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ABSTRACTS

PLANT GENETICS AND BREEDING

*DORUCHOWSKI R. W. Efekt heterozji, zmienność, dziedziczenie i odziedziczalność oraz współzależność niektórych cech użytkowych u cebuli (*Allium cepa* L.). — Heterosis effects, variability, inheritance, heritability and correlation of some onion (*Allium cepa* L.) characters. (In Polish with English and German summaries). Instytut Warzywnictwa. Skierniewice. 1 - 79, 1983.

The heterosis effect of onion bulb weight and diameter, bulb firmness, skin adherence and sugar content was high. Statistical analysis of some traits (according to The UPOV Draft Guidelines) like bulb and collar shape, position of the root disc, colour and adherence of dry skin could be very useful for practical onion breeding.

These results corresponded with the evaluation of onion characteristics based on standard methods (measurement of the traits) of variability studies. The variability, heritability and relationships between these characteristics was determined in these research. Heritability, estimates of the bulb weight, height and diameter, skin thickness, collar shape and bulb firmness were relatively high (30 - 70%). Investigation on the correlation of six bulb traits showed that bulb weight particularly determined bulb diameter. The bulb diameter increased together with the increasing of the bulb height, collar thickness and diameter of the root disc. The inheritance of undertones of dry skin colour from light straw to brown was controlled by two additive genes. The segregation ratio obtained was 15 : 1 and 11 : 5. The dry skin of a dark colour (dark yellow, bronze coloured, brown ochre, orange brown) was stronger than the skin with a straw yellow and yellow colour. Skin adherence with a dark colour was tight. This was proved by the use of statistical analysis of the correlation. It is suggested that cultivars or F_1 hybrids with an average diameter and bulb weight with dark skin colour, good bulb firmness, relatively high dry matter and sugar content should be developed to avoid rotting and sprouting of the bulbs during storage.

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KOLASIŃSKA I., Wstępna ocena przydatności linii restorerów w hodowli mieszańców pszenicy. — Preliminary Evaluation of the Usefulness of Restorer Lines for Wheat Hybrid Breeding. (In Polish with Russian and English summaries). Hodowla Roślin, Aklimatyzacja i Nasiennictwo 26: 405 - 414, 1982.

Restorer lines were selected from F_2 hybrids obtained by crossing male sterile lines restorers. The breeding value of restorer lines, their effectivness of fertility restoration in F_1 hybrids, and general combining ability were evaluated. Results of the experiments showed that 3.1, 6.2, 8.3, 16.1 lines are the best restorers among all evaluated F_4 lines. Selected F_4

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* Summarized by Dr B. Wojciechowska

lines are full restorers with high combining ability and average performance per se. These restorer lines will be used in further stages of the programme for wheat hybrid breeding. Some aspects of methodology for breeding useful restorers were discussed.

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MAŁUSZYŃSKI M. Wysoka efektywność mutageniczna MNUA w indukowaniu różnorodności form karłowych i półkarłowych jęczmienia jarego. — The high mutagenic effectiveness of MNUA in inducing a diversity of dwarf and semidwarf forms of spring barley. (In English with Polish summary). Acts Soc. Bot. Poloniae 51: 429 - 400, 1982.

By the modified method of mutagenic MNUA treatment consisting in a short incubation germination, a very high frequency of point mutations was obtained in many varieties and stocks of spring barley. In the obtained collection of dwarf and semidwarf mutants a rich variability of many traits not connected with the plants height was noted. Mutations concerned the productivity of the plants, their tillering, the length and width of leaves, the habitus, distribution of leaves on the stalk and the morphology of the ear. The diversity of forms described in the collection of dwarf and semidwarf mutants characterises MNUA as a mutagen inducing a very high frequency of mutations in inicial cells.

(Zakład Genetyki UŚ, Jagiellońska 28, 40-032 Katowice, Poland)

MIAZGA D., CHRZĄSTEK M., Analiza genetyczna niektórych cech ilościowych linii substytucyjnych Chinese Spring (Cappelle-Desprez — The Genetic Analysis of some Qualitative Characters of Substitution Lines Chinese Spring) Cappelle--Desprez. (In Polish with Russian and English summaries). Hodowla Roślin, Aklimatyzacja i Nasiennictwo 26: 377 - 383, 1982.

Some quantitative characters of substitution lines Chinese Spring/Cappelle-Desprez were geneticaly analyzed. The mean tiller number was significantly higher in lines: 7B, 1D, 2D, 4D, and 7D than in Chinese Spring. Analysed substitution lines were not different than Chinese Spring with respect to ear length, except line 6D. Substituted lines of Cappelle-Desprez caused a reduction of spikelets number, except lines 4D and 6D, while lines 2A, 4A, 6A and 3B showed significantly higher number of kernels per spike was observed than in Chinese Spring.

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MIAZGA D., LIPKO E., Częstotliwość monosomików w mieszańcach Cappelle--Desprez × Grana. – The Frequency of the Monosomics in Hybrids Cappelle--Desprez × Grana. (In Polish with Russian and English summaries). Hodowla Roślin, Aklimatyzacja i Nasiennictwo 26: 385-392, 1982.

The work concern the transmission of the monosomy in successive generation of hybrids Cappelle-Desprez × Grana and monosomic lines Cappelle-Desprez. The frequency plants with 41 chromosomes depends from lines. Average frequency of monosomic was 62.25 per cent. Most of monosomics was in lines 3D and 5D a least in monosomic 4A and 4B.

