

title	Soil and Fungal Relationships of Perennial Veldt Grass ( <i>Ehrharta calycina</i> )
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proj_desc	<p>Perennial veldt grass (<i>Ehrharta calycina</i> Smith) is a common, invasive, perennial grass in California and Texas. It is native to southern Africa, and was imported to the United States by the University of California Cooperative Extension in the 1940's for rangeland forage improvement. Its use was encouraged by the Soil Conservation Service for erosion control. It favors sandy soils and generally is found in coastal areas on ancient sand dunes, where it begins colonization in disturbed areas, and quickly spreads through prolific seed production and from bulblets formed at the crown. It is capable of invading undisturbed herbaceous plant communities and suppresses native plant germination in California. Veldt grass is regarded as a serious weed in California by local, state, and federal agencies and organizations (for example, The Land Conservancy, CALEPPC, and the U.S. Department of Agriculture). Veldt grass is a densely tufted perennial, 30 to 60 cm (1 to 2 feet) tall. It is a prolific self-seeder; seeds are light and may be spread by wind and browsing animals.</p> <p>Most studies of veldt grass have been aimed at its suppression. Efforts at suppression of veldtgrass have included intensive grazing, herbicides, and fire, with mixed results. Other than studies concerning eradication of veldt grass, little of its ecology in coastal California appears to have been studied, particularly regarding soil-plant relations. A study conducted by this author and an off-campus collaborator in 2001-2003 found perennial veldt grass to be present from Bodega Bay to San Diego, and especially abundant in San Luis Obispo and Santa Barbara Counties. We established that in geographical areas where rainfall is limited, veldt grass is more efficient than native shrubs at taking up water from shallow sandy soils. But, nothing apparently is known of its nutritional requirements. It is obviously adapted to sandy soils, which have little nutrient or water holding ability. Mr. Vince Cicero, Resource Ecologist for the California State Parks and Recreation Department, has also indicated that little is known of the requirements of veldt grass, and he wondered whether veldt grass is mycorrhizal (personal communication, 1999). Examination by stereo microscopy suggests that veldt grass either is mycorrhizal with mycelia that cling to sand grains, or has very fine root hairs that cling to sand grains.</p> <p>This study proposes to determine (1) if veldt grass is mycorrhizal, and, if it is, (2a) what is the relationship of mycorrhizal mycelia and sand grains (for example, Do mycelia penetrate sand grains to obtain nutrients? Do mycelia or root hairs accelerate sand grain weathering by etching surfaces?); if veldt grass is not mycorrhizal, (2b) what is the relationship between root hairs and sand grains. Veldt grass will be sampled from Los Osos, California.</p> <p>Veldt grass, with roots and soil attached, will be collected from the field in random sampling. Mycorrhizae will be identified by staining technique in the laboratory, and stained samples will be examined by optical microscopy. Additional samples will be examined by Scanning Electron Microscopy (SEM) to examine sand grain morphology with the mycorrhizae or root hairs attached.</p>
inter_desc	This project integrates weed science, microbial ecology, soil science, and mineralogy, applying these disciplines to an important ecological concern, invasive species. Thus, an Earth Sciences or Soil Science major is sought. In addition, this project proposes to use SEM in a rather unique application, giving a new scope of experience to a Materials Engineering student.
links	none at this time
students	2
majors	ERSC, SS, MATE
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