Journal of Applied Biosciences 16: 862 - 863
ISSN 1997–5902

Effect of planting date and density on the yield and yield components of milk thistle (*Silybum marianum,* L.)

Shamsi, K.
Islamic Azad University, Kermanshah Beranch, Iran.
Department of Agronomy, Islamic Azad University,
P.O. Box 67155-1774; Baghe nai Street; Kermanshah, Iran

Corresponding author email: shams2_k@yahoo.com

Published at www.biosciences.elewa.org on 4th April 2009.

ABSTRACT
Objective: Silybum is an annual plant that grows in many European and Asian countries and has medicinal use, e.g. curing some kidney and liver diseases. This study determined the effect of planting date on phenological development and yield components of Silybum.
Methodology and results: A factorial experiment was done in the research field of the Agricultural College of Kermanshah (Iran). The planting date (factor A) was assessed at three levels (29th March, 25th April and 20th May,) while density (factor B) was set at three levels (40, 50, and 60cm spacing). Results indicated that height of plant, number of capitols per plant, grain yield and 1000 - grain weight, were all affected significantly by variations in planting dates (P≤0.01). Results also showed that density levels tested had no significant effect on the evaluated parameters.
Conclusion and application of findings: Overall, the field experiment showed that maximum height, number of capitols per plant, grain yield and 1000 - grain weights were mostly related to the first planting date (29th March).

Key words: silybum, planting date, planting density, yield, yield components.

INTRODUCTION

The Middle Zagros zone in Iran in which Ilam, Kurdistan, Kermanshah, Lorestan and Hamadan provinces are located provides suitable conditions for growth of various plants including medicinal ones. The area has good and diverse climatic conditions and extensive range and sylvan areas (5,263,544 ha range; 1,130,393 ha forest) (SamsamShariat, 1993). The Milk thistle plant is an annual Mediterranean plant that grows on plains with a warm weather and on light sandy soils. This plant is widely cultivated due to its importance in treating biliary and digestive system diseases, as well as curing liver diseases and preventing liver cancer (Solgi, 2000; Carmen Tamayo, 2007).

Significant factors that need to be considered to attain maximum yield of agricultural plants include optimum planting and density patterns. During an experiment, Omidbaigi (1997) studied 3 milk thistle cultivars and assessed several plant growth traits, e.g. plant height, number of capitols per plant, grain yield, and production of effective substances, e.g. silimarine and silibine. The quality of effective substances produced by wild and improved cultivars of the plant were observed to vary significantly with 0.8 and 1.8 Ton/ha yields for wild Chaloos and improved Majarestan cultivars, repectively (Omidbaigi, 1997; ZareeNiai *et al.*, 2001).

Abdali *et al*. (1998) investigated the effects of different density levels on the yield and grain oil volume of medicinal Milk thistle plant under Ahwaz climatic conditions and concluded that although density of 80000 plants/ ha increased the grain yield slightly; different density levels have no meaningful effect on oil content. The objective of this study was to determine the effect of density and planting data on phenology and yield of *Silybum. marianum*.

MATERIALS AND METHODS

The experiment was carried out as a factorial design laid out as complete random blocks with 3 repeats on at the research field of Kermanshah Agriculture College, Iran. The two factors were row spacing at 40, 50 and 60 cm; and planting date on 29th March, 25th April and 20th May.

Plant height, number of capitols per plant, duration of growth period, duration of flowering period, capitol diameter, and 1000- grain weight were measured from planting to harvesting time. To measure grain yield, one linear meter was separated from 3 middle rows of any plots and harvesting done on 3 separate dates due to non-uniform flowering and possible shedding.

RESULTS AND DISCUSSION

There was a highly significant difference ($P \leq 0.01$) among the different planting dates in terms of its effect on plant height, number of capitols per plant, grain yield, and 1000- grain weight. Variations in row spacing did not significantly affect plant growth and yield.

Plant height was highest for those planted on the earliest date (29th March) and least for the latest planting date (20th May). With respect to grain yield, the first planting date exhibited superiority compared to the other dates.

The first and second planting dates were better than the third one in terms of 1000- grain weight, and one reason for this was higher number of capitols per plant. There was no significant difference between the first and the second planting dates in relation to the weight of 1000 grains. Correlation among the studied qualities showed that the yield and the weight of 1000 grains increased with increasing plant height and number of capitols per plant.

The duration of flowering period 16, 15 and 15 days for the first, second, and third planting dates, respectively, while the duration of the growth period was 127, 117 and 112 days, respectively. The longer duration of growth period for the first planting date is due to low temperature during this period. As the temperature gradually rises, the duration of growth period falls, as was observed for the later planting dates. The field experiment showed that according to the climatic condition, seed must be planted as early as possible. In this investigation, the best date of planting is29March.

REFERENCES

Abdali M, Fathi Gh. and AlamiSaeed K, 1998. Evaluating the effects of different density levels on the yield and grain oil volume of medicinal Milk thistle plant under Ahwaz climatic conditions. In: Proceedings of the sixth congress on crop production and plant breeding. Iran.

Carmen Tamayo,M.D, 2007.Review of clinical trials evalution safety and efficacy of milk thistle (*silybum marianum* L.). Integrative cancer Therapies .6(2):146- 157

Omidbaigi R, 1997. Investigating silimarine and silibin production in Milk thistle plant comparing seeds from wild and improved agricultural seeds. Iranian J. Agric. Sci , 2:413-421.

Solgi M, 2000. The position of west provinces in medicinal plants. Agricultural production. In: Proceeding of first congress on medicinal plants, the west region, Iran.

SamsamShariat H, 1993. Cultivating and reproducing medicinal plants. Mani Press, Iran.

Zaree Nia S, Omidbeigi R, and Erfanzadeh R, 2001. investigation of some ecological charactristics of Milk thistle (*Silybum marianum*) in Behdasht region of Noor . M.Sc Thesis in pasture crops. College of Teacher- Training University, Tehran, Iran.