

An overview of lesser-known and cultivated fruit bushes in Poland



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Less known and cultivated bush-berry crops

More interest in cultivation
– in few last years

- 1. Blue Honeysuckle**
Blue Sweetberry, HASKAP
– (*Lonicera sp.*)
- 2. Saskatoon berry**
– (*Amelanchier alnifolia*)
- 3. Sea buckthorn**
– (*Hippopae rhamoides*)

„on the horizon”

- 1. Actinidia („mini-kiwi”)** – (*Actinidia sp.*)
- 2. Elderberry** – (*Sambucus nigra*)
- 3. Cornelian tree** – (*Cornus mas*)
- 4. Blackberry** – (*Rubus fruticosus*)
- 5. Rosa hip** – (*Rosa sp.*)
- 6. Grapevine** – (*Vitis vinifera*)

Blue Honeysuckle **HASKAP** – (*Lonicera sp.*)

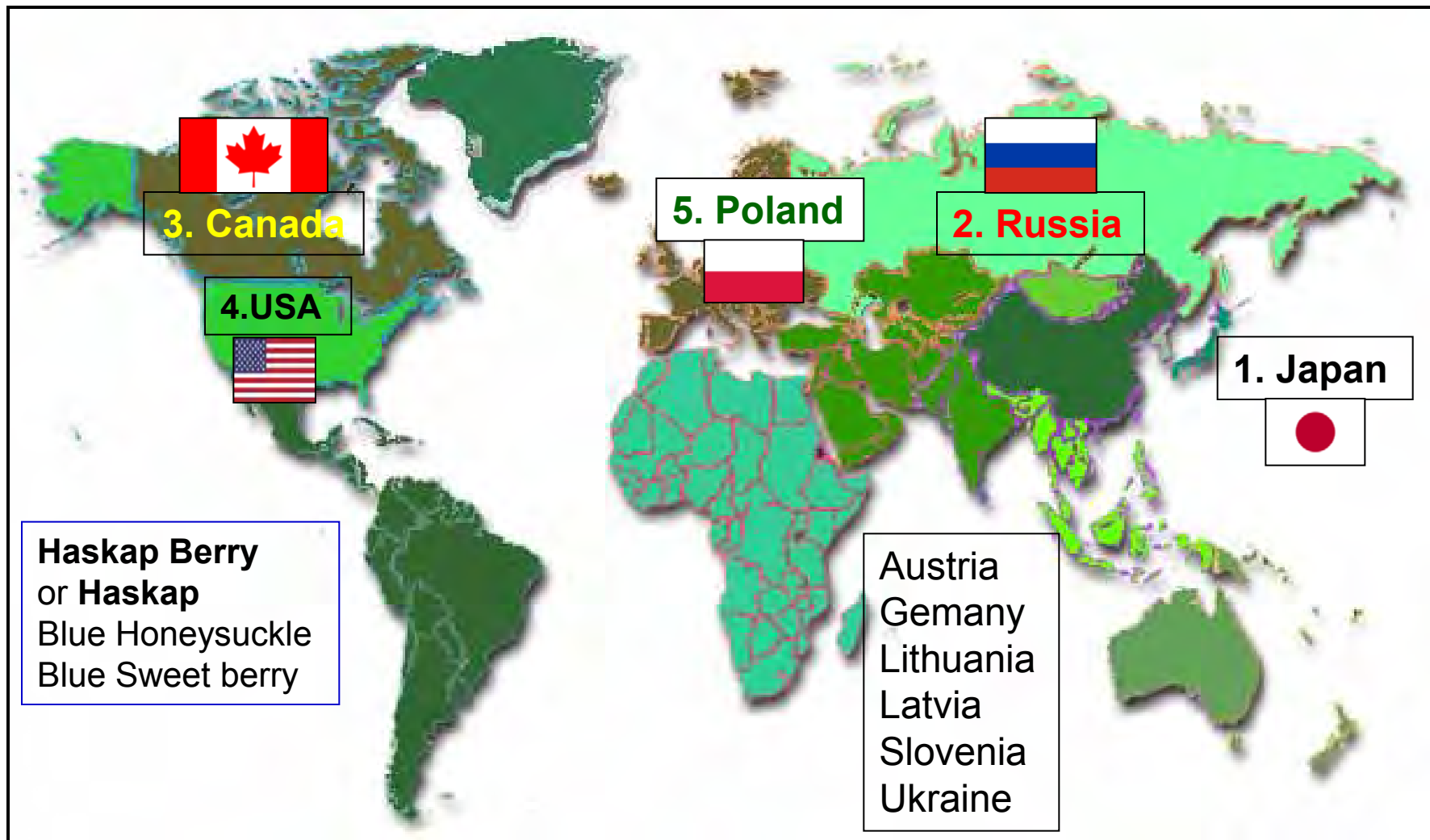
- hit in the cultivation of fruit bushes in Poland.



