversity, though others have shown no effect

Paragraph 3 - Introduction to study

* In this study, the mechanisms by which fire frequency may affect mycorrhizal colonisation are investigated using data obtained from Cedar Creek Ecosystem Reserve.
* The interplay between fire, soil nitrogen and phosphorous, root system architecture and arbuscular mycorrhizal colonisation will be investigated.
* To quantify mycorrhizal colonisation, a modified clearing and staining method was used, with a modified light microscopy being performed intersection method was used.
* Due to mycorrhizal staining being relatively uncommon in ecological studies (in favor of RNA-seq using 18S rRNA), considerable troubleshooting was required for consistent successful measurements of mycorrhizal colonisation in root samples of different species.