sites (P=0.001). On continuously grazed sites, approximately 90% of the phytomass was harmal peganum (Peganum harmala L.), a non-palatable, toxic perennial plant. The Shannon/Wiener diversity index was 0.2-0.3 for the grazed areas, compared to 2.0-2.5 for the protected depressions. Thus, it is possible to increase the productivity and diversity of degraded landscape depressions in arid rangeland ecosystems. We suggest that rational, scientifically-based grazing systems, that balance seasonal animal consumption with plant growth, can maintain ecosystem services while providing forage for livestock.

Keywords: arid ecosystems, rangelands, grazing species diversity, landscape depressions, Syrian badia

2.4.13. Potential of triticale to mitigate impact of climate change on food security in crop- livestock systems in non-tropical dry areas

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Feed deficits, partly due to low and erratic mean total rainfall, are widespread in countries in the non-tropical dry areas of Central and West Asia and North Africa. There is need to identify accessions of food/feed crops that have high water productivity and are adapted to saline conditions. A 2-year trial compared 39 triticale accessions for forage and grain production, and forage quality at two dryland sites with varying average total annual rainfall in Tel-Hadya and Breda, northwest Syria. Significant (P<0.05) site x accession interaction was recorded for phonological and morphological traits; yield and yield components, and concentrations of hay and straw crude protein, acid detergent fiber, neutral detergent fiber, and in vitro organic matter digestibility. Promising accessions were identified, based on grain, hay and straw yield, and hay and straw quality as selection criteria. These accessions could be integrated into small-scale crop-livestock systems to mitigate the effects of climate change on food and feed insecurity on resource poor crop-livestock farmers in the non-tropical dry areas.

Keywords: climate change, crop-livestock system, feed deficit, triticale accessions.

2.4.14. Role of soil organic matter and balanced fertilization in combating land degradation and sustaining crop productivity

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Land degradation is a widespread problem throughout the tropics and subtropics. The extent of degraded lands in India is estimated to be around 158 million hectares. Restoration of these lands is of prime importance for economic and ecological reasons in both irrigated and rainfed ecosystems. The economic rationale for restoration of degraded soils is related to productivity and income. Important among ecological reasons are carbon sequestration in soil to mitigate the greenhouse effect, and minimizing risks of pollution, contamination and eutrophication of natural water. There is tremendous potential to sequester carbon through restoration of degraded ecosystems, and more so through reclamation of salt affected lands. The soil organic carbon (SOC) pool constitutes one of the five principal global carbon pools, the others being oceanic, geologic, atmospheric and biotic. The rate of depletion of SOC in tropical soils is exacerbated by the onset of soil degradation processes, including the decline in soil structure leading to crusting/compaction and accelerated runoff and erosion, reduction in soil biotic activity, leaching of bases, and depletion of soil fertility. Although the amount of SOC in