UDC 633.88: 631.527

Melnychuk R.,
Experimental Station of Medicinal Plants of the Institute of Agroecology and Nature Management of NAAS Scientific adviser - candidate of biological sciences R.L. Boguslavskiy

Initial material for selection of calendula (Calendula L.) for suitability to mechanical harvesting of racemes*

The purpose. To determine initial material for creating grades of calendula, suitable for mechanical harvesting. Methods. Field, laboratory, mathematical and statistical. Results Characteristics of gene pool of samples of calendula are resulted according to their fitness for mechanical harvesting. Conclusions. Collection samples are arranged on a branchiness in 3 groups. The 3-rd group is fixed as perspective for further selection operation. Samples C.o.-99-3 and grade Radio are determined as the most perspective ones.

Key words: calendula, collection, sample, character, mechanical harvesting.

Medicinal Medicines (Calendula officinalis L.) - one of the large-scale crops, which has multilateral use all over the world, their raw materials (inflorescence, root, all the plants) are used in the chemical and pharmaceutical, food, paint and varnish industries, cosmetics, landscapes Design and in veterinary practice. In the European countries, among medicinal crops, the second-largest land is used for sown fields, and only chamomile is medicinal. They are widely cultivated in Australia, Russia, and the USA [8]. In Ukraine, medicinal herbs are grown on an area of about 300 hectares, both for seeding needs and for obtaining raw materials that are not enough for the pharmaceutical industry [Z, 7]. Raw material (inflorescences) are collected mainly by hand. In practice, grassland harvesting machines USK, RM-1,4, OS-2,8, VZR-4 are used. However, the essential disadvantage is that the raw material requires additional manual sorting or the use of special sorting machines [4, 8]. Signs that make it more suitable for harvesting inflorescences with harvester combines include: less branchiness, a small number of shoots and a short flowering period. Suitable varieties for mechanized harvesting of inflorescences are in Russia - Kalta, Ryzhik; Great Britain - Orange King; Germany - Erfurter Orangefarbige; Slovakia - Plamen and Plamen plus [3, 9, 10]. Currently, there is not a single grade of Medicinal Herbs in the Register of Varieties of Ukraine [1]. One way of widespread introduction of culture is to create a variety that is suitable for mechanized harvesting and has high yield and quality of raw materials. The purpose of the research ■ - to isolate the source material according to the morphological and economically useful features for the creation of a variety suitable for mechanized harvesting. Materials and methods of research. 31999 at the Experimental Station of Medicinal Plants, the drawing of samples and the formation of a collection of the genus Calendula L. was started. The research was conducted during 2011-2013. 62 specimens from 12 countries of the world belonging to 4 species were studied: Calendula officinalis L., C. arvensis L., C. tripterocarpa Rupr., C. alata Rech., Among which 27 varieties of versatile use. By geographical origin, the largest samples were from Ukraine - 20, from Germany - 14, from Russia - 13, from Italy - 3, by Kazakhstan, Poland, the United Kingdom and the USA - by 2 samples and by the 1st sample from Bulgaria, India, Libya, Mongolia . Field experiments were laid in accordance with the generally accepted techniques given by BO Dospehovy [2], and for medicines marigolds - G.S. Lewandowski [5]. The sowing was carried out in optimum terms (III decade of April) with a manual drill at a depth of 2 cm. The plots were single row with a length of 2 m with an intermediate row of 45 cm without repeats. Phenological and biometric measurements, estimation of samples of the collection of marigolds on national and biological grounds were carried out in accordance with the methodology of O. A. Porea [6]. According to this method, the yield of raw materials was recorded by sampling from 10 plants, and after being dried, the conversion was made on a crop of 1 hectare.

During the mathematical processing of experimental data, the computer program ANOVA [2] was used. Research results. For characteristics of suitability for mechanized harvesting, a set of features was taken into account: the number of shoots, the number of shoots of all orders, the height of plants, the diameter of the bush, the period of flowering and the airspace of dryweight inflorescences per 1 ha. Samples with less branchiness, a small number of shoots and a short period of flowering are the most promising for the harvesting of inflorescences by harvester harvesters. According to the records and measurements, the collection of marigolds was divided into 3 groups according to the total number of shoots of all orders: 1 - with a large number of shoots (more than 60 pieces), II - with an average number (30-60 units), Ill - With a small amount (up to 10 pcs.). Group I consists of 8 specimens, of which 2 varieties (Surgeon, Erfurter Orangefaberg), 2 belong to other species (C. arvensis (C.agr. 11-33) and C. tripterocarpa (C.t.-11-34)). By appearance - 3 samples from Ukraine and one in Bulgaria, Italy, Libya, Germany and Russia. The average number of shoots in the samples is 62-113, the number of shoots is 3.9. The height of specimens within the group is 37.3-48.6 cm, the diameter of the bush is 23.4-58.3 cm, the flowering period is 36-60 days, the yield of airborne inflorescences is 0.34-1.55 T / ha Characteristics of typical group representatives (table) are defined.

