



Alternative plants of Institutes for Agricultural Research and Educational Farm University of Debrecen



Debrecen, 2017

Innovatív Tudomány

Innovation Science

Debreceni Egyetem Agrár Kutatóintézetek és Tangazdaság

University of Debrecen
Institutes for Agricultural Research and Educational Farm



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Research Institute
of Karcag



Research Institute
of Nyíregyháza

Debrecen, 2017

FOREWORD

The Institutes for Agricultural Research and Educational Farm (IAREF) of the University of Debrecen carry out agricultural research and development and innovation activities, which are required for the development of Hungarian agricultural and food industry products, regional, domestic and international research and development, maintenance of genetic background and provision of the professional foundation of regional and rural development. As regional knowledge centres, the three research institutes of IAREF are situated in three ecological districts: Hajdúság, Nagykovács and Nyírség, which provides perfect opportunities for the fulfilment of R+D+I task carried out under different ecological circumstances and which is especially favourable for the development of genetic foundations.

Breeding and variety preservation of alternative crops (ryegrass, sorghum, canary grass, proso millet, foxtail millet, oil radish, Hungarian and hairy vetch, buckwheat, grass pea, Sudan-grass) and production of their propagation material at the Research Institutes of Karcag and Nyíregyháza has a history of multiple decades. Stress tolerance of our varieties is excellent, due to their breeding under extreme agro-ecological circumstances. Bred varieties can be well integrated into crop rotation systems, they are suitable for dual cultivation, they have a role in the support of soil life and the protection of natural environment. Due to their excellent nutritional values, they have a major role in healthy human nutrition and animal feeding and certain varieties are suitable for industrial utilisation.

August 2017, Debrecen

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KARCAGI

Year of registration: 1967

Botanical characteristics:

- 50-60 cm stem height, long, remarkably dark green leaves.
- Develops many tiller leaves.
- Thin, medium tall stem.

Economic value:

- Vegetative type.
- Stools very well, tolerates grazing and cutting well.
- Excellent frost and drought tolerance, not sensitive to rust.
- Long vegetative life.
- Excellent quality aftermath.
- Well suitable for lawn and park mixtures.

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RYEGRASS

ZÖLDIKE

Year of registration: 1995

Botanical characteristics:

- Slightly prostrating, wide bushed perennial undergrowth.
- Well developed roots.
- Narrow leaves which are light green in the first year and then turn medium green.

Economic value:

- Stools well, composes a thick cover of lawn.
- A prominent component of turf and grass mixtures, germinates in 6-8 days and due to its fast development it forms an adjoining green surface, while slow developing species are able to gain strength.
- Tolerates drought and stomping.
- Excellent frost and stomp tolerance.
- Mixable at 50-60% ratio in turf mixtures.

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RYEGRASS

ALBITA

Year of registration: 2001

Botanical characteristics:

- Medium-late sorghum hybrid.
- Plant height: 120-150 cm.
- Medium compact panicles, white grain colour.
- Thousand kernel weight: 30-35 g.

Economic value:

- Currently the only white grain variety within the variety assortment.
- Low tannin content, excellent nutritive value.
- It is able to achieve outstanding yields (8-10 t/ha) on good quality soils and with proper nutriment supply.
- Harvesting takes place at the end of September; drying is necessary in almost every case.
- Suitable for pig and poultry forage and bird feed mixes.

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SORGHUM

BERÉNY

Year of registration: 1997

Botanical characteristics:

- Medium-late hybrid, excellent adaptability.
- Vegetative period is 130-140 days.
- Height: 180-220 cm.
- Refraction sugar content: 16-18 %.
- Ratio of panicle-stem-leaf: 25:53:22.
- Thousand kernel weight: 18-22 g.
- Optimal sowing time is end of April, beginning of May.
- Row spacing: 70-75 cm.
- Seed demand: 15-20/running meter.
- Can be sown with FAO 400 maize.
- Harvesting time: middle of September.

Economic value:

- Dry matter content remains in this interval for long, therefore it is well harmonised with the optimal harvesting time of the FAO 400 maize for silage.
- Securely producible on low quality soils.
- Rewards proper nutrition with high yields.