Suchodrzew jadalny (siny), wiciokrzew siny
lub „jagoda kamczacka”, **HASKAP**
Lonicera caerulea var. *kamtschatica* Sevast.



Countries cultivating HASKAP („Kamchatka berry”) in the world



Phenological phases in Central Poland (1)



20.03. – bud bursting



14.04. – flower's bud emerging



3.05. – full flowering/blooming



10.05. – fruit setting

Phenological phases in Central Poland (2)



17.05. – fruit developing



5.06. – fruit ripening



10-25.06. – fruit harvesting

General information:



- **HASKAP** (Kamchatka berry) is not a widespread species, and certainly noteworthy, for conventional, IP and organic cultivation.
- Plants have not too big soil and climatic requirements, they tolerate well winter temperature drops (-30°C) and flowers are tolerant to frost (-6°C).
- The fruits ripen very early in the season, because sometimes at the end of May and are one of the first dessert fruits on the market in the country.

Short characteristics (1)

- **Shrub** about 1.5-2.5 m high, long-lived.
- **The flowers** are mid-sized, funnel-shaped, yellowish-white, up to 2 cm long, appear in the mid-April to early May, flowering lasts 1-2 weeks. They are insect-pollinated (most often pollinated by bumblebees, rarely by bees).
- **A double-sex plant**, but not self-pollinating (out-pollinating) - requires cross-pollination for high yield and fruit quality (size)
- In practice, to ensure **cross-pollination**, 2-3 cultivars should be planted, which bloom at a similar time or planted with a special design: **cultivar - pollinator** (in the ratio of 3: 1).

FLOWERS



FRUITS



- **The fruit** is a fleshy, elongated drupe (commonly called “berry”), with a navy blue color, covered with a blue wax coating.
- **Fruits** vary in size and shape. Their diameter - about 1.0 cm and length up to 5.0 cm, and the average weight of 1 fruit is **1.0-1.5 g**, it can reach up to **3 g**.
- They are juicy, have a sweet-sour taste with bitterness (older varieties) or without bitterness (new varieties). They ripen very early - from end of May and beginning of June.

Size and shape of fruits



- A** – small fruits
- B** – pointed, elongated fruits
- C** – medium-large fruit (derivatives of Russian types)
- D** – large rounded fruits (hybrids from types from Kuril islands x Russian) - optimal
- E** – large, broad and heavy fruits (hybrids from the Russian islands of Kuril types)

