

THE INFLUENCE OF PHYTOSANITARY TREATMENTS AND FERTILIZERS UPON *CHRYSANTHEMUM* CULTIVARS

INFLUENȚA TRATAMENTELOR FITOSANITARE ȘI A FERTILIZĂRILOR ASUPRA SOIURILOR DE CRIZANTEME

*BUTA Erzsebet*¹, *CANTOR Maria*¹, *BUTA M.*¹
e-mail: ebuta2008@yahoo.com

Abstract. *In the flower market demand grows, so it grows massively the imports of flowers, including the genus Chrysanthemum, who occupies an important place. By increasing competition, the producers in our country are ever more affected financial. Chrysanthemum cultivation importance derives from its esthetic qualities, what make it to match for any occasion, also the diversity of shapes, sizes and colors, the suitability for modern homes makes the chrysanthemum to be highly appreciated by the general public, and in the same time to be economical a profitable crop. In this study was experienced the behavior of some Chrysanthemum multiflora varieties, regarding the effect of protection and nutritional substances. During the experiences were made some observation and determination on the difference in plants development, degree of flowering, the resistance for diseases and pests, and finally the selling price, according their quality. At the obtained data was made their average and were statistically interpreted, using the results obtained, which can lead to some conclusions on low or not, the dose administration of these substances, and ultimately decrease production cost. The best results were registered at the variants which was benefit of phytosanitary treatment and fertilizers.*

Key words: daisy cultivars, nutrition, protection, profitability.

Rezumat. *Cererea pe piață a plantelor floricole crește, astfel cresc masiv și importurile de flori, între care genul Chrysanthemum ocupă un loc important. Prin creșterea concurenței, producătorii din țară sunt afectați din ce-n ce mai mult financiar. Importanța cultivării crizantemei derivă din calitățile sale estetice ce o fac să se potrivească pentru orice ocazie, iar diversitatea de forme, mărimi și culori, pretabilitatea pentru locuințe moderne, fac ca crizantema să fie foarte apreciată de marele public și în același timp din punct de vedere economic, să fie o cultură rentabilă. În această lucrare s-a studiat compararea unor soiuri de Chrysanthemum multiflora, cu privire la efectul aplicării sau suspendării substanțelor de fitoprotecție și nutriție. Pe parcursul desfășurării experiențelor s-au efectuat observații morfologice, s-au înregistrat date cu privire la creșterea și dezvoltarea plantelor, rezistența la boli și dăunători și ulterior privind prețul de valorificare și calitatea producției. Datele obținute au fost interpretate statistic. Rezultatele obținute arată că aplicarea sau suspendarea tratamentelor fitosanitare și a fertilizanților determină în mare măsură calitatea producție și costul produsului finit. Cele mai bune rezultate s-au înregistrat la variantele care au beneficiat atât de tratamente fitosanitare cât și de nutriție.*

Cuvinte cheie: soiuri de crizanteme, nutriție, calitate, profitabilitate.

¹ University of Agricultural Sciences and Veterinary Medicine Cluj-Napoca, Romania

INTRODUCTION

The *Chrysanthemum* has been cultivated in China for more than 2500 years and was a favorite flower of the Mandarins (Swift, 2003). The flower may have been brought to Japan in the 8th century, and the Emperor adopted the flower as his official seal. There is a "Festival of Happiness" in Japan that celebrates the flower.

In Europe appears in the 18th century, for the first in France. Intensively was cultivated by Blanchard horticulturist beginning with 1789, in England.

The range of types is wide also includes the outdoor *Chrysanthemum* (also known as border and early-flowering chrysanthus) and greenhouse chrysanthus (also known as late-flowering mums). Greenhouse types include flowering pot plants which are usually "Dwarf" varieties as well as "Charm" varieties. "Incurved" varieties have flowers with florets that turn towards the center, thereby creating the impression of ball. Reflexed types have florets that turn outwards and downwards (Swift, 2003). Incze (1964) described 12 types of mums: Simple, Half dense, Pompon, Flat, Half globe, Globe, Ruffle globe, Cannular, Spoon, Needle-like, Thorn-like, and Spider. The flowers also can be daisy-like, decorative and buttons (Cantor, 2005).

Today the chrysanthus has another international classification system with 13 types: Irregular incurve, Reflex, Regular Incurve, Decorative, Intermediate Incurve, Pompon, Single/Semi-Double, Anemone, Spoon, Quill, Spider, Brush & Thistle, Exotic (<http://en.wikipedia.org/wiki/Chrysanthemum>).