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SORGHUM

ZÁDOR



Year of registration: 1998

Botanical characteristics:

- Early maturity, excellent stability, high yield potential.
- 90-110 cm height, 10-15 cm long, medium compact panicle.
- Grains are light brown, tannin content is low.
- Thousand kernel weight: 25-28 g.
- Protein content: 12-13%.

Economic value:

- Substitutes maize in forage mixes at 40-60%.
- Potential yield 5-8 t/ha.

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SORGHUM

BOVITAL



Year of registration: 1984

Botanical characteristics:

- 160-210 cm tall thin, solid stem.
- Favourable stem-leaf ratio, rapid development, excellent initial development.
- Number of days between sowing and the emergence of panicles: 74-76.

Economic value:

- Successfully producible hybrid across Hungary.
- 2-3 harvests are possible under intensive circumstances, potential green yield: 80-120 t/ha, with 20-25 t/ha dry matter content.
- Continuous production is ensured during the droughty months of July-August even in unfavourable production areas.

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SORGHUM X SUDAN-GRASS HYBRID

GARDAVAN

Year of registration: 1992

Botanical characteristics:

- Excellent stability, 170-220 cm height.
- Good starting vigour and initial development.
- Number of days between sowing and the emergence of panicles: 72-74.

Economic value:

- Harvesting before the emergence of panicles results in high volume and quality green forage, which is suitable for ruminant animals.
- Primarily recommended for green feeding and silage production.
- In the case of multiple harvesting, its potential yield is 80-120 t/ha, with 20-25 t/ha dry matter.

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**KISVÁRDAI
41**

Year of registration: 1984

Botanical characteristics:

- Conventional canary grass variety with good yield potential and stability; suitable for bird food.
- Potential yield 2.0-2.5 t/ha.
- Thousand kernel weight: 6.5-6.7 g.

Economic value:

- Resistance to *Helminthosporium* and *Claviceps* is the same as that of the other canary grass varieties.
- Chemical composition is also similar to that of other canary grass cultivars, and it is close to oat characteristics.

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LIZARD

Year of registration: 1991

Botanical characteristics:

- 90-110 cm height, slightly waxy leaves.
- Thin, pyramidal, 3-4 cm long panicles. The end of the panicles becomes anthocyanin colour during blooming.
- Light brown grains, thousand kernel weight: 7.0-8.0 g.

**Economic value:**

- Securely producible on droughty regions and soils with low humus content.
- Grains are used as bird feed; a significant export commodity.
- Potential yield is 1.5-3.0 t/ha depending on the applied agro-technology and production site conditions.

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**BISERKA**

Year of registration: 1998

Botanical characteristics:

- Thick stemmed, 90-120 cm tall proso millet variety.
- Panicle is loose, and medium tilted.
- Yellowish white grains, compacted panicles, excellent yield potential, stable variety, slightly susceptible to rust and blight.
- Potential yield: 2.0-2.5 t/ha.
- Thousand kernel weight: 5.0-5.5 g.

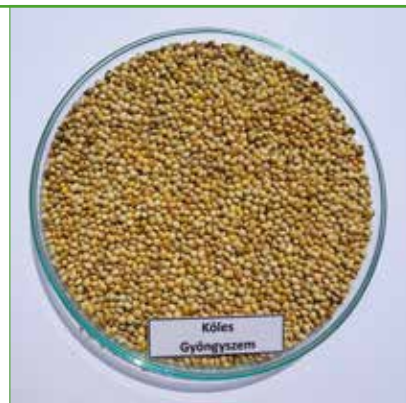
Economic value:

- Excellent nutritive value, grains are easy to husk.
- Its chemical composition is mostly identical to that of the rest of the yellow millet varieties.
- Easy to thresh, slightly inclined to over-maturity and shedding.
- Good drought and disease resistance.
- This variety has one of the lightest grains.



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GYÖNGYSZEM



Year of registration: 1991

Botanical characteristics:

- Thick stemmed, 90-120 cm tall proso millet variety.
- Panicle is loose, and medium tilted.
- Yellowish small white grains.



Economic value:

- Easy to thresh, slightly inclined to overmaturity and shedding
- Good drought and disease resistance.
- This variety has one of the lightest grains
- Thousand kernel weight: 5.0-5.5 g, potential yield: 2.0-2.5 t/ha.

