

Journal of Plant Development Sciences

(An International Monthly Peer Reviewed Journal)

Volume 16

Number 6

June 2024

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DISSIPATION BEHAVIOUR OF ETHALFLURALIN HERBICIDE IN SOIL

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Received-10.05.2024, Revised-05.06.2024, Accepted-21.06.2024

Abstract: A laboratory experiment was undertaken to investigate the persistence of ethalfluralin (35 EC) at recommended and double dose in Inceptisol soil. To carry out this study, surface soil samples (0-15 cm) were collected from experimental farm of Krishi Vigyan Kendra, Fatehabad (Haryana) in year 2021 and processed for initial soil physico-chemical properties analysis. Also separately, 2 kg of Inceptisol soil in pots along with a control in which no herbicide was added was taken for study. During experimental period pots were kept at room temperature of $25 \pm 2^\circ\text{C}$ and field capacity moisture level. 20 g of soil samples were drawn in triplicate and analyzed periodically after 0 (1 hr), 1, 3, 7, 10, 15, 30, 45, 60, 90 and 120 day after treatment (DAT). The soil samples were further processed and 20 g representative soil was taken as test sample and processed for residue analysis. For improved extraction and cleanup various techniques were optimized and maximum recovery of ethalfluralin was obtained in MSPD without florisil at three fortification levels. Residues of ethalfluralin reached below detectable limit after 90 and 120 DAT at recommended and double dose, respectively. Half-life of ethalfluralin ranged from 38-42.1 days. Slightly more persistence was observed at double dose as compared to recommended dose. Faster dissipation was observed upto 10 days and that might be due to microbial degradation.

Keywords: Inceptisol, Florisil, Herbicide, Dissipation, Soil

EFFECT OF SPACING REGIMES ON GROWTH AND YIELD OF *ENTEROLOBIUM CYCLOCARPUM*

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Received-27.05.2024, Revised-12.06.2024, Accepted-27.06.2024

Abstract: Studies were the effect of spacing regimes on growth and yield of *Enterolobium cyclocarpum* for its suitability in various fields of utility as a Multipurpose Tree Species adoptability in northern zone of Tamil Nadu. In evaluation of spatial trial plantation for its biometric measurements with four different spacing, the trees exhibited better increments of height and diameter over periodic measurements taken at a month interval. Hence, height and diameter could be considered as selection criteria in evaluating trees. The results are revealed that, the planted at 1.5 m x 1.5 m spacing exhibits maximum height growth (4.92 m) at 24 months after planting followed by the planted at 2 m x 2 m spacing (4.80m). The maximum diameter at breast height (DBH) was recorded for the planted at 1.5m x 1.5m spacing (0.098m) followed by 3m x 3m spacing (0.078m). In the spacing of 1.5 m x 1.5 m, spacing exhibits maximum height growth and volume. *Enterolobium cyclocarpum* is suitable for northern zone of Tamil Nadu. Hence, tree adopted in northern zone of Tamilnadu.

Keywords: *Enterolobium cyclocarpum*, Spacing, Multi-Utility, Growth, Yield, Wood

EFFECT OF PRE AND POST-EMERGENCE HERBICIDES ON *CYPERUS ROTUNDUS* INFESTATION IN GROUNDNUT (*ARACHIS HYPOGAEA* L.)

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Received-27.05.2024, Revised-13.06.2024, Accepted-29.06.2024

Abstract: Groundnut, also known as peanut, is a leguminous plant belonging to the Fabaceae family. It is widely cultivated for its edible seeds, which are commonly consumed as snacks or used in cooking and food preparation around the world. The *Cyperus rotundus*, commonly known as purple nut sedge, is a challenging weed in many crops, including groundnut (*Arachis hypogaea* L.). It can significantly reduce crop yields due to its aggressive growth and ability to compete for resources. The use of pre- and post-emergence herbicides is a common strategy to manage this weed. Here's an overview of how these herbicides affect *Cyperus rotundus* infestation in groundnut. The crop is highly susceptible to weed infestation because of its slow growth in the initial stages up to 45 DAS, short plant height, and underground pod-bearing habit. In contrast to other crops, weeds not only compete for vital resources during different stages of crop growth but also hinder pegging, pod development, and harvesting of groundnut. The present study entitled "Effect of pre and post-emergence herbicides on *Cyperus rotundus* infestation in groundnut (*Arachis hypogaea* L.)" was conducted at Agronomy Research Farm, CCS Harvana Agricultural University, Hisar during Kharif 2020. The experiment comprising sixteen treatments was laid out in randomized block design with three replications. Treatments consisted of weed management *viz.*, were imazethapyr + pendimethalin (RM) at 1000 g/ha, 1250 g/ha, 1500 g/ha and 1000 g/ha with one hoeing at 30 DAS, pendimethalin at 1000 g/ha and 1000 g/ha with one hoeing at 30 DAS, imazethapyr at 70g/ha and 70g/ha with one hoeing at 30 DAS, imazethapyr + imazamox (RM) at 70g/ha, imazethapyr + imazamox (RM) at 70g/ha pre-emergence with one hoeing at 30 DAS as pre-emergence application and imazethapyr + quizalofop 70+50 g/ha, imazethapyr + imazamox (RM) + quizalofop 70+50, Acifluorfen+clodinafop (RM) at 305g/ha as post-emergence and two hoeing compared with weed free and weedy checks. The results indicated that at 30 DAS, pre-emergence application of imazethapyr + imazamox @ 1000 g ha⁻¹fb one hoeing at 30 DAS (T₁₀) recorded significantly minimum density (1.33 m⁻²) of *Cyperus rotundus* as compared to other treatments and it was statistically at par with treatment T₄, with application of imazethapyr + pendimethalin (RM) @ 1000 g ha⁻¹fb one hoeing at 30 DAS (1.67 m⁻²). At 60 DAS lower density of *Cyperus rotundus* was found from treatment T₁₄ (two hoeing at 25 and 45 DAS) and it was statistically at par with pre-emergence application of imazethapyr + pendimethalin (RM) @ 1000 g ha⁻¹fb one hoeing (T₄). At 90 DAS, treatment T₄ in which imazethapyr + pendimethalin (RM) was applied as pre emergence @ 1000 g ha⁻¹fb one hoeing recorded significantly the minimum population of *Cyperus rotundus* in comparison to other treatments. In this way different treatment presented variable results in the experiment as discussed further.

