

Abstract

Sustainable agriculture is based on the efficient management of the elements of production in agricultural lands by return of crop residual for increase organic matter in order to improve the quality of soil. In order to evaluate integrated fertility management and harvest time on the quality and quantity of corn forage, an experiment was conducted as split plot based on a randomized complete block design with three replications in the research farm of Zabol University during 2016-17 crop year. The main factor included various levels of fertilization in 10 levels: (no fertilization, 30% wheat residue, 60% wheat residues, 90% wheat residues, 30% vermicompost, 60% vermicompost, 100% vermicompost, 10% vermicompost + 90% wheat residues, 40% of vermicompost + 60% of wheat residues and 70% vermicompost + 30% of wheat residues) and the sub-factor was harvesting time in two levels: (milky and dough stages). The amount of vermicompost and wheat residues was estimated at 10 and 5 tons per hectare, respectively. The results showed that in the seed milky stages, the highest dry matter digestibility of leaf was obtained for 60% of wheat residual and in stem in terms of the 10% vermicompost plus 90% of wheat residual. Also, the highest percentage of crude protein in leaf was obtained for 60% vermicompost and in stem in terms of the 70% vermicompost and 30% of wheat residual, which was advantages 9.47% in leaf and 111.11% in stem compared to control treatment, respectively. Similarly, the highest percentage of leaf and stem ash was obtained for 70% vermicompost and 30% of wheat residual. The highest non-soluble fiber in acid detergent and neutral detergent in leaf and stem was obtained under the non-fertilized conditions (control). In addition, at the seed doughy stages, the highest percentages of water-soluble carbohydrates in leaf and stem were obtained for 10% vermicompost plus 90% of wheat residual. The highest percentage of crude fiber in leaf was obtained for 10% vermicompost plus 90% of wheat residual and in stem in terms of the 70% vermicompost and 30% of wheat residual. Most of the treatments were applied with the application of 70% vermicompost and 30% of wheat residual in leaf and stem in a statistical group. Finally, the highest volumetric moisture content in the milky stage and for 60% of wheat residual; the highest soil temperature in the seed doughy stage and for 40% vermicompost + 60% wheat residual; and the highest light absorption was observed in the seed doughy stage and for 30% of wheat residual, which was advantages 16.17% compared to control treatment, respectively. The optimal quality is obtained when the plant has dry digestibility, crude protein, water-soluble carbonate hydrates and more ash content. In general, using a ratio of 70% vermicompost + 30% of wheat residues to control treatment improved the quality of forage during the milky stage.

Key Words: Plant residue, Crude protein, Harvesting time, Vermicompost



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