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FIELD CROPS SEEDS *mini*CATALOGUE

DR. HANA JAKEŠOVÁ
Clover and Grass Breeding
CZECH REPUBLIC



- Registered varieties
- Legume grasses
- Clovers
- Clover-grass mixtures

Dear trading partners,

We would like to thank you for your interest in our offer of certified seeds of legumes produced in the Czech Republic.

Following are presentations of our forage crops varieties that can be further combined to provide tailored mixtures.

We believe that you will find our cooperation beneficial and that you will be not disappointed with any of our varieties or mixtures you will purchase and use.

We would also like to address potential partners from other EU Member States who are interested in importing and reselling seeds of our varieties produced in the Czech Republic. There we would like to underline that as to seed production we have been in the startup phase and enough multiplied we only have cv. PRAMEDI, cv. PASTORELA and to some extent cv. VENCA.

For this reason, we would like to address also potential partners who are interested in multiplication and selling of seeds of our varieties abroad.

Based on license agreement, our partners in the EU can be even granted the right to give sublicenses. It is also possible to obtain exclusive license from our firm for a given territory. License agreement can also cover export or production and marketing of our varieties outside the EU.

As to new festulolium cv. NEREZ there has been global exclusivity granted to the Czech firm Agropop HB, the contact is provided bellow.

RŮŽA

ZIGZAG CLOVER

Trifolium medium L.

ORIGIN: The basis for the variety were octoploid genotypes obtained from the Prosser Gene Bank, USA, however the most important component was cv. „MELOT“ gained at the Research Institute for Fodder Crops in Troubsko, Czech Republic. In the selection process plants were selected with fast initial growth. Other selection criteria were health and seed gain.

DESCRIPTION: „RŮŽA“ is an octoploid clover variety with prostrate growth habit and with medium early spring growth, another feature is medium intensity of white marks on leaves; leaves characteristic is medium robustness and length, central leaflet is narrow; stem thickness is narrow to medium, stem length is short to medium; bloom is pink, head is spherical with lower number of blossoms but plants typically possess a large number of heads;

DISTINCTIONS: Zigzag clover is persistent and is resistant to hoof pressure due to rhizomatous root system; positive factors are high seed gain and attractiveness for pollinators;

USE:

- a good component for meadows and pastures
- high content of isoflavones (formononetin, biochanin) makes the variety a potential source for production of pharmaceutical compounds
- suitable for grazing when young

AGROTECHNICS:

Seeding: Similar to red clover - 20 kg/ha; before sowing it is important to carry out seeds scarification;

Fertilizers: 3q NPK before sowing;



RŮŽA is a variety produced by the company “Dr. Hana Jakešová Clover and Grass Breeding” with seat in Hladké Životice, Czech Republic, EU.

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PRESTO

TETRAPLOID RED CLOVER – 4n

Trifolium pratense L.

ORIGIN: The breeder's material that was used as a basis for the production of the new variety was contractually obtained from The Plant Breeding Station Hladké Životice, The Czech Republic, that is now part of The DLF Trifolium multinational company with its seat in Denmark.

DESCRIPTION: „PRESTO“ is a tetraploid red clover variety that is important due to a better resistance to powdery mildew and due to a higher resistance to the complex of clover leaf spots and to *Fusarium* spp.; variety also is resistant to lodging; stem typically is medium long and with medium thickness; leaves are described as medium long to long with intermediate width;

DISTINCTIONS: the most important distinction is resistance to powdery mildew; variety is characteristic by medium early spring growth and by fast regrowth after a cut;

USE:

- the persistency of the variety is comparable to other tetraploid red clover varieties (2-3 years in monocultures/pure stands and 3-5 years in clover grass mixtures)
- another positive factor are savings as concerns use of artificial fertilizers – „PRESTO“ just like other clover varieties is capable of fixing, in symbiosis with *Rhizobium* bacteria, of aerial Nitrogen
- there is no need to apply Nitrogen fertilizers to either clovers or to plants used as next in crop rotation

AGROTECHNICS:

Seeding: Same as other red clover varieties – from 10 to 15 kg/ha for seed production in pure stand; slightly more for green matter production;

Rhizobin: There is no need to apply specific *Rhizobium* bacteria/Rhizobin before sowing as these bacteria are already present in majority of agriculturally used fields;

Fertilizers: 3q NPK before sowing;



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PASTORELA

MEADOW FESCUE

Festuca pratensis Huds.

ORIGIN: the basis for „PASTORELA“ was variety „KOLUMBUS“ that is very late. „KOLUMBUS“ is registered in Germany. During the process of breeding „KOLUMBUS“ was crossed with several genotypes from among the world assortment (varieties ROŽNOVSKÁ, OTAVA, BARMONDO, BARTRAN, BARTURA, CAPELLA, DOTNUVA, LAURA, LEOPARD, POSEIDON, PREFEST, SKAWA, PREVAL and COSSMOS). Variety „PASTORELA“ is registered in the Czech Republic.

