## Studies on bio-efficacy and phyto-toxicity of pendimethalin 38.7 % CS against weeds in groundnut (Spanish bunch) and its residual effects on succeeding wheat and sorghum crops in groundnut-sorghum/wheat sequence cropping system (94)

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Groundnut is an important oilseed crop of India. Weeds pose a serious problem and weeds alone account for one-third of the total losses due to pests. Pre-emergence herbicides such as Alachlor 50 % EC, Pendimethalin (30 % EC and 38.5 % CS) and Oxyfluorfen (23.5 % EC) are being used for control of weeds in groundnut. Pendimethalin is available in emulsifiable (EC) and capsulated suspension (CS) formulations. It is reported that pre-emergence application of Pendimethalin 38.7 % CS is more effective than Pendimethalin 30 % EC in control of weeds. Therefore, a field trial was carried out during two consecutive years (2012-13 and 2013-14) at MARS, UAS, Dharwad on medium Vertisol to determine the efficacy of CS formulation of Pendimethalin @ 483.75 g, 580.50 g, 677.25 g, 750.00 g and 1354.50 g/ha over EC formulation of Pendimethalin @ 1000 g/ha in controlling weeds in groundnut during kharif and its residual effects on succeeding sorghum and wheat during rabi. Results indicated that pre-emergence application of both formulations of Pendimethalin, in general, were more effective in controlling annual grassy and annual broad leaved weeds. However, pre-emergence application of Pendimethalin 38.7 % CS @ 483.75 g to 1354.50 g/ha was ineffective against congress weed (*Parthenium hysterophorus* L.). Pre-emergence application of Pendimethalin 30 % EC @ 1000 g/ha was very effective against congress weed. Pre-emergence application of Pendimethalin 38.7 % CS resulted in relatively higher weed biomass and lower weed control efficiency than pre-emergence application of Pendimethalin 30 % EC. Both the formulations of Pendimethalin did not cause toxicity on groundnut or succeeding sorghum and wheat. Pre-emergence application of either Oxyfluorfen 23.5 % EC @ 100 g/ha or Alachlor 50 % EC @ 2500 g/ha were effective against congress weed and did not cause any ill effects on succeeding sorghum and wheat.

**Keywords:** Pendimethalin 38.7 % CS, Pendimethalin 30 % EC, Phyto-toxicity, Broad leaved (Dicot) weeds, Annual grassy (Monocot) weeds

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## Chemical control of the invasive weeds *Ambrosia artemisiifolia* and *Acalypha virginica* in maize fields (627)

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*Ambrosia artemisiifolia* and *Acalypha virginica* are exotic weeds in Europe that are becoming key weeds in summer annual crops. In this study, different chemical weed control strategies were compared in maize: pre-emergence, pre+post emergence, post-emergence, untreated check. The study was carried out in northern Italy during 2015 at two different sites, Grugliasco and Mesero. *A. virginica* was present only at the Mesero site. A RCBD with 21 $m^2$ and 25 $m^2$ plots, and with four and three replicates was used in Grugliasco and Mesero, respectively. The efficacy of each weed control strategy was assessed by measuring plant density (plants/$m^2$) and ground cover (%). Weed assessments were carried out about one week after the treatment application. At the first assessment, in Mesero the infestations of *A. virginica* and *A. artemisiifolia* in untreated plots were 560 plant/$m^2$ and 70 plant/$m^2$, respectively. At the same assessment, at Grugliasco, more than 47 plants of *A. artemisiifolia* were recorded. At both sites, all the compared weed control strategies completely controlled *A. artemisiifolia* infestations. In Mesero site, *A. virginica* infestation was completely controlled by pre and pre+post emergence treatments. At the assessment carried out after the post-emergence application the average plant density of *A. virginica* was 73 plant/$m^2$ in treated plots, and 362 plants/$m^2$ in the untreated checks, with an average efficacy about 89%. The reduced efficacy of the post-emergence strategies is probably due to the advanced growing stage of *A.virginica* plants at the time of post-emergence application.

**Keywords:** Invasive species, *Ambrosia*, *Acalypha*, control strategies, chemical management

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