Effect of intercropping patterns on yield and its components of barley, lupin or chickpea grown in newly reclaimed soil.

Abstract

During the two successive seasons of 2008/09 and 2009/10,at the experimental Farm, Faculty of Agriculture. Fayoum University, the present work was executed in sand loamy poor fertile soil .The work aim was to answer the question what the extent to which the productivity of barley, lupin and chickpea influenced by their intercropping, with the hope of raising the development of such soil. The experiment was designed through split plot arrangement in a randomized complete block with three replications. The main plots were assigned for three crops and sub plot were devoted for cropping systems, i.e., sole crop, barley/chickpea or lupin in 1:1, 2:1 and 2:2 intercropping. The obtained results showed that all barley, lupin and chickpea traits were significantly affected by intercropping patterns. Barley spikes/m2 as well as spike grains number and weight were affected by legumes species. Solid planting of each crop surpassed all intercropping patterns for almost all studied traits. The tallest lupin plant with the highest position of the first branch were obtained from 1:1 intercrop patterns, due to interspecific competition on light. All intercropping patterns resulted in harvest indices surpassed that of sole lupin planting. However, solid lupin was superior to intercrop patterns for numbers of branches and pods in addition to seed weight/plant and seed yield/feddan. But, barley /lupin of 2:2 was the best among all intercropping patterns, where it produced 93 and 60% of solid lupin seed weight/plant and

yield/fed., respectively. Superiority of solid chickpea traits reflected it's more influencing by intercropping than lupin, due to greater competition of barley. Likewise lupin, the 2:2 pattern was the best combination, where it produced 95 and 50% of soled chickpea seed weight/plant and yield/fed., respectively. The greatest and heaviest barley grains/spike were obtained from barley/chickpea, while the greatest number of spikes/m2 were produced by barley/lupin, due to different legumes growth habit. Heaviest seed and harvest indices were given by 2:2 patterns. All intercropping patterns showed similar barley harvest indices surpassing that of solid planting. The combination 2:1 barley/chickpea or lupin had heaviest weight of grains/spike (103% of sole) and acceptable yield/fed (83% of solid barley). Under this combination (2:1) barley yield/fed. produced by barley/lupin followed by barley/chickpea were presented by 84 and 75%, respectively, of solid barley yield. Also under this combination pattern, the lupin and chickpea yields reached 40 and 29%, respectively, of their solid cropping. Land equivalent ratio, competitive ratio, relative crowding coefficient and aggressively results revealed that barley was stronger competitive than legumes, lupin was more competitive than chickpea,and barley was dominant and each legume crop was dominated.