The perfect shape of fruit



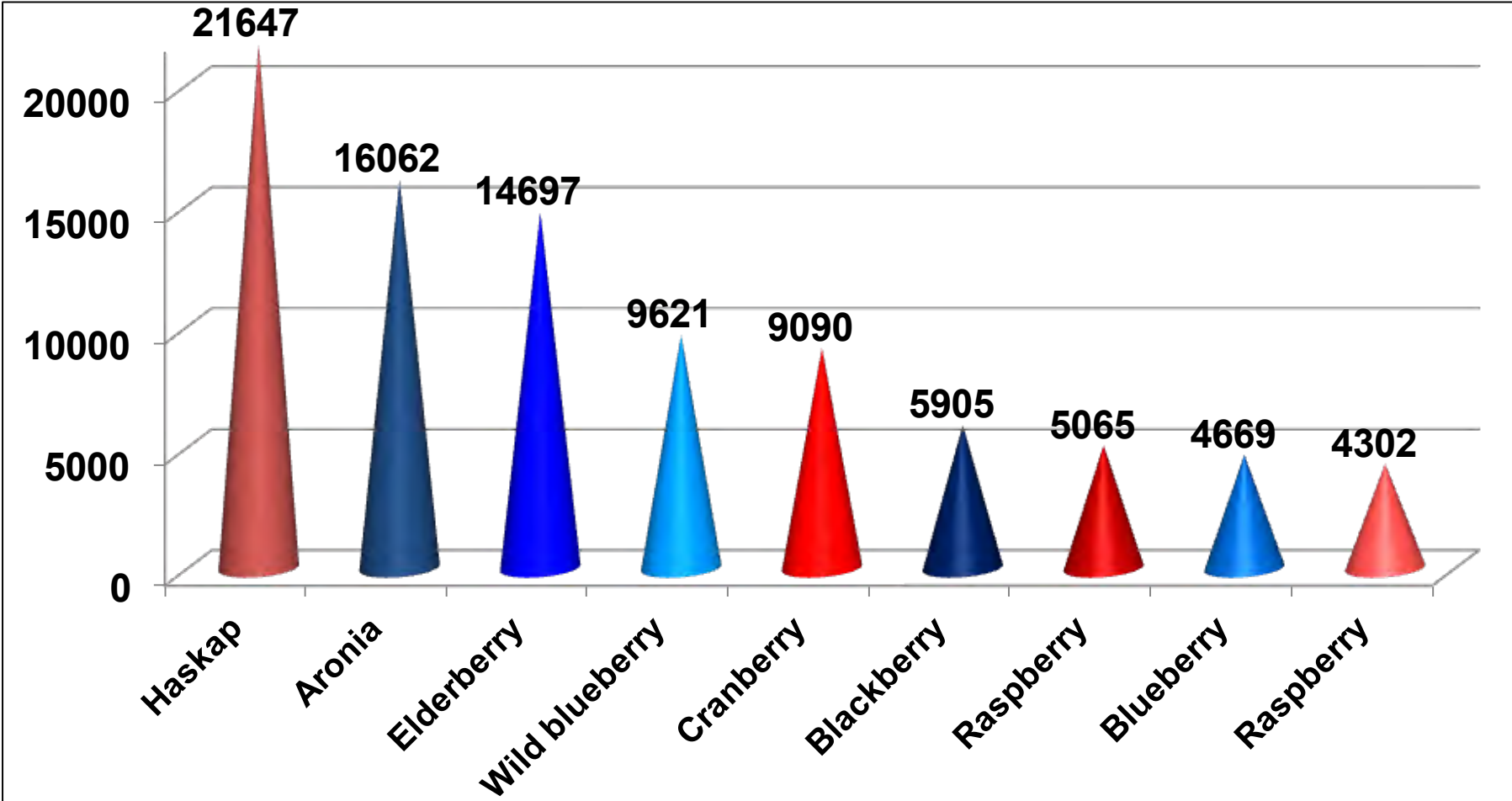
Short characteristics (2)

- Fruit - dessert, for processing and freezing. They contain many biologically active ingredients with strengthening, antiseptic and antioxidant properties. These are: carotene (provitamin A), thiamine (B1), riboflavin (B2), folic acid (B9), pyridoxine (B6), vit. C, routine (P) and pectin and tannins. They contain many natural macroelements beneficial for the body (magnesium, boron, sodium, potassium, calcium, phosphorus) and microelements (manganese, copper, bar, silicon, iodine).

