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Soil Stabilizing Characteristics of Rangelands Vegetation in Northwest Iran (misho Rangelands Protected Location of Shabestar)

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Abstract

The composition of rangelands vegetation influences how well a rangelands area functions and hence has an important effect on the state of a slope. In northwest Iran, much rangelands vegetation was cleared for agricultural land use consequently ecosystem services provided by rangelands vegetation have been lost or seriously changed. The ecosystem services provided by rangelands vegetation are vital, and vary from stabilising slopes and filtering runoff, through shading and protection of animal habitats, to enhancing aesthetics and controlling downstream flooding. Of these, slope stabilisation is often regarded as being of high importance because, without it, many of the other functions may be limited by erosion and its consequences, e.g., undesirable changes in rangelands slope morphology, and excessive in stream sedimentation. The stabilising role of rangeland vegetationsdepends on increase the shear strength of slopes soils, protect surface soil, take water from the soil (via transpiration and evaporation), increase filtration of soil, support the toe of slope (buttressing), protecting it from shear failure. These functions can be affected by the rangelands slope scale and slope steepness. Eight plants of each species were measured for height, canopy spread, root collar diameter and maximum root depth, and lateral root spread. To obtain canopy spread the maximum diameter of the foliage was measured in both an E—W and N—S direction and averaged. Roots of plants stable soils on slope and provide resistance against the forces that improve slope instability. In the northwest of Iran (East Azarbayjan state), rangelands were changed to agricultural land use; this vegetation is unsuitable vegetation on a slope to stable them. Restoration of rangelands vegetation effects, largely to improve slope health, is focussed on replacing agricultural plants with rangelands species, but little is known about their slope stabilising characteristics. We studied 4 rangelands plant species to determine these characteristics. Data available for 2 and 3 year old shrub plants indicate that Gavan (*Astragalus raddei*) has high root spread and rooting depth. Data for older plants of this species will be used to improve landslide threshold models for vegetated slopes.

Keywords: *Astragalus*, Iran, landslide, rangelands

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