Mycorrhizal symbiosis is one of the most important relationships between microbiota and plants to sustain plant nutrition in relatively unfavourable conditions. Somehow this relation is threatened by time, therefore, definition of the factors affecting mycorrhizal symbiosis has become essential. The aim of this study was to determine the differences in specific mycorrhizal parameters such as sporulation and soil–plant environment conditions in three different regions of Turkey. During 1996-2002, 53 soil series were selected from natural and agricultural plant communities in three different agro-ecological zones of Turkey: Central Anatolia (CA), the Southeastern Anatolian (SA) project area and the Coast of Mediterranean (CM). The arbuscular mycorrhizal fungus (AMF), spore numbers and mycorrhizal root colonization were related to the annual average precipitation, soil characteristics and host plant identity. In the CM zone (average annual precipitation of 650 mm), soils found under natural vegetation contained a maximum value of 108 spores g⁻¹, with bare soils containing a minimum number of 0.1 spores g⁻¹. In the CA zone (330 mm annual average precipitation), the maximum number of spores in the soil samples was 46.5 spores g⁻¹ with a minimum of 6.8 spores g⁻¹ and in the SA soil samples (380 mm annual average precipitation), a maximum of 48.4 spores g⁻¹ and a minimum of 14.2 spores g⁻¹ were recorded. The overall mean number of mycorrhizal spores g⁻¹ soil was 15.5 ± 14.4, 22.2 ± 8.6 and 27.9 ± 25.4 for the CA, SA and CM zones, respectively. Mean spore numbers differed in only two of the three zones, with the third zone being intermediate. Precipitation was the most affecting factor on the sporulation of AMF. Also host plant species and certain soil parameters, such as positive correlations with CaCO3 and N-min and a negative correlation with organic matter, have an influence on sporulation. The key finding is that the cropping system has a large impact on spore numbers/abundance. Seventeen standing crops as well as bare soil, fallow and natural areas were compared. There are a large number of factors which can affect mycorrhizal development; in the present work, it seems that soil and crop management, and environmental factors (such as precipitation) affect sporulation and root colonization. Covering land surface with mycorrhiza-dependent cover crop, irrigation and less soil till may increase indigenous mycorrhizal spores.