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LOVÁSZ- PATONAI PIROS- MAGVÚ



Year of registration: 1941

Botanical characteristics:

- 70-100 cm tall variety, loose, flagged panicle.
- Red, shiny grains.
- Thousand kernel weight: 4.5-5.0 g.

Economic value:

- Excellent drought tolerance, successfully producible in droughty regions.
- Mainly utilised as bird seed, but also for human consumption
- Its straw is a valuable by-product.
- Suitable as after-seed or as a replacement of perished crops.
- Potential yield: 3.0 t/ha.



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MAXI

Year of registration: 1991

Botanical characteristics:

- Grains are white, with a shade of light-yellow; easy to husk.
- Height: 80-110 cm.
- Medium compacted panicles.
- Thousand kernel weight: 7-7.5 g.
- Vegetation period: 118-123 days.
- Seed demand: 60-70 plants / running meter.
- Cereal row spacing, 2-3 cm sowing depth.

**Economic value:**

- Requires warm weather, tolerates drought.
- Grains are suitable for human consumption, gluten-free, also utilised as bird-seed.
- Higher plant density results in declining yield.
- Excellent ability to suppress weeds.
- Its vegetation period is similar to that of the barnyard grass, therefore it is not to be sown to areas contaminated with barnyard grass.
- Slightly susceptible to shedding, but over-maturity should be avoided due to bird damage.

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**RUMENKA**

Year of registration: 1998

Botanical characteristics:

- Long, cylindrical shape, medium tilted panicles.
- Leaves and flowers are slightly anthocyanic.
- Reddish yellow grains.

Economic value:

- Thousand kernel weight: 6.0-7.0 g.
- Resistant to rust and blight diseases.
- Excellent drought tolerance.
- Easy to thresh and husk.
- Excellent yield potential: 3.2-3.8 t/ha.

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FRIDERIKA



Year of registration: 1996

Botanical characteristics:

- Plant height: 100-110 cm.
- Strong stalk, 20-25 cm panicles.
- Vegetation period: 140-150 days.
- Sowing period: end of April, beginning of May.
- Seed demand: green forage (cereal row spacing): 40-60 plants/running meter; seed production (45 cm row spacing): 80-100 plants/running meter.

Economic value:

- Primarily suitable for green foraging, hay and silage production. Remains green until the end of the vegetation period, its feeding is recommended as of the beginning of the emergence of panicles.
- Well utilisable in summer feeding, it provides high protein content forage in August and September.
- Ratio of leaves within total yield is around 55%.
- Required well prepared, garden-like cultivated, compacted soil for proper sprouting.
- Higher plant density intensifies the effect of drought.

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FOXTAIL MILLET



MEZŐHEGYESI SÁRGAMAGVÚ



Year of registration: 1963

Botanical characteristics:

- Rapid initial development, strong structure, abundant foliage.
- Yellow grains.
- Good stability, 15-20 cm compacted, cylindrical panicles.
- Thousand kernel weight: 3 g, good drought tolerance, sowing period at the beginning of May.
- Seed demand: green forage (cereal row spacing): 40-60 plants/running meter; seed production (45 cm row spacing): 80-100 plants/running meter.

Economic value:

- Utilisable as green feed or dried hay.
- Harvesting at the beginning of panicle emergence results in the best quality forage; also suitable as green forage production.
- Grains are used as bird seed.
- Rapid sprouting requires garden-like cultivated, smooth, compacted soil surface.
- Higher plant density intensifies the effect of drought.
- Absorbs a high amount of water and nutritive from the soil, therefore foxtail millet and any following crops require a proper amount of nutritive (mainly nitrogen).

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FOXTAIL MILLET

PIROSKA



Year of registration: 1999

Botanical characteristics:

- Foxtail millet variety belonging to the Moharia group, with high stalk and good stooling ability.
- Thick, strong stalk.
- Long, wide leaves.
- Curved panicles.
- Smooth, red, round grains.



Economic value:

- Favourable leaf ratio within total yield.
- Thousand kernel weight 2-2.5 g, grain yield: 2-2.5 t/ha.
- Green yield: 45-55 t/ha; from which 11-12 t/ha hay with excellent nutritive value is producible.

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SAROLTA



Year of registration: 1999

Botanical characteristics:

- Early foxtail millet variety belonging to the Moharia group, with rapid initial development and strong growth.
- 90-110 cm high stem, good stooling.
- Abundant foliage.
- Yellow grains, thousand kernel weight: 2-3 g.