Similar frequency of plants with 41 chromosomes was found among monosomics belonging to the some homologous group. It is interesting, that frequencies of monosomics decreased along with the increasing number of backcrosses. The frequency of monosomics in selfpollinated monosomic lines Cappelle-Desprez was lower than in hybrids with Grana. Average frequency of monosomic was 59.29%.

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PIĄTKOWSKA B. Cytologiczne badania mikrosporogenezy u męskopłodnych i męskosterylnych odmian uprawnych ziemniaka — Cytological Studies on Microsporogenesis in Male Fertile and Male Sterile Potato Cultivars. (In Polish with Russian and English summaries). Biuletyn Instytutu Ziemniaka, 27: 51 - 64, 1982.

Microsporogenesis and development of tapetum were investigated in three potato cultivars: Cvetnik — male fertile, Kołobrzeski — partly male sterile and Saskia — fully male sterile. In male sterile cultivars there was ascertained: 1) elongation of tapetum duration, 2) changes of tapetum growth rhythm, caused by accelerated transition from mononuclear phase into binuclear one, 3) perturbation in callose lysis. Asynchrony between tapetum tissue development and the process of microsporogenesis, seems to be a typical disturbance of genetically determined male sterility.

(Zakład Cytologii Roślin i Genetyki, Instytut Biologii UMK, ul. Gagarina 9, 87-100 Toruń, Poland)

ROGOZIŃSKA J. H., GOŚKA M., Próby uzyskania haploidów w kulturach pylnikowych buraków cukrowych, pastewnych i gatunków dzikich. — Attempts to induce haploids in anther cultures of sugar, fodder and wild species of beet. (In English with Polish summary). Acta Societatis Botanicorum Poloniae 51: 91 - 105, 1982.

In the investigation, aimed at obtaining beet haploids from anthers, the effect of mineral media, potato and sugar beet extract and p-fluorophenylalanine (PFP) in combination with growth substances was tested. Nutrient-starved plants as anther-donors, anther-starvation, cold treatment and photoperiod were also analysed. On all media the anthers produced callus and roots. The anthers of wild species showed lower ability to differentiate than those of sugar or fodder beets. Cytological analyses showed formation of multicellular structures until ca. the 12-th day of anther culture; afterwards, they degenerated.

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STASZEWSKI Z., TOMASZEWSKI Z., Żeńska jałowość u lucerny — *Medicago Varia Mart.* (*M. media* Pers.). — Female Sterility in Lucerne (*Medicago Varia Mart.*). (In Polish with Russian and English summaries). Hodowla Roślin, Aklimatyzacja i Nasiennictwo 26: 393 - 403, 1982.

The phenomenon of female sterility in lucerne spontaneous mutants is described. Female sterile forms, denoted as fs 1 and fs 2 were obtained from crosses between inbred lines. Analyses of crosses in which female sterile mutants were used as male and female parents as well as male

sterile and normal components proved that fs 1 and fs 2 plants are true female sterile. However no differences were found in flower anatomy between female sterile and normal plants, fs 2 plant did not produce seeds while in fs 1, forms reproductive functions were severely limited. Female sterility was phenotypicaly strongly expressed in offspring of different combination of crosses and segregation was observed in first progeny, which suggests genetical determination of this character. Female sterility in lucerne is determined probably by one recesive gene interacting with a cytoplasmic factor.

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SZWEYKOWSKI J., URBANIAK L. Interesujący polimorfizm chemiczny u sosny. — An interesting chemical polymorphism in *Pinus sylvestris* L. (In English with Polish summary). Acta Soc. Bot. Poloniae 51: 441 - 452, 1982.

Intra- and interpopulational polymorphism in the production of phenolic compounds is described in Polish populations of *Pinus sylvestris* L. Two mutually exclusive forms of pine trees are present in changing proportions in all populations studied. This allows three groups of populations to be distinguished. The character of this differentiation is discussed.

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ZIELIŃSKI R., Elektroforetyczne i cytologiczne badania mieszańców między *Aconitum napellus* i *A. variegatum*. II. Cytologia. — An electrophoretic and cytological study of hybridisation between *Aconitum napellus* ssp. *skerisorae* ($2n=32$) and *A. variegatum* ($2n=16$). II. Cytological evidence. Acta Soc. Bot. Poloniae 51: 465 - 471, 1982.

The number of chromosomes was determined in mitosis, the course of meiosis was analysed and the degree of pollen viability determined in plants with intermediate enzymatic phenotypes between *Aconitum napellus* and *A. variegatum*. One allotriploid plant was found with $2n=24$ and a group of plants with $2n=32$ showing disturbances in mitosis and meiosis. In mitosis somatic reduction and polysomaty were observed and in meiosis monads, diads, triads and polyads were present. These plants are considered as introgressive hybrids arising owing to a small scale gene flow from *A. variegatum* to *A. napellus*.

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ZIELIŃSKI R. Elektroforetyczne i cytologiczne badania mieszańców między *Aconitum napellus* i *A. variegatum*. I. Elektroforeza. — An electrophoretic and cytological study of hybridisation between *Aconitum napellus* ssp. *skerisorae* ($2n=32$) and *A. variegatum* ($2n=16$). I. Electrophoretic evidence. (In English with Polish summary). Acta Soc. Bot. Poloniae 51: 453 - 464, 1983.

The variability of six enzymes in pure and mixed populations of *Aconitum napellus* and *A. variegatum*, both from the Tatra Mountains was analysed by means of electrophoresis on starch and polyacrylamide gels. The enzymes differentiating the studied species are: glutamate dehydrogenase, isocitrate dehydrogenase, esterases and peroxidases. A group of plants was isolated with phenotypes intermediate between *A. napellus* and *A. variegatum*. Among them were most probably both F_1 and introgressive hybrids.

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