

## Abstract

In order to study effect of multiple weed species competition and soybean on, dynamic of weed and determine the optimum sowing date and soybean crop density a, field experiment was conducted in 2013, at Agricultural Research Station, Ferdowsi University of Mashhad, as split-split based on a randomized complete block design with three replications. Main plot included three sowing dates levels ( 17 April, 12 May, 6 June ) and sub - plots included four crop density ( 30, 40, 50 and 60 plant . m<sup>-2</sup> ) and sub - sub plots included weed management of two level ( weed infested and weedy control ). Destructive Sample and non- destructive operations either 35 days after planting is done every two weeks according to the density and size Quadrat variable crop soybean plants were harvested at each sampling 4 plants. After sampling each weed species to counted and leaf area index and dry weight was measured each separate species. To evaluate the competition and intra – and inter specific competition coefficients of the dry weight, relative leaf area per plant and weight as independent variables and the natural logarithm of the weight of each weed plant or soybean as the dependent variable multiple linear regression functions were fitted. it was found that the logarithm of the weight of the plant (as the dependent variable) and dry weight (as the independent variable) have the highest correlation ( $r^2=96$ ) for estimate yield losses and competitive factor. Interference of Weeds with soybean base on equation coefficients were classified into two groups, the lowering (negative coefficients) and facilitator (positive coefficients). Logarithm regression functions weight per plant showed the highest inhibitory effect on the first sowing date of Common purslane that facilitators effect on Pigweed impact in the soybean. The second sowing date Lambsquarters with a positive effect on Barnyardgrass, Black night shade Bindweed, Common purslane, Crab grass and crab grass positive effect on the weight of the soybean plant. In the third sowing date Black night shade greatest deterrent effect on weight applied. The highest rate of competition within the species of Common purslane in the third sowing date. the different between the maximum significantly relative growth rate, crop growth rate, leaf area meter, total dry matter weed interference treatments (all season) with weed control there had .highest yield in the second sowing date (optimum density) and 40 plant per square meter (high density ) in the mashhad weather condition, respectively.

**Key words:** Dynamic, Facilitators, Regression, Logarithm of the weight of the plant