Economic value:

- Utilisable as green feed or dried hay, grains are used as bird seed.
- Under favourable circumstances its green yield is 40-50 t/ha, hay yield is 8-11 t/ha, grain yield is 2-2.8 t/ha.



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LITINIA



Year of registration: 1980

Botanical characteristics:

- Vegetative period: 90-100 days.
- Flower colour varies between blue and white.
- Grains are light brown, but sometimes they might be red.
- Slightly pressed oval shape.
- Oil content of grains: 35-40%.
- Thousand kernel weight: 8-11 g.

Economic value:

- Well adapting oil radish variety with high yield potential, high oil content.
- It is able to bear -5, -7 °C in late autumn.
- Potential yield: 2-3 t/ha.

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BÉTA



Year of registration: 1967

Botanical characteristics:

- Hungarian vetch is an annual crop originally native in the Carpathian basin.
- White flowers, dark-grey grains with black spots, lightly pressed and hairy stems.
- Stalk height: 80-120 cm, thousand kernel weight: 40 g.
- Sowing period: middle of September, middle of October.
- It must be sown together with rye (60-80 kg/ha) or wheat (60-80 kg/ha).

Economic value:

- Alternative protein crop, used mainly for foraging. Tasty, valuable crop with good dietary effects.
- Suitable as green forage or hay, its protein and starch content is higher than that of the hairy vetch.
- Harvestable for green forage at the beginning, middle of May.
- Green forage mixes: Legány mix (Hungarian vetch + winter cereal + crimson clover), Landsberg-mix (Hungarian vetch + cereal + Italian ryegrass).

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HAJNALKA



Year of registration: 1991

Botanical characteristics:

- Plant height: 80-90 cm, ribbed, hollow stalk.
- Heart-shaped leaves.
- It has corymb flowers.
- Produce is 5-7 mm long, rounded pyramidal shape, three-edged acorn, its colour is dark-brown.
- Thousand kernel weight: 22-28 g.
- Vegetation period: 85-95 days.



Economic value:

- Medium stability plant.
- Good drought tolerance, securely producible on soils with low humus content, short vegetation period.
- Suitable for domestic and international requirements.
- Well producible as after-seed.
- Potential yield: 2.6-2.9 t/ha.

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LUTEO



Year of registration: 2017

Botanical characteristics:

- Medium upright sprouts, which are favourable for seed production.
- Yellow flowers, blooms a week earlier than the Szabolcsi 1 variety.
- Proper resistance to powdery mildew.
- Its protein and green yield surpassed the results of the standard variety in NÉBIH trials.

Economic value:

- Alternative protein crop.
- Important leguminous component of grass mixes due to its high protein content.
- Valuable protein source in early spring due to its rapid initial development.
- Secure performance even in ecologically unfavourable areas.
- Dry-matter yield in small-plot trials: 11-16 t/ha/year, protein yield: 1.9-2.5 t/ha.

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SZABOLCSI 1

Year of registration: 1983

Botanical characteristics:

- 40-60 cm tall plant, slightly procumbent stalk.
- Flower colour varies between yellow and orange.
- Compared to other varieties, it has more rapid initial development and better starting vigour.
- Good seed producing ability.
- Good stalk stability, medium resistance to powdery mildew.
- Proper winter tolerance.

Economic value:

- Alternative protein crop.
- Important leguminous component of grass mixes due to its high protein content.
- Valuable protein source in early spring due to its rapid initial development.
- Secure performance even in ecologically unfavourable areas.
- Dry matter yield: 5-6 t/ha/year.

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**KARCAGI
FEHÉRVIRÁGÚ**

Year of registration: 1990

Botanical characteristics:

- Sown with cereal row spacing 5-6 cm deep with 1.0-1.2 million seeds/ha.
- Flat 80-120 cm long stalk. Stalk and leaves are wax covered, flowers are bone-coloured.
- Thousand kernel weight: 180-220 g.
- Potential yield (depending on soil type and production year): 1.0-1.5 t/ha.

Economic value:

- Foraging: used as green forage and for pellet production, also utilised as hay. The value of its straw depends on harvesting, its digestibility is better than the straw of other legumes.
- Human consumption: Its legume and grain are suitable for soup and vegetable dish. Less gassy dish than other legumes.
- Green manure: Well utilised in primary and secondary sowing, it provides 50-60 kg/ha N.
- Melliferous plant, its blooming follows acacia.