DESCRIPTION: „PASTORELA“ is not as late as „KOLUMBUS“ but is later than majority of world assortment meadow fescue varieties; due to the fact the variety can be used as five cut crop and yields per each of the five cuts are comparable; variety shows good resistance to rust and leaf spot disease; when compared to „KOLUMBUS“ distinct feature of our variety is higher length of stems; as to the quality, the new variety possess lower content of fiber whilst crude protein content and metabolized energy are higher;

DISTINCTIONS OF THE VARIETY: Important characteristic of the variety is good digestibility resulting from higher content of proteins; another characteristic is density which translates into better green matter and dry matter yield; variety also shows very good seed gain; important feature is good disease resistance;

USE:

- can be used for a long time in pastures and meadows
- can be used for shorter terms as a component in clover grass mixtures on arable land

AGROTECHNICS:

Seeding: for pure stands intended for seed production (multiplication) the amount is 15

kg/ha; as to the green matter production the amount can be 25 kg/ha;

Fertilizers: in the year of sowing 3q NPK before sowing and in the spring 2q of LAV or LAD; for seed production purposes in years following year of sowing 3q NPK in autumn and 2q of LAD or LAV in spring; for green matter production purposes 50kg/N after each cut;



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PRAMEDI

INTERSPECIFIC CLOVER HYBRID

Trifolium pratense L. x *Trifolium medium* L.

ORIGIN: The original hybrid material was gained in 1991 at the Research Institute for Fodder Crops in Troubsko, in the then Czechoslovakia via artificial hybridization done between tetraploid red clover variety "TATRA" used as maternal component and octoploid zigzag clover clone 10/8 used as paternal component. 12 hybrids were gained via in vitro cultivation that were subject to one generation of intercross. Material was then sent to the Plant Breeding Station Hladké Životice (now DLF Czech Republic). Basis for the variety provided plants having 29 chromosomes. Chromosome numbers were determined with the help of flow cytometry machine (Partec Sysmex). Material was backcrossed for five generations with tetraploid red clover cv. "AMOS".

DESCRIPTION: A characteristic of „PRAMEDI“ is a distinct root system. Some plants possess rhizomes that are however shorter compared to *Trifolium medium* L. plants but many individuals have a distinct root branching that cannot be observed in any of the parental species. Root crown is more lodged and there are statistically more stems per plant which means better green matter and dry matter gain. „PRAMEDI“ also shows late onset of senescence.

DISTINCTIONS OF THE VARIETY: Variety has seed gain comparable to tetraploid red clover varieties; other important features are good persistency and resistance to powdery mildew; variety can withstand drought; variety produces high quality green matter with less fiber and with higher content of crude proteins;

USE:

- can be used for direct grazing – well suited for meadows and pastures

- can be used as green feed as a component of clover grass mixtures that can be typically used for 3-5 years
- in pure stand or as a component of clover grass mixtures can be used for production of silage
- can be used as a green manure
- as other clover species „PRAMEDI“ can improve soil quality thanks to aerial Nitrogen intake via symbiosis with *Rhizobium* bacteria – there is no need to use artificial fertilizers



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VENCA

COLONIAL BENTGRASS

Agrostis capillaris L..

ORIGIN: The major component for the gain of cv. „VENCA“ was cv. „GOLF“; furthermore multiple selection was used and breeder's material was crossed with several Dutch varieties. Selection criteria were resistance to leaf diseases, and selected were plants with dark green color and with fine leaves.

DESCRIPTION: A characteristic of „VENCA“ is lower growth habit; another factor is a quick establishment and variety can well withstand low mowing (0.8 mm) and is therefore less demanding as concerns lawn care.

DISTINCTIONS OF THE VARIETY: Characteristic is very fine texture that makes „VENCA“ suitable for fine leaves and ornamental lawns; typical is a dark green color of the plants which makes the variety comparable to US varieties; variety is resistant to rust and to *Monographella nivalis* and can well withstand high temperatures, drought and water stress; variety regenerates well after stress conditions pass over;

USE:

- suitable to all kinds of lawns
- especially suitable for ornamental lawns
- can be used in golf resorts (less mowing, less watering and less verticutting)
- can be used as monoculture

AGROTECHNICS:

Seeding: 6-8 kg/ha for seed production; up to 300 kg/ha for lawn establishment;

Fertilizers: 300 kg NPK/ha before sowing; after seed harvest 50 kg/N (2q LAD or LAV);



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KOZÁK

CAUCASIAN CLOVER

Trifolium ambiguum M. Bieb., TFM

ORIGIN: The basis for the variety was the US variety „COSSACK“ obtained from The University of Madison, Wisconsin, USA; the genotype was crossed with hexaploid genotypes provided by the Prosser Gene Bank, USA; the selection process was based on criteria of early spring growth, health and seed gain.