This genus contains many hybrids and thousands of cultivars developed for horticultural purposes. In addition to the traditional yellow, other colors are available, such as white, purple, and red. The most important hybrid is *Chrysanthemum* × *morifolium* (syn. *C.* × *grandiflorum*), derived primarily from *C. indicum* but also involving other species.

Regarding the propagation, mums can be easy propagating by cuttings. In 1982 Pasquier *et al.*, have compared several culture media (peat moss, perlite, fine pine bark shavings, rough pine bark shavings and a mixture of rough pine bark and peat) for rooting and growth of pot *Chrysanthemum* cuttings obtained on the commercial market: *Chrysanthemum morifolium* Ramat cv 'Always Pink'. The rooting was earlier in perlite and peat moss than in other substrates.

This hardy perennial is most useful: this flower very late in the season and make large clumps by slow-spreading, short stolons. In landscape design can be combined with different grasses, *Perovskia*, *Fuchsia magellanica*, *Sedum*, *Aster*, *Solidago* and *Salvia* (Carter, 2007).

MATERIAL AND METHOD

Experiences regarding the influence of phytosanitary treatments and fertilizers upon grown and development of chrysanthus cultivars, were made at a private company from Covasna County, in 2009. The studied *Chrysanthemum multiflora* cultivars were: **Filmstar**, **Mermaid Yellow** (fig. 1), **Musi Jaune**, **Titane Rouge** (fig. 2), **Tonka Rose Lilas** and **Yahou Lilas** (fig. 3). The cuttings have been brought from a

german private company: Brandkamp.

The rooting substrate was „Plantaflor”, compound by well decomposed black peat with half decomposed brown peat, macro and micro elements. The pH was between 5.2-6.

After the rooting of cuttings they were transferred into another substrate: „Plantobalt”.

It was applied the classical pot technology, and the plants were conducted to obtained flowers in autumn (September-October). Experimental variants were organized on four groups. The first and the second group benefit of facial fertilization with Complex III and OsmocotePro. At the first and third group were administrated phytosanitary treatments in the next combination: Previcur + Mospilan și Novoziv + Decis. The phytosanitary treatments were applied weekly. In the case of four groups does not apply any fertilizer or phytosanitary treatments (it was considered the experience control).

Most frequently problem at four groups was created by *Puccinia horiana*, *Tetranychus urticae* and *Aphididae*.



Fig. 1 - Filmstar and Mermaid Yellow cultivars

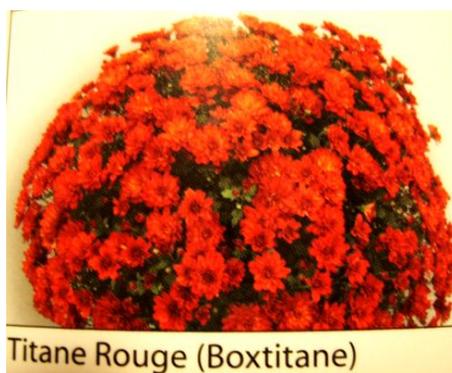


Fig. 2 – Musi Jaune and Titane Rouge cultivars

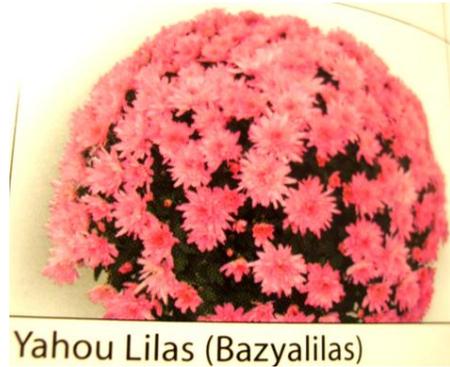


Fig. 3 –Tonka Rose Lilas and Yahou Lilas cultivars

RESULTS AND DISCUSSIONS

The recorded data concerning the influence of phytosanitary treatments and fertilizers upon grown and development of chrysanthemums cultivars were statistical interpreted with „t” test. It is remarkable the superiority of first group, which benefit of water, nutrition substances and phytosanitary treatments. Plants were healthy, vigorous, and compact with typical characteristic of cultivars.

At the second group which benefits of water, nutrition substances without phytosanitary treatments it is manifest a massif attack of *Puccinia horiana* (white rust). Due to good supply of nutrients this attack did not externalize very strong.

At the plants of the third group which benefit of water and phytosanitary treatments without nutrition substance was observed inflorescence defects (small in size and number), less compacted bushes and leaves yellow at the base.