They have high antioxidant properties, according to <http://haskapberries.com>, the level of antioxidants is the highest among the fruit tested.

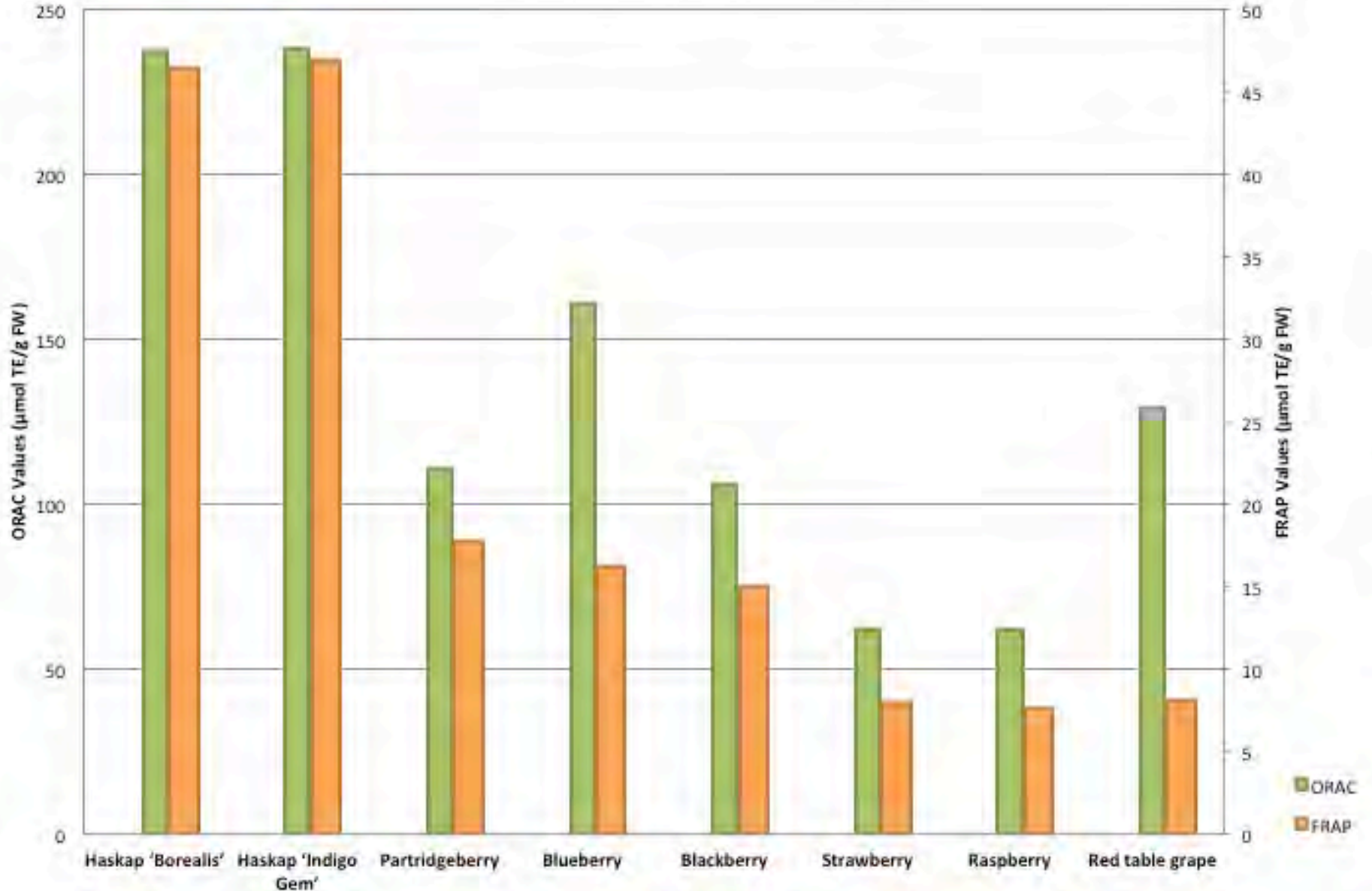
Antioxidant properties of selected fruits