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KARCAGI KISMAGVÚ



Year of registration: 2000

Botanical characteristics:

- Medium-large leaves.
- Sown with cereal row spacing 5-6 cm deep with 1.0-1.2 million seeds/ha.
- Thousand kernel weight: 160-180 g, therefore it can be sown with less seeds.
- Due to its drought tolerance, it is producible in areas where the production of other legumes is not recommended.

Economic value:

- Foraging: used as green forage and for pellet production, also utilised as hay. The value of its straw depends on harvesting, its digestibility is better than the straw of other legumes.
- Green manure: Well utilised in primary and secondary sowing, it provides 50-60 kg/ha N, the extra organic matter improves soil structure. It is well preferred in vineyards as well.
- Melliferous plant, its blooming follows acacia.

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GRASS PEA

HUNGVILLOSA



Year of registration: 1951

Botanical characteristics:

- Long (150-180 cm), thin, medium hairy stalks.
- Long, hairy leaves.
- Racemes are medium sized, flowers are dark-violet.
- Ripe legumes are yellow-brown.
- Grains are round, grey-black. Thousand kernel weight: 30-35 g.

Economic value:

- Alternative protein crop, its climatic requirements vary between wide limits. Excellent adaptability.
- Good ability to stool, good drought and frost tolerance.
- Valuable property of the variety: it is harvestable at the beginning or middle of May, it provides a large green volume on weak quality soils.
- Excellent green forage with rye, triticale and wheat.
- Its green yield varies depending on the accompanying crops, soil and precipitation conditions.
- Its potential yield is identical to or surpasses that of the foreign varieties.
- Green yield: 25-60 t/ha. Grain yield 1-1.5 t/ha.

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HAIRY VETCH

KST 1011

Year of registration: 1991

Botanical characteristics:

- Good stability, develops many secondary stalks.
- Stalk height: 200-240 cm, thousand kernel weight: 11-14 g.
- Excellent drought tolerance and water management, sowing period starts in the middle of April.
- Seed demand: grazing (4-5 cm row spacing): 24-45 plants/running meter, hay production (cereal row spacing) 25-30 plants/running meter.

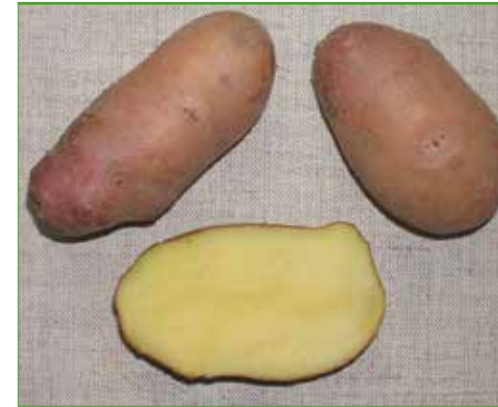
Economic value:

- Early variety, number of days between sowing and emergence of panicles: 65-70.
- Due to the fine structure of the stalk it is suitable for grazing and hay production.
- It is utilisable as of a 50 cm height, can be cut 3-4 times annually.
- Tolerates stomping, pressure.
- Utilisable as primary or secondary crop.
- Livestock upkeep of the production area increases by means on and off grazing.
- Dew-covered, wet plants should be grazed only after drying.

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SUDAN-GRASS

**BOGLÁRKA**

Year of registration: 2011

Botanical characteristics:

- Early maturity variety, vegetation period is 5-6 days longer than that of the Cleopatra variety.
- Tubers are long, oval, skin is pink, flesh is light yellow.

Economic value:

- Slightly floury consistency, delicious taste.
- Dual purpose potato variety: suitable for consumption and starch production.
- Resistant to potato leafroll virus (PLRV) and PVY virus.
- Resistant to leaf phytophthora, common scab and to tuber rots caused by fungi and bacteria.
- Not susceptible to crop failure.
- Potential yield: 35-45 t/ha.
- Starch content is higher than other early maturity varieties.
- Cooking class B, consumable both cooked and fried.

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OTHER CATEGORY - POTATO

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Variety preservation and breeding of potato, canary grass, proso millet, foxtail millet and oil radish.

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