Plants that have been studied in group IV, which received only water, showed a very thin shoot, flower buds appeared 3 weeks later than the plants in group I. There was a massive attack of *Puccinia horiana*, *Tetranychus urticae* and *Aphididae*.

Table 1

Summarize table of the shooting capacity of the chrysanthemums cultivars

No. of group	Experimental variants	No. of principal shoots	± d (shoots/ plant)	Value t	Signification of difference
IV.	Water (Control)	5 ± 0,32	-	-	-
III.	Water + phytosanitary treatments	7 ± 0,26	+ 2	11,7	***
II.	Water + fertilizers	11 ± 0,26	+ 6	54,5	***
I.	Water + phytosanitary treatments + fertilizers	12 ± 0,14	+ 7	70	***

Table 1 show that all experimental variants shoot very well regardless the applied treatment. It was remarks high values at the plants of group I, which exceed the control with a difference of 7 shoots.

Regarding the number of flowers per plants it was recorded positive significant differences at all experimental variants. Group I exceed the control of the experience with a difference of 51 flowers / plant. Relatively close values are presented at group II (table 2).

Table 2

Summarize table regarding the number of flowers/shoot at chrysanthemums cultivars

No. of group	Experimental variants	No. of flowers/ plant	± d (flowers/ plant)	Value t	Signification of difference
IV.	Water (Control)	45 ± 0.24	-	-	-
III.	Water + phytosanitary treatments	52 ± 0.29	+ 7	50	***
II.	Water + fertilizers	80 ± 0.26	+ 35	250	***
I.	Water + phytosanitary treatments + fertilizers	96 ± 0.36	+ 51	364.3	***

Table 3

Summarize table regarding the high of plants at chrysanthemums cultivars

No. of group	Experimental variants	High of plants (cm)	± d (high of plants)	Value t	Signification of difference
IV.	Water (Control)	20 ± 0.23	-	-	-
III.	Water + phytosanitary treatments	26 ± 1.06	+ 6	5.5	***
II.	Water + fertilizers	30 ± 1.04	+ 10	9.3	***
I.	Water + phytosanitary treatments + fertilizers	36 ± 0.36	+ 16	36.6	***

Table 4

Summarize table regarding the diameter of rosette at chrysanthemums cultivars

No. of group	Experimental variants	Diameter of rosette (cm)	± d (diameter of rosette)	Value t	Signification of difference
IV.	Water (Control)	3 ± 0.13	-	-	-
III.	Water+ phytosanitary treatments	4 ± 0.2	+1	4	***
II.	Water+fertilizers	6 ± 0.16	+3	18.7	***
I.	Water+ phytosanitary treatments +fertilizers	6 ± 0.16	+3	18.7	***

Studying the plant height, it was registered a very good vigor of plants in group I, which showed a very significant difference of 16 cm, this exceeded the control of experience (table 3). As the diameter of rosette, groups I and II show the same level exceeding with 3 cm the control of experience. All variants have achieved very significant differences regarding the control (table 4).

CONCLUSIONS

1. At the first group plants were healthy, vigorous and exceeded the control in each case.

2. Plants from second group has superior characteristics, but appears white rust, due to good supply of nutrients this attack did not externalize very strong.

3. In the case of third group, which has only phytosanitary treatments was observed some deficiency of flowering, inflorescence was small, less compacted bushes and leaves were yellow at the base.

4. At the four group were observed the importance of phytosanitary treatments and fertilizers because the plants from this group has a lower development and resistance, buds appears later with 3 weeks than plants of first group, it shows flower deficiency, inflorescences were small. It is presented disease (white rust) and pests (spiders and aphids).

5. The higher profitability was registered in the case of first group.

REFERENCES

1. **Carter Susan, C. Becker, L. Bob, 2007** - *Perennials: The Gardener's Reference*. Timber Press, Inc;
2. **Cantor Maria, Ioana Pop, 2005** - *Floricultură Specială ~ Baza de Date*. Ed. AcademicPres;
3. **Incze F., 1964** - *A krizantén*. Mezőgazdasági Kiadó, Budapest;
4. **Pasquier, P. A. Anstett, A. Amiraux, 1982** - *Effect of the rooting substrate on rooting, growth and flowering of Chrysanthemum morifolium* Ramat. ISHS Acta Horticulturae 125: Symposium on Chrysanthemum, Versailles, France, ISBN 978-90-66050-91-4;
5. **Swift D., 2003** - *American's favorite flowers*. Ed. Gramercy Books, New York;
6. *******, <http://en.wikipedia.org/wiki/Chrysanthemum>;