ORAC units



Daily requirement - 5000 units

Antioxidant Comparison Chart



CULTIVATION REQUIREMENTS

- 1. Soil** - low requirements, medium fertile, optimal, slightly acidic (pH 6.0-6.5), location - even, light slopes, no frost, wet and dry,
- 2. Light** - a light-loving plant, tolerates light shading, but then the berries are smaller. Plentiful yields only on sunny and sheltered from the wind.
- 3. Temperature** - shrubs are completely resistant to winter frost, they tolerate temperature down to -30°C , flowers tolerate up to -6°C .
- 4. Water** - relatively high requirements, drip irrigation system is recommended. Negative impact of drought in the period of fruit formation and ripening on their quality, tendency to fruit fall, yield reduction,

Plantation establishment

- **Plant material** - is propagated vegetatively, planted in containers (usually in pots P9),
- **Planting term** - the best autumn, due to the very early vegetation of these plants, springtime requires longer acclimation, in containers can be planted into the ground throughout the growing season,
- **Planting spacing:**
 - amateur cultivation: 2.5-3.5 m x 1.0-1.5 m
 - commercial plantations: 4.2 x 0.70 m (3.4-3.5 thousand /ha)
 - picking of fruit by harvester
- **Cultivation systems:**
 - without mulching
 - mulches (agro-textile, organic substances)

Planting material



Cultivation systems in the field

Mulching with agrotextile



without mulching



Breeding centers of HASKAP (Kamchatka berries) in the world





Uniwersytet Saskatchewan, Kanada

New cultivars

Aurora



Borealis (9-94)



Tundra (9-84)





Canada

Indigo series cultivars

Indigo Gem (9-15)



Indigo Treat (9-91)



Indigo Yum (9-92)



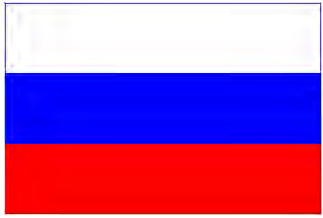


Canada

Honeybee



- Wybrana jako zapylacz dla 'Borealis', 'Tundra' i serii 'Indigo'.
- Kwitnie w tym samym czasie,
- Bardzo szybko rośnie
- Plonuje dobrze i szybko wchodzi w okres owocowania.



Russian cultivars

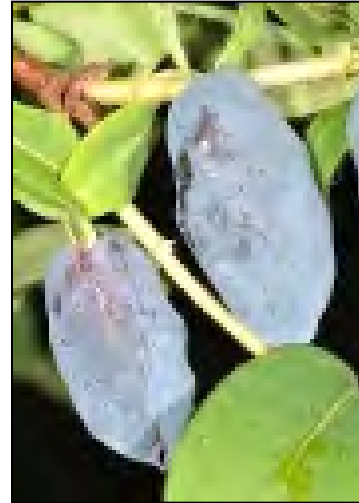
- FGUP „Bakczarskoje” Rosselhozakademii,
Tomski region,