DESCRIPTION: „KOZÁK“ is hexaploid, medium high clover characteristic by medium to strong intensity of white marks on leaves; leaves are robust with medium to high length of the central leaflet; growth habitus is described as intermediate to semi-prostrate with medium stem length and thickness; bloom is pink-white and plants typically have high number of heads that are long with conic shape and with high number of blossoms;

DISTINCTIONS OF THE VARIETY: Caucasian clover is persistent and is resistant to hoof pressure due to its rhizomatous root growth habit; variety combines quick establishment and persistency (can persist 16 years in a stand); positive factor is quality that is better compared to *Trifolium repens*; further positive characteristics are high seed gain together with attractiveness for pollinators;

USE:

- can persist in stand for a long time
- suitable for grazing
- a good component for meadows and pastures
- can be used in clover mixtures and in clover grass mixtures

AGROTECHNICS:

Seeding: for seed production purposes the amount is similar to red clover - 25 kg/ha; it is important to carry out seeds scarification before sowing;

Rhizobin: unlike in the case of red clover, there is a need to apply specific Rhizobium bacteria

stem/Rhizobin before sowing; Rhizobin can be obtained from our firm;

Fertilizers: 3q NPK before sowing;



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NEREZ

FESTULOLIUM 6n

Festulolium Asch. & Graebn.

ORIGIN: Nerez was gained via crossing Czech festulolium varieties Hykor and Felina with the use of pedigree breeding. Nerez is registered in the Czech Republic.

DESCRIPTION: Nerez is a hexaploid (6n) variety of festucoid type with a very good persistency; Nerez as variety is 2-3 days earlier when compared to Hykor but is considered late variety; distinct feature is higher length of stems which is feature shared with Felina; variety shows better resistance to rust diseases – namely to *Puccinia coronata* Corda and *Puccinia graminis* and has better fresh matter and dry matter gain compared to both parental species Hykor and Felina; variety is not a Genetically Modified Organism.

DISTINCTIONS OF THE VARIETY: variety with best fresh matter and dry matter yield so far; late with enhanced persistency, statistically significant rust resistance, hoof pressure resistance and early spring growth.

USE

- in mixtures for long term pastures and meadows
- in mixtures with clovers for short term use
- Nerez is a three cut variety

AGROTECHNICS:

Seeding: 15 kg/ha for seed production purposes, and 25 kg/ha for green matter harvest; higher multiplication grades shall be sown without cover crop; sowing depth is 2- 5 cm and seedbeds shall be well prepared; after sowing rolling and harrowing shall be done; Fertilisers: prior seeding 2-3q/ha NPK; in the spring 50 kg/ha of Nitrogen and the same amount after each cut in pure stand; in mixtures with clovers no fertilizing after cuts; during autumn of each harvest year 3q NPK/ha is recommended;

Crop treatment: in stands intended for multiplication, harrowing shall be done in

spring; after seeds harvest straw shall be removed and stand must be cut.

Fresh matter and dry matter yield comparison with cv. Felina and cv. Hykor carried out by the Czech Central Institute for Supervising and Testing in Agriculture (UKZUZ) between 2016 - 2019:

	Year 1		Year 2		Year 3	
	Fresh	Dry	Fresh	Dry	Fresh	Dry
Felina	100.4	99	99.95	98.65	97.7	97.6
Hykor	99.6	101	100.1	101.35	102.3	102.5
Nerez	103.8	106.1	101.7	102.05	104.2	106



NEREZ is an achievement of Hana Jakešová Plant Breeding Company, Hladké Životice, Czech Republic, EU.

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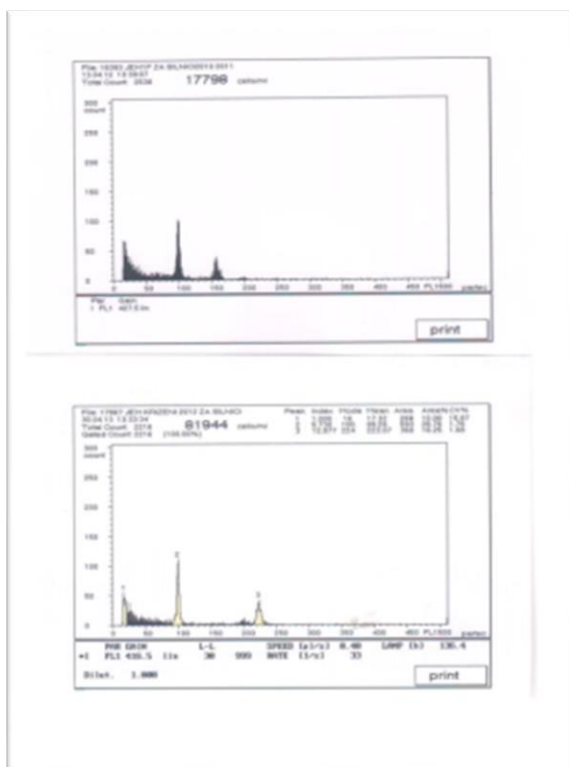
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FLOW CYTOMETRY



The research firm „Dr. Hana Jakešová Clover and Grass Breeding“ offers laboratory services and namely flow cytometry with the emphasis on determination of (hybrid) plants DNA content. At the disposal there is PARTEC PLOIDY ANALYSER flow cytometry machine (Sysmex Partec GmbH, Gorlitz, Germany).

The researcher Hana Jakešová has had more than 15-year-long experience with operating machines of this type. The price is CZK 150 per sample.

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