



ORIGINAL RESEARCH PAPER

Agronomy

PRODUCTIVITY AND PROFITABILITY OF USING INDUSTRIAL WASTES TO REDUCE INORGANIC OF IRRIGATED SESAME

KEY WORDS: Lignite flyash (LFA), pressmud, industrial wastes

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ABSTRACT

The method of reducing fertilizer requirement for a crop is to develop an appropriate management practices. Two investigations were carried out in the farmer's field of cuddalore during 2009-12 by the industrial wastes like lignite flyash, pressmud an agro industrial by product with the objective of reducing the fertilizer need in irrigated sesame. This study revealed that Lignite flyash @ 2.5 t ha⁻¹ with pressmud exerted a remarkable influence on all the yield attributes. It significantly recorded the highest value of plant height (35cm), No. of capsules per plant (65) No. of seeds per capsule (53) and seed yield (1100kg ha⁻¹). With regard to sole application of lignite flyash, LFA @ 2.5 t ha⁻¹ registered significantly the highest values in plant height (31cm), No. of capsules per plant (57) No. of seeds per capsule (50 and seed yield (990kg ha⁻¹) for both the seasons and when the levels are increased the result on growth and yield parameters were showing declined values.

INTRODUCTION

Sesame (*Sesamum indicum*) is one of the oldest oil seed crop cultivated in India. It is called as "**Queen of oil seeds**" by virtue of its excellent quality. Among the oil seed crops, sesame ranks first for having oil content of 46-64 % and 6355 K cal kg⁻¹ dietary energy in seeds. Seeds of sesame is also rich source of protein (20-28%), sugar (14-16%) and minerals (5-7%). This oil with 85% unsaturated fatty acid is highly stable and has washing effect on cholesterol and prevents coronary heart disease. To meet this increasing demand, it becomes essential to identify the production technologies to maximise the yield in sesame.

Now, "Wastes are Resources", and they are rich in plant nutrients along with some hazardous elements. Industrial wastes can be properly combined with organic sources, so that the hazardous nature of the some elements can be minimized (Kumari mani muthu veeral, 2009). Generally lignite fly ash contains 41-63 % SiO₂, 23-32% Al₂O₃, 5.5-16.0% CaO and 3.5% Fe₂O₃. It plays an indirect role in the development of structural components thereby influencing the yield. Considering all these approaches, the research was planned with an objective of reducing chemical fertilizers in irrigated sesame by industrial wastes.

MATERIALS AND METHODS

The field experiments were conducted in the farmer's field, Neyveli. The field experiments were conducted in Sesame (VRI 1) during **February 2009 and 2012**. The weathered fly ash was collected from Neyveli Lignite Corporation Ltd., Neyveli. The press mud was collected from the sugar mill in Sethiathope, Cuddalore district. The experiments comprised of ten treatments viz., T₁ - Control, T₂ - FYM+ Lignite fly ash @ 2.5 t ha⁻¹, T₃ - FYM+ Lignite fly ash @ 5 t ha⁻¹, T₄ - FYM+ Lignite fly ash @ 7.5 t ha⁻¹, T₅ - Lignite fly ash @ 2.5 t ha⁻¹ + Press mud, T₆ - Lignite fly ash @ 5 t ha⁻¹ + Press mud, T₇ - Lignite fly ash @ 7.5 t ha⁻¹ + Press mud, T₈ - Lignite fly ash @ 2.5 t ha⁻¹, T₉ - Lignite fly ash @ 5 t ha⁻¹, T₁₀ - Lignite fly ash @ 7.5 t ha⁻¹. Experiments were conducted in Randomized block design with three replications. Observation were recorded on five plants selected at random in each replication for important characters viz., plant height, number of seeds/ capsules, 1000-seed weight and seed yield plant⁻¹. Data on growth, yield components, and yield were recorded. Standard agronomic practices were adopted.

RESULTS AND DISCUSSION

Growth Parameters

The growth parameters were significantly influenced by the

application of various levels of lignite flyash with FYM / pressmud. This result indicated the positive impact of lignite flyash on sesame. Plant height at all stages was significantly influenced by the application of lignite flyash @ 2.5 t ha⁻¹ with FYM/ pressmud in 2009-2012. Industrial wastes especially pressmud, sugar mill waste had a significant combined effect with lignite flyash @ 2.5 t ha⁻¹ on growth parameters and it may be due to the availability of more nutrients favouring the vegetative growth as reported by Kumari mani muthu veeral, 2009.

Yield Parameters

The yield parameters were significantly influenced by industrial waste application. The maximum number of capsule number per plant was recorded in LFA @ 2.5 t ha⁻¹ + Sugar mill waste @ 12.5 t ha⁻¹ (65) and which was 27 percentage increased over. Seed yield was significantly influenced by various levels of lignite fly ash applications. This was online with the findings of Kumari mani muthu veeral, 2009 that lignite fly ash has the potentiality in crop production due to its efficacy in modification of soil health and crop performance. The confirmation trail also conducted in the same season 2010, 2011 and 2012 and the same trend was followed.

Taking in to consideration, of growth, yield and yield attributes of Sesame, application of lignite flyash @ 2.5 t ha⁻¹ along with FYM/ pressmud is an eco friendly approach in minimizing the fertilizers requirement whenever industrial wastes availability is surplus.

Table 1: Effect of industrial wastes on Growth and yield attributes of Sesame (2009-12)

Treatment	Plant height (cm)	No of capsules per plant	No of seed capsules per plant	Seed yield (kg ha-1)
T1	25	51	42	770
T2	35	65	53	1105
T3	31	57	50	992
T4	29	54	47	810
T5	26	52	45	904
T6	33	58	49	943
T7	20	50	44	885
T8	22	53	46	907
T9	17	46	41	840
T10	20	50	46	848
SEm	3.0	3.2	1.0	25.3
CD P=0.05	6.1	6.4	2.02	50.6

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REFERENCES

1. Kumari mani muthu veeral, D.2009. Utilization of industrial wastes in maize based cropping system. TNSCST.Stu.pro.rep. Annamalai Univ.