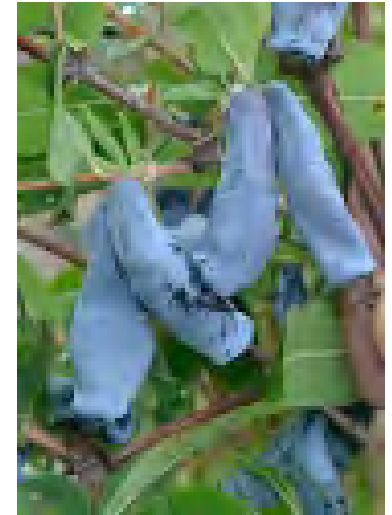
Bakczarskaja Jubilejnaja
- NEW



Bakczarskij Velikan



Czulimskaja

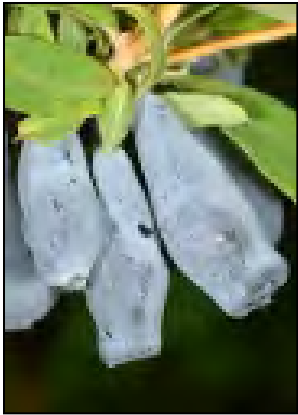


Docz' Velikana
- NEW

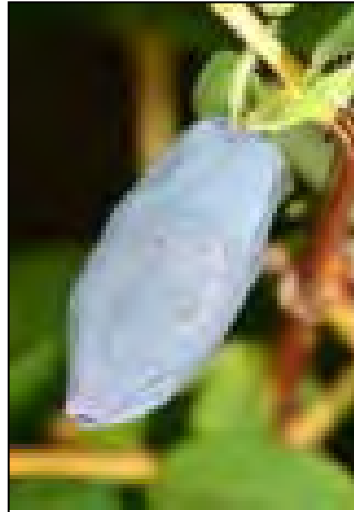


Odmiany rosyjskie

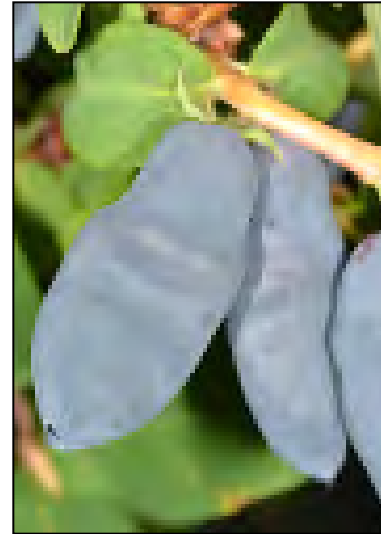
- FGUP „Bakczarskoje” Rosselhozakademii,
Tomski region,



Gordost' Bakczara
- NEW



Jugana
- NEW



Silginka
- NEW



Streżewczanka
- NEW



Vostorg
- NEW



Polish cultivars, private breeding

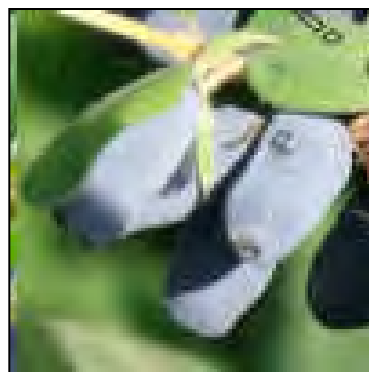
Zofia i Hieronima Łukaszewski



Zofia Łukaszewska

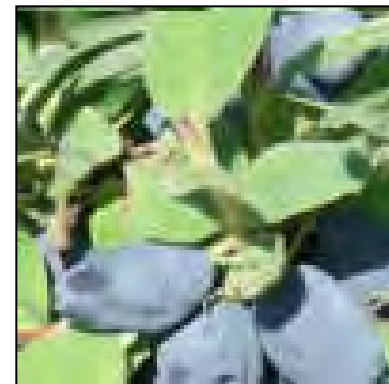


‘Wojtek’

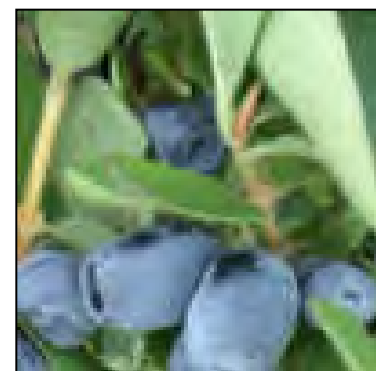


‘Jolanta’