Characteristics of samples for a set of features

The analysis of the relationship between the signs testifies to the weak link (r = 0.24) of the number of shoots with height. Group II is the largest of 29 samples, of which 12 varieties (Golden Bute, Juwel, Sunshine, Indium Prints, Orange Porcupine, Radio, Geisha Girl, Nancy, Apricot Beauty, Monarch orange, Field Beauty, Orange Gitana). The rest of the samples are sampled from the populations. By origin, the group is most represented by samples from Ukraine (9), from Germany and Russia - by 6 samples, from the UK and Italy - 2 samples and by 1 sample from Poland, India, Mongolia and the USA. The average number of shoots in specimens is 31 -58, the number of shoots is 3.4, the height of the specimens is 18.6-49.6 cm; Diameter of the bush - 23,8-45,1 cm; The period of flowering - 43-62 days, yield of airborne inflorescence - 0,56-2,14 t / ha. The most recent representatives of the group were identified (see table). The results of the analysis of the relationship between the signs indicate an average correlation (r = 0,42) between the branchiness and height of plants and a weak correlation between the galility, on the one hand, and the diameter of the bush (r = 0 , 13) and the number of shoots (r = 0.11), on the other. Group III includes 25 specimens, including 13 varieties (Fiesta gitana, Sherbet, Cremgell, Kalta, Flashback mix, Apricot Pygmy, Tutti Frutti, California, Green Heart, Touch of red, Pannochka, Orangestrahlen, Kablouna); 1 belongs to a related species (S. alata, C.al.-11-32). Other samples are samples from populations. The average number of shoots in specimens is 12-29, the number of shoots is 3. The height of the plant within the group is 16.5-49.5 cm, the diameter of the bush is 18.7-44.9 cm, the flowering period is 32- 62 days, the yield of poultry-dried inflorescence is 0.25-1.92 t / ha. Originally from Ukraine - 8, from Germany - 7, Russia - 6, Kazakhstan - 2, and one from Poland and the USA. The parameters of the group's default agents are determined (see table). The analysis of the relationship between branchiness, on the one hand, and the diameter of the bush, the height of plants and the number of shoots on the plant, on the other hand, has an average correlation (respectively, g = 0.67; g = 0.44 and r = 0.39). According to the results of the analysis of the correlation between these features, it has been pre-established that it is more efficient to obtain per-spective samples by the number of shoots among high-growth specimens. According to the results obtained, the specimens were identified for use as a source of selective signs: for the height of plants - the grade Radio (Group II, S.-04-26, Germany), So-99-3 (Group III , Poland) and SO-03-13 (Group II, Germany) - respectively 49.4 cm, 49.5 and 49.6 cm; The diameter of the bush - varieties of group III from Russia - Tutti Frutti and Apricot Pygmy - respectively 18.7 and 20.8 cm; Flowering period - SO-03-20 (Group I, Libya), SO-03-13 (Group III, Germany), SO-99-1 (Group III, Kazakhstan), molds Within 47 days; The yield of air-dry inflorescences is Co-99-C (Group III, Poland) and varieties of Group II - Solar beam (Russia) and Radio (S.o., 04-26, Germany), which rates were respectively 1.92 t / Ha, 2,11 and 2,14 t / ha. Since the determining indicators for the mechanized harvesting of inflorescences of medicinal

herbs are the number of shoots, branchiness and flowering period, the third group of specimens is the most promising for use in the breeding process. The data obtained from the preliminary evaluation of samples of the collection of the genus Calendula L. are important for the use of cutting machines.

Conclusions

The models of the III group, which are characterized by the lowest indices of branchiness, number of shoots and short period of flowering, are promising for use in the lecture program on the suitability for mechanized harvesting. The shortest growing season has samples of C. tripterocarpa Rupr., C. alata Rech, and C. arvensis L. of Ukrainian origin, which matured for 31, 32 and 40 days respectively, but did not belong to the pharmacopoeia of Calendula officinalis L. Prospective Samples of the number of shoots to some extent need to be among the high-growth samples. The most promising samples are S.O., -99-3, Group III, and S.O.-04-26 (Radio type) of the II group, which had a height of more than 49 cm, a bush diameter - to CO cm, a flowering period of about 50 days, and High yield of air dry powder inflorescences - respectively 1.92 and 2.14 t / ha. They combine quite high yield and suitability for mechanized harvesting.

Bibliography

1. State register of plant varieties, suitable for distribution in Ukraine in 2014 (http://vet.gov.ua/ sites / default / files / ReestrEU-2014-06-16. Pdf).

2. Armor B.A. Method of field experiment / B.A. Armor - M .: Kolos, 1985. - 365 pp.

3. Ismagilov P.P. Kalendula / R.R. Ismagilov, D. A. Kostylev. - Ufa: BGUU, 2000. - 102 p.

4. Martynov Yu.F. Technology of medicinal raw material production / Yu.F. Martynov - Moscow: Medicine, 1979. - 216 p.

5. Methodical instructions on selection and semen breeding of nymphs of medicinal drugs; Sost. GS Levandovsky - M .: VILR, 1984. - 21 p.

6. Tip O.A. Methods of forming and maintaining collections of medicinal plants / O.A. Advice. - Poltava: PP PDAA, 2007. - 50 p.

7. Sampiev AM Medicinal Kalendula / AM Sampiyev, M.R. I want to - Krasnodar: Soviet Kuban, 2010. - 144 p.

8. Terekhin AA Technology of cultivation of medicinal plants: study. Allowance / AA Terekhin, B.V. Vandyshev. - M .: РУДН, 2008. - 201 c.

9. Frizshe N., Les plantes medisinales et condimen- taires au jardin / H. Frizshe // Stuttgart. - Ulmer, 1990. - P. 91-92.

10. Haban M. Agricultural aspects of medicinal plants cultivation / M. Haban, P. Ostepka, I. Salamon. - Nitra: Slovenska, 2008. - P. 9-10.

Released on January 12, 2015.