Keywords: Groundnut, Herbicides, *Cyperus rotundus*, Pod yield

ASSESSING THE EFFECT OF GROWTH AND YIELD ATTRIBUTES OF SESAME AT RED LATERITIC ZONE OF WEST BENGAL

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Received-20.05.2024, Revised-13.06.2024, Accepted-28.06.2024

Abstract: A field experiment was conducted at Farmer's field located at Kaggari, Jhargram, West Bengal, India to study the effect of foliar nutrients on summer sesame (*sesamum indicum* L.) in alluvial soils of West Bengal in the year of 2021. The experiment comprised of 10 different foliar treatments viz. water spray, K₂SO₄ @ 0.75%, KCl @ 0.75%, NaCl @ 0.5%, NaCl @ 0.5%, N P K 19:19:19 @ 0.5%, N P K 19:19:19 @ 0.75%, N P K 10:26:26 @ 1.5%, D A P @ 1.5% at 50 % flowering and seed filling stage of sesame crop. The crop was sown on Jul 2021. A recommended dose of fertilizers was applied @ N₂: P₂O₅: K₂O -60:30:30 kg/ha in the form of N- P- K 10:26:26. Half nitrogen, full of phosphate and potassium as basal dose, remaining half of N was applied at 25 DAS. The variety of the sesame crop was Tillotoma (B-67). The experiment was conducted in randomized block design with three replications. Foliar nutrients were applied at flowering and seed filling stage of the crop with special reference to scanning their effect on growth and yield of the crop during summer season of 2021. The salient features of the findings were in general, application of spray salts at 50% flowering and seed filling stage recorded better growth and yield attributing characters. Among all the foliar nutrient treatments, significantly higher grain yield was obtained by N P K 19:19:19 @0.15% followed by N:P:K19:19:19 @0.5%. The lowest grain yield was obtained by spraying of water only. It is interesting to note that all the supplementary foliar nutrients enhanced seed yield of sesame significantly over control. Highest seed yield was recorded under the foliar feeding with N P K 19:19:19 (0.75%), and effective capsule per plant recorded by the application N P K (19:19:19)@0.75% followed by N P K (10:26:26) @1.5%. The seeds per capsule was improved by the foliar application N P K (19:19:19) @0.75%. The application of N P K 19:19:19 @ 0.75% was found to be most cost-effective foliar nutrient and D A P @1.5% was found to be second most cost-effective foliar nutrient.

Keywords: Crop, Field experiment, Foliar application, Sesame

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POTENTIALITY OF SOME PLANT EXTRACTS AS PRETREATMENT OF SEED PRIOR TO STORAGE IN REDUCING FUNGAL INFECTION

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Received-14.05.2024, Revised-08.06.2024, Accepted-24.06.2024

Abstract: Experiments were carried out to ascertain the potentiality of some plant extracts as pre-treatment of seeds in controlling fungal infection during storage. Based on the encouraging results of the in-vitro as well as pottrials conducted in author's laboratory, ethanolic leaf extracts of *Vitex negundo*, *Mimosa pudica*, *Piper beetle* and *Alamanda cathartica* were tested on mustard seeds prior to control. Seedling emergence (germination %) was studied after one month as well as one year of storage of treated seeds. Results indicated that the leaf extracts of *Piper beetle* and *Alamanda cathartica* were quite effective in controlling fungal infection as the germination percentage were higher than the control. Further investigations on other seeds were also needed to exploit the potentiality of these plant extracts.

Keywords: Fungal infection, Mustard, Plant extracts, Seed germination

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COMPARATIVE STUDY SOIL FERTILITY EVALUATION ON WATERSHED WITH THE APPLICATION OF REMOTE SENSING TOOLS AT THE RED LATERITIC ZONE OF WEST BENGAL

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Received-22.05.2024, Revised-10.06.2024, Accepted-25.06.2024

Abstract: Soil is the basic condition of all life on earth. Soil nutrients are the main source of soil fertility that promotes plant growth. Soil nutrients have become an irreplaceable resource in recent years, which should be increased due to the increase in the use of inorganic fertilizers, domestic and industrial sewage, etc. Mapping the regional variability and quality of soil nutrients is important especially when the main source of agriculture is soil fertility, remote sensing and global positioning system are the most useful tools for farming and decision making. A remote sensing database is useful for monitoring agricultural production. It provides detailed information on agricultural operations such as identification and classification of different crops, monitoring of crop condition, crop growth, area and yield estimation, mapping of soil properties and precision farming. Ten fertility estimates were analysed and mapped using a geographic information system (GIS) from a (GPS-based) soil sample collected from farmers' fields. The pH of the soil samples varied from slightly acidic to very acidic. Soil organic carbon ranged from very low to very high. Available nitrogen was low, available phosphorus was generally medium to very high and available potassium was very low to low, and sulphur was low to adequate. The nutrient map available with ArcGIS shows this clearly in some areas. The purpose of this work is to study the applications of geoinformatics to assess the availability of soil nutrients and soil fertility in precision agriculture in areas with rainfall.

Keywords: Land survey, GIS, Remote sensing, GPS, Soil fertility