

Feasibility of companion cropping of sunflower (*Helianthus annuus*) and ashwagandha (*Withania somnifera* Dunal) with various rows ratio and seed rates under rainfed condition

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ABSTRACT

A field experiment was conducted during late *Kharif* seasons of 2004 and 2005 to know the feasibility of integration of mediculture with sunflower (*Helianthus annuus*) to achieve the sustainability. The intercropping system of sunflower with ashwagandha (*Withania somnifera*) was found beneficial over sole cropping of sunflower. Among the rows ratio, either 1:6 or 1:7 of sunflower + ashwagandha was most productive and remunerative, as they recorded the maximum sunflower equivalent yield (2.76 t / ha and 2.78 t /ha, respectively), net returns (Rs.31.70 x 10³ / ha) and other competition functions. Among the seed rate levels, use of 100 % seed rate of ashwagandha was found economical.

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Key words : Ashwagandha, Companion crops, Economics, Row ratio, Seed rate and sunflower

INTRODUCTION

Sunflower (*Helianthus annuus*) is an important oilseed crops Karnataka. In the recent years, because of the occurrence viral disease and other factors, the production is being affected. Intercropping is one of the well known systems for reducing the risk. Off late, cultivation of medicinal crops is gaining importance because of its higher returns with less input. Hence, cultivation of medicinal crop as a component crop in companion cropping system not only increases harvest per unit land, increases generation of employment but also reduces the risk of agriculture crops. Ashwagandha (*Withania somnifera* Dunal) a long duration medicinal crop differs morphologically and physiologically in growth habits with sunflower is thought off to grow as a component crop in sunflower + ashwagandha system. Research work on this aspect is lacking. Hence, the present investigation was undertaken to know the feasibility of growing ashwagandh with sunflower.

MATERIALS AND METHODS

Field experiments were conducted at Regional Agricultural Research Station, Raichur (latitude 16^o 15¹ N and longitude of 77^o 20¹ E), Karnataka during late *Kharif* seasons of 2004 and 2005 on medium black soil

under rainfed condition. The soil of the experimental field was low in available nitrogen (231 kg/ha) medium in available in phosphorus (24.8 kg/ha) and high in available potassium (394 kg/ha) with pH 8.3. The bulk density of the soil was 1.34 with field capacity of 36% and permanent wilting point of 12%. The moisture content at the time of sowing was 30%. There were twelve treatments (T₁ : Sole sunflower (SF) (60 cm x 30 cm); T₂ : Sole Ashwagandha (AG) (15 cm x 15 cm); T₃ : SF (60 x 30 cm) + AG (1:3): 100% recommended seed rate of AG (RSAG); T₄ : SF (60 x 30 cm) + AG (1:3): 50% RSAG; T₅ : SF (75 x 24 cm) + AG (1:4): 100% RSAG; T₆ : SF (75 x 24 cm) + AG (1:4): 50% RSAG; T₇ : SF (90 x 20 cm) + AG (1:5): 100% RSAG; T₈ : SF (90 x 20 cm) + AG (1:5): 50% RSAG; T₉ : SF (105 x 17 cm) + AG (1:6): 100% RSAG; T₁₀ : SF (105 x 17 cm) + AG (1:6): 50% RSAG; T₁₁ : SF (120 x 15 cm) + AG (1:7): 100% RSAG; T₁₂ : SF (120 x 15 cm) + AG (1:7): 50% RSAG were tested in a Randomized Block Design with three replications. Sunflower (sole) was supplied with 35-50-35 kg N- P- K/ha at the time of sowing. For sole ashwagandha 12-24 kg N-P /ha was applied at sowing. No additional nutrients were given to the ashwagandha. The sunflower hybrid KBSH-1 and Jawahar asgandh-20 of ashwagandha cultivar were used in the experiment. The crops were sown on 9 September 2004 and on 27

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