Polish raspberries conquering the world: can one variety thrive across diverse climates?

Dr Agnieszka Orzel

Dr Agnieszka Orzel is a leading expert in agricultural research and innovation, specialising in sustainable farming practices and crop management strategies. With a PhD in Plant Science and over a decade of experience in the field, Dr Orzel has worked extensively with growers, researchers, and industry stakeholders to develop cutting-edge solutions that improve productivity and environmental sustainability.

You can watch Agnieszka's talk by visiting bit.ly/BQI25-AO or by scanning this QR code

At BQI25 in Tasmania, Dr. Agnieszka Orzeł, owner of Dr. Berry and an experienced raspberry and blackberry breeder, posed a thought-provoking question to the audience: Is it possible to develop a single raspberry variety capable of thriving across vastly different climatic conditions worldwide?

This is a challenge that growers, breeders, and researchers have faced for decades. Raspberries – seemingly delicate fruits that favour temperate climates – can, in fact, cross both geographical and climatic boundaries. However, as Dr. Orzeł emphasised, the key to success lies in understanding plant biology, genetics, and local environmental conditions.

Dr Agnieszka with large black *Maryna* blackberries currently under trial in Australia

Poland: a berry powerhouse in Europe

Poland is rapidly becoming a hub of innovation in raspberry breeding. As one of the largest raspberry producers in Europe, the country cultivated 22,000 hectares of raspberries in 2024, yielding 110,000 tonnes of fruit. The leading region is Lublin Voivodeship, which accounts for 71% of the national raspberry supply, with over 15,000 hectares of plantations.

Where do these raspberries go? Approximately:

- **46%** are frozen
- **28%** processed into concentrates
- **8%** are exported
- The remainder supplies the fresh domestic market

This diversity in market channels drives the need for a range of production systems and raspberry varieties – from traditional floricane summer varieties to modern primocane types capable of producing two crops per season.

One of the greatest strengths of the Polish raspberry sector is its varietal diversity. Leading varieties include:

- *Delniwa* (27.1% market share)
- *Glen Ample* (22.3%)
- *Polka and Polonez* (12–13%)

Each of these cultivars was bred with specific climatic and production requirements in mind. But the question remains: Can a single, universal variety perform equally well in the cool climates of Poland and the hot sun of Australia or Central Asia?

Raspberry breeding in Poland: combining tradition with innovation

Raspberry breeding in Poland is not only a continuation of a rich tradition but also a dynamic response to global market demands and climate change. The country has operated intensive breeding programs for decades, beginning with the National Raspberry Breeding Program, initiated in 1979, and continuing today across public and private institutions.

Notable outcomes of these programs include world-renowned varieties such as:

- global bestseller *Polka*
- *Polonez*
- *Przehyba*

Each is tailored to specific climatic conditions and grower needs.

In parallel, private breeding initiatives have flourished, including the work of Dr. Agnieszka Orzeł, who since 2012 has led private projects (initially in collaboration with Niwa Berry Breeding and now independently at Dr. Berry). Over this time, she has completed over 4,300 Rubus crossings and submitted 15 new raspberry and blackberry varieties for official testing.

Her portfolio includes not only classic red raspberries but also unique coloured cultivars and primocane blackberries (such as *Maryna*, currently under trial in Australia):

- *Delniwa* – red, everbearing (primocane)
- *Husaria* – deep red, double-cropping, under trial in Australia
- *Promyk* – yellow, ideal for fresh markets and freeze-drying
- *Jantar* – golden
- *Heban and Megan* – black raspberries, with Megan being one of the first everbearing black raspberries in Europe

This palette of colours and nutritional profiles reflects rising consumer interest in superfoods and health-enhancing produce.

Delniwa: a raspberry for global markets

One of Dr. Orzeł's most promising achievements is the *Delniwa* variety. This red primocane raspberry adapts exceptionally well to diverse climatic zones:

- the cool conditions of Poland
- temperate Western Europe
- the extreme heat of Uzbekistan and Australia

In Uzbekistan, where summer temperatures reach 50°C, *Delniwa* not only survives but produces high-quality fruit. Trials conducted in Massachusetts (USA) and Brisbane (Australia) confirm the variety's adaptability. Currently, *Delniwa* is undergoing quarantine procedures in Australia prior to local trials.

Key features of *Delniwa* include:

- high disease resistance
- self-pollination capability
- consistent fruit quality under high temperatures
- adaptability to different production systems (open field, tunnels, mechanical harvesting)

***Delniwa* raspberries; a red primocane variety adapts exceptionally well to diverse climatic zones**

The role of flowering biology in climatic adaptability

Dr. Orzeł emphasised that successful raspberry cultivation across different climates relies not only on genetics but also on a deep understanding of flowering and pollination biology.

Her research highlights that:

- The optimal temperature for raspberry flowering and fertilisation is 20-25°C
- Temperatures above this range significantly reduce pollen viability
- Pollinators such as bees and bumblebees can increase fertilisation rates from 2% to up to 80%

In high-temperature conditions where pollinators are scarce, traditional varieties suffer from low yields. However, *Delniwa*, as a self-pollinating variety, does not depend on insect pollination, making it ideal for challenging environments with limited pollinator populations.

Moreover, *Delniwa*'s fertilisation process completes within four days of flowering, ensuring high fruit set efficiency, even in extreme heat.

Floricane vs. primocane: climate-specific breeding

During her lecture, Dr. Orzeł outlined the key differences between floricane and primocane varieties:

- Floricane – fruit on two-year-old canes, require winter chilling and are more sensitive to climatic variability
- Primocane – fruit on first-year canes, eliminating the need for winter chilling, making them ideal for warmer regions

This flexibility enables growers to adapt cultivar selection to local environmental conditions. At Dr. Berry, the focus is on primocane breeding, given their superior potential for climate resilience.

The new *Husaria* variety is a deep red, double-cropping berry currently under trial in Australia

Climate change adaptation in raspberry breeding

The ongoing climate crisis presents significant challenges for fruit growers globally, including:

- droughts
- heatwaves
- shifting water availability

To address these issues, Dr. Orzeł advocates for:

- breeding for resilience
- microclimate management (e.g., shading, drip irrigation)
- mechanisation of harvesting to combat rising labour costs

At Dr. Berry, breeding programs focus on cultivars with:

- high drought tolerance
- stable fruit quality under heat stress
- compatibility with mechanical harvesting

These traits are essential for ensuring sustainable production in a rapidly changing world.

Education and sustainability: Dr. Berry's holistic approach

Breeding climate-adaptable varieties is only one aspect of Dr. Berry's mission. The brand is also deeply committed to education and promoting healthy dietary habits. Initiatives like 'Super Girls Eat Raspberries' and 'Berry Education' aim to raise awareness of raspberries' nutritional benefits and their role in preventing lifestyle diseases.

The diverse colour spectrum of raspberries – red, yellow, golden, black – is not just visually appealing but also represents a range of bioactive compounds that support human health.

By combining innovation in breeding with educational outreach, Dr. Berry is helping to shape the future of sustainable berry production worldwide.

All photos credit: Dr Berry