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Effects of biofertilizers on quantitative and qualitative yield of chamomile (*Matricaria recutita*) as a medicinal plantJ. Fallahi¹, A. Koocheki², P. Rezvani Moghaddam³¹Department of Ecology, ²Department of Agroecology, Ferdowsi University of Mashhad, Iran

Fertilizer management is one of the most important factors in successful cultivation of medicinal plants. Fertilizers can affect the quality and quantity of plant indexes. Chamomile is one of the oldest medicinal plants that have been using by human since ancient time. In order to study the effect of biofertilizers on quantity and quality yield of Chamomile, an experiment was conducted at Research Station, College of Agriculture, Ferdowsi University of Mashhad, Iran, in year 2008. A complete randomized block design with three replications was used. The treatments were: nitroxin biofertilizer (*Azotobacter sp* + *Azospirillum sp*), phosphate solubilizing bacteria and nitroxin biofertilizer + phosphate solubilizing bacteria. Result showed that these treatments had significant effects on main shoot, number of flower per plant, diameter of flower, fresh flower yield, dry flower yield, seed yield, essential oil and chamazulene yield. The highest fresh and dry flower yield was observed in nitroxin and phosphate solubilizing bacteria. The highest essential oil and chamazulene yield per hectare were obtained in phosphate solubilizing bacteria (8600g) and nitroxin (923g) treatments, respectively. Moreover, the lowest fresh and dry flower yield, essential oil and chamazulene yield per hectare related to the nitroxin biofertilizer + phosphate solubilizing bacteria treatment. It seems that biofertilizers can consider as a replacement for chemical fertilizers in chamomile medicinal plant production.

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Effect of harvesting date on quantitative and qualitative characteristics of seedless barberry (*Berberis vulgaris*) fruitJ. Fallahi¹, P. Rezvani Moghaddam², M.N. Mohalati¹Department of Ecology, Ferdowsi University of Mashhad, ²Department of Agroecology, Ferdowsi University of Mashhad, ³Department of Food Sciences, Faculty of Agriculture, Ferdowsi University of Mashhad, Iran

Seedless Barberry (*Berberis vulgaris*) is one of the endemic and valuable shrubs that grow as a garden crop only in Iran. In order to study the effect of different harvesting dates (9 September, 1 October, 22 October and 12 November) on quantitative and qualitative characteristics of seedless Barberry, an experiment was carried out based on Complete Randomized Block Design with 3 replications at the Southern Khorasan province in 2008. Results showed that different harvesting dates had a significant effect on fresh fruit yield with branch, fresh fruit yield without branch, branch fresh weight, dry fruit yield, 100 fresh fruit weight, 100 dry fruit weight, pH, brix, acidity and anthocyanin indexes. The highest and the lowest fresh and dry fruit yield were obtained at final harvesting date (12 November). Moreover, with delaying in harvesting date the brix, pH and anthocyanin indexes were increased but acidity was decreased. The result of correlation coefficient showed that there was a positive correlation between pH and soluble solids content in extract. But correlation coefficient between pH and acidity was negative. Furthermore, correlation of anthocyanin with brix and pH was positive and

its correlation with acidity was negative. Our results showed that the best harvesting date was 12 November that improved qualitative and quantitative indexes of seedless barberry for the studied region.

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Variability of morphological characteristics in *Agrimonia eupatoria* L. In the Czech republic

K. Dušek, E. Dušková, K. Směkalová

Department of Vegetables and Special Crops Olomouc, Crop Research Institute, 783 71 Olomouc, Czech Republic

Agrimony (*Agrimonia eupatoria* L.) is one of the medicinal plants, which are perspective for recultivation of flowering meadows in the area of the Czech Republic. Detail knowledge about each used genus is necessary before the producing of seed mixtures for such recultivation. The variability of morphological characters was studied as a first step of agrimony cognition. Ten particular Czech populations of this genus were studied in the field nursery and even after 2 years of cultivation in identical conditions there were found statistically significant differences in morphological characters. 281 plants were studied in total and high of plants was determined between 37 and 175 cm. Width of plants achieved between 13 and 122 cm, leaves were 6 – 37 cm long and 4 – 20 cm width. Length of inflorescences was measured between 8 and 116 cm.

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Changes in essential oil content of dill (*Anethum graveolens* L.) Organs in response to water deficitK. Ghassemi-Golezani¹, B. Andalibi², S. Zchtab-Salmasi¹, J. Sabu²¹Department of Agronomy and Plant Breeding, Faculty of Agriculture, University of Tabriz, Tabriz, ²Department of Agronomy and Plant Breeding, Faculty of Agriculture, University of Zanjan, Zanjan, Iran.

Although the secondary metabolite production is believed to be stimulated by stressful environment, there is too little experimental data to support this notion. Therefore, two experiments were conducted in 2006 and 2007 at the Research Farm of the University of Zanjan, Iran, to evaluate the effects of water deficit during vegetative and reproductive stages on essential oil content of dill organs. The experiments were arranged as split-plot, based on randomized complete block design with four replications. Irrigation treatments and plant organs (leaves, flowers and seeds) were assigned to the main and sub-plots, respectively. The essential oil of the plant organs were separately isolated by hydro distillation. The results of combined analysis of variance indicated that the percentage and yield of essential oil were significantly ($P \leq 0.01$) affected by water stress and harvested organs. The essential oil content of seeds and flowers was much higher than that of leaves under all irrigation treatments. The essential oil percentage of dill flowers and seeds was increased with decreasing water availability. However, the highest essential oil yield per unit area was obtained under moderate water stress. Thus, essential oil yield of dill could be improved by a moderate water stress during reproductive stages.

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Effect of nitrogen rates on qualitative traits and seed yield of fennel (*Foeniculum vulgare* mill.) Accession