Effect of sowing date and intercropping on grows, performance and quantitative and qualitative characteristics of medicinal plants Ajwain *(Carum copticum L.*) and German chamomilla (Matricaria chamomilla).

Abstract

In order to investigate the effect of sowing date and intercropping ratio of *Carum copticum L.* and *Matricaria chamomilla* on the growth and yield of quantitative and qualitative traits of these two plants, an experiment was conducted in a research farm of the Faculty of Agriculture, University of Zabol, located on the new campus (Km 2 of Bonjar Roads), in the form of split plot in a randomized complete block design with three replications (split plot design). The main factor included two sowing dates, December 15 (A1) and January 15 (A2), and the six-cropping system were considered as secondary factors as follows: sole crop of *Carum copticum L* (B1), sole crop of Matricaria chamomilla (B2), 25% chamomilla +100% Carum copticum L (B3), 50% chamomilla +100% Carum copticum L (B4), 75% chamomilla +100% Carum copticum L (B5), 100% chamomilla +100% Carum copticum L (B6). The intercropping system was incremental. The results of data analysis confirmed the significant effect of sowing date on seed yield, seed thousand weight, and plant height (in both plants), weed dry biomass and weed number. The highest plant height and essential oil yield (in both plants) were related to the first sowing date (A1) and also the highest seed thousand weight, seed yield and biological yield of Carum copticum L. were obtained from sowing date of A1. With delay in planting (second sowing date A2), the harvest index, essential oil weight and essential oil percentage in the Carum copticum L. plant, and the number of main stems of the Matricaria chamomilla plant increased. The results of analysis of essential oil components showed that the highest percentage of Thymol was obtained from the first sowing date (A1). And the highest percentage of α-Terpinene, ß-pinene, P-Cymene and o-cymene were obtained from A2 sowing date. A1 sowing date could reduce total weed biomass and total number of weeds by 3 and 15 percent compared to A2 sowing date. The results of intercropping ratios showed that pure cropping of Carum copticum L. had the highest grain yield, biological yield and highest percentage of essential oil, essential oil weight and essential oil yield. The highest plant height was obtained from the intercropping ratio. The total biomass of weeds and number of weeds affected by intercropping ratios were significant. In terms of controlling and managing weeds, the highest intercropping ratio had the lowest dry weight biomass of weeds. The evaluation of intercropping indicated the superiority of intercropping compared to pure cropping in all mixing ratios in such a way that LER was larger than one in all treatments. The minimum amount of light was obtained from pure cropping of Carum copticum L. and Matricaria chamomilla and the highest moisture content and soil temperature were obtained from pure B1 and B2 treatment of Carum copticum L. and Matricaria chamomilla.

Keywords: Sowing date, Intercropping, Yield, Essential oil yield, Weeds.

University of Zabol
Graduate school
Faculty of Agriculture
Department of Agronomy

The Thesis Submitted for the Degree of Master of Science (in the field of Horticulture Science)

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Supervisor:
Dr. A. Ghanbari

Advisors:
Dr. M. Khaje

By:
Ali Akbar Mahmoudi

September 2017