1. Atut
2. Brązowa
3. Czarna
4. Duet
5. Iga
6. Jolanta
7. Rebeka
8. Ruben
9. Tola
10. Wojtek
11. Zielona
12. Zojka
13. Nr 44



‘Rebeka’



‘Zojka’

Care treatments:

1. Fertilization:

a/ organic preparation of the field before planting of plants in the autumn. Manure, humus, compost, peat should be applied or green plants for plowing.

b/ mineral

- special fertilization programs are recommended by different firms/companies – according to soil and leaf analyses

c/ foliar after flowering and after fruit harvest (2-3 times in the season)

Care treatments:

2. Pruning:

a / potted cuttings - young, planted plants are not pruned, because it delays fruiting, but single shoots - cut into 3-4 buds,

b/ Systematic pruning prześwietlające starts from 4-5 years after planting with the developing of of bushes

- **autumn** is the best time, after the leaves have fallen

- or **at spring** (at the latest till the end of March),

c / cięcie odmładzające - old bushes (20-25 years old) cut to a height of 30-40 cm from the ground level.

CIĘCIE PRZEŚWIETLAJĄCE



BEFORE

AFTER

CIĘCIE PRZEŚWIETLAJĄCE



CIĘCIE PRZEŚWIETLAJĄCE



Care treatments:

3. Weeding:

- mechanical
- manual (hand)
- **chemical herbicides (no registered herbicides)**

4. Protection against pests & diseases:

- some cultivars are susceptible to powdery mildew and / sun burn
- occasionally a pinkish rosebud (*Pandemis ribeana*), willow ... (*Chionaspis salicis*), green honeysuckle aphid may occur.
- **there are NO recommendations and registered pesticides in the current Plant Protection Program.**

FRUIT HARVESTING:

- hand
- harvesters



Canada – 2015





FRUIT HARVESTING:

Poland – 2016



More: <http://www.jagoda-kamczacka.com/zbior>

The use of fruit



- **as fresh** (dessert fruits)
- **processing** (compotes, juices and wines, jam, jams and preserves),
- **for cakes, ice cream, yoghurts,**
- **natural dye** for other juices and food,
- **dried fruits** contain all their valuable properties,
- **freezing**, after thawing, they break down into a smooth mass giving the mousse a perfect match for desserts and pastries.

The use of fruit



- **folk medicine** - a capillary strengthening agent for cardiovascular diseases as well as diseases of the stomach, liver, gall bladder. They favor the excretion of radioactive substances. The berry juice heals mycoses and ulcers, and the decoction of leaves and flowers - diseases of the eyes, throat and skin.
- **Tibetan medicine** - decoction of bark, as a remedy for headaches, rheumatism, arthritis, severe stomach pains. For wound healing, shredded leaves are used that have antiseptic properties. From dried young shoots, a decoction is used as a diuretic and as an anti-hair loss remedy.

SUMMARY:

- 1. HASKAP** is a plant that does not require long-lived in cultivation and is the early ripening (like strawberries). The new cultivars combine the most desirable features – yield , tasty fruit (no bitterness), high frost resistance, usefulness for harvesting and cultivation using different methods.
- 2. The fruits** contain large amounts of vitamins, natural minerals and bioactive compounds that have a positive effect on human health (dietetic, prophylactic and therapeutic properties).
- 3. Availability on the market of many cultivars** of different origins, the possibility of machine harvesting of fruit and ease of selling and an attractive prices of fruit contributes to increasing the area of commodity plantations in our country, Europe and the world.
- 4. Prices – 12-20 zł. PLN/kg (2,85 – 4,75 €/kg)** in 2014-2017,
- 5. Paradox - Haskap is an illegal cultivated crop and on fruit market in EU countries.**



THANK YOU