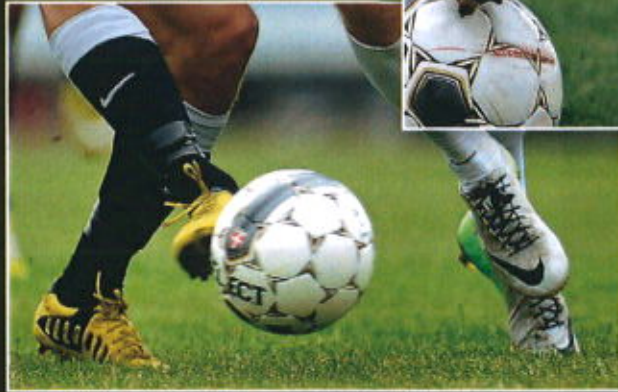


20 MOST INNOVATIVE VARIETIES IN 2020
europeseed
MAY 2021

SELECT THE WINNER

BREEDERS MAKING SURE WE DON'T RUN OUT OF GRASS



KICKING OFF

THE DEBATE ON NBTS IS STARTING IN EUROPE

GOAAAALLLLLLLLLL

HOW TO SCORE THE BEST KENTUCKY BLUEGRASS VARIETIES

PITCH PERFECT

UEFA SHARES ITS GUIDANCE FOR HIGH QUALITY GRASS FIELDS

KEEP THE BALL ROLLING

EU POTATO GROWERS DEALING WITH THE CIPC BAN

EUROPEAN-SEED.COM

COLUMBIA RIVER SEED TECH SHEETS



20

MOST INNOVATIVE PLANT VARIETIES OVER 2020

Dear readers of *European Seed*,

Let's face it, not many people can make reliable predictions about the future. But do you know who has to make such predictions due to their jobs? Plant breeders! They need to predict what consumers want, 15 years ahead of time.

Creating a new plant variety takes seven to 15 years, and in certain crops even longer than that. So, when they start to develop a new variety, the plant breeder has to make assumptions about what farmers need, and what consumers will want 15 to 20 years from now.

And if only they could look into a crystal ball and predict what the consumers' tastes and preferences will be by that time. Unfortunately the process is a whole lot more arduous than that. It requires generating more genetic diversity, a lot of crossing and selection, testing of the offspring, data processing, and yes, a bit of luck.

It is not only a higher yield or a better taste that the breeder is after. The new variety will need to boast a myriad of improved characteristics to make it stand out amongst all the others. Depending on the crop and the location, the new variety needs to have a higher resistance against pests and diseases, better drought tolerance, more proteins, higher levels of beneficial compounds such as vitamins or antioxidants, or just make it easier for the farmer to harvest the crops. And these are just a few of the breeding goals that plant breeders work on.

In addition, the assumed consumer preferences can vary quite a bit, due to changes in income, market supply of food products, information, and technology. And these changes all happen within a time scale that is far shorter than the creation time of a new variety. So, a constant adjustment of breeding objectives during the course of a breeding program is necessary.

Lucky for us, each year we are treated to many new plant varieties, in all kinds of crops. And the amount is just astounding! The annual number of new varieties arriving on our European plates over the past few years has been hovering around 3,500 new

plant varieties. That is almost 10 new plant varieties per day that are added to the toolbox of farmers to grow and on the plates for consumers to enjoy.

At *European Seed*, we wanted to shine some light on all these new plant varieties and give you a taste of the innovations that are out there. But of course, we can't show all 3,500 new varieties of 2020 here, so we asked the national seed associations in Europe, and many other peers in the European seed sector to send us their lists of which varieties in their eyes were the most innovative of last year.

You will find a few lines of text per innovative plant variety, explaining in a nutshell why this variety is so innovative, and what its contribution is to the farmers toolbox or the consumers plate. Take a good look at the list on the next few pages, and you'll notice the wide range of different challenges that these plant breeders have managed to overcome such as or drought or heat decreasing yield or viruses, fungi or nematodes attacking the crop. But you'll also read about the new innovations these varieties are bringing to EU agriculture e.g., higher levels of antioxidants, higher yield, or better digestibility for cows.

With 3,500 new varieties per year, we can only show you the tip of the iceberg, and many other new plant varieties should be recognized for their innovation. Needless to say, that there will always be plant varieties who you think should have been on the list, and perhaps question why others did actually make it on there. We very much welcome and look forward to any feedback you wish to share. You have standing invitation to share your feedback as to which varieties you think should have been on the list, and why.

And the next time you enjoy a healthy meal, not only thank the farmers, but also thank the plant breeders.

We hope you enjoy the list and look forward to your feedback.
Marcel Bruins



RESEARCH

Observation Plots



2020

20 MOST INNOVATIVE PLANT VARIETIES

VARIETY: ADORA
CROP: TOMATO
BREEDER: HM CLAUSE

Adora is a truly unique tomato variety with an abundance of sweetness and flavour (thanks to more than seven degrees of Brix (a measure for sugar content)). With an authentic Marmande shape and delightfully unique brown colour, ADORA is also naturally rich in antioxidants, such as lycopene, beta-carotene and tocopherol, that have a protective effect against major chronic diseases (cancer, cardiovascular disease, diabetes). This variety is also a source of vitamins and minerals, with consuming one ADORA tomato covering a quarter of the daily intake of vitamins A and C. Its high potassium content also helps to reduce high blood pressure. The growers in traditional Spanish production regions use their passion and know-how to deliver top-quality ADORA fruits. Only those tomatoes meeting specific production requirements are worthy of bearing the "ADORA" label. Customers can always trust the label and be delighted by the taste and colour of this truly inimitable tomato.



VARIETY: AF ZORA
CROP: WHEAT
BREEDER: AGROTEST FYTO LTD

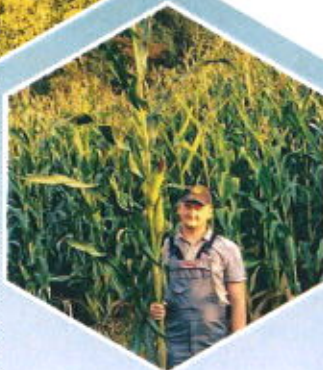
Winter wheat variety 'AF Zora' is characterized by a black colouration of the grain, which results from a combination of genes for purple pericarp (Pp genes) and blue aleurone (Ba2 gene). The black grain has an extremely high content of anthocyanins, almost twice as high compared to blue and purple grain varieties. It also has an increased content of phenolic acids and total antioxidant capacity. Wheat with a high anthocyanin content is attractive for food processing industries. High-value pigments present in the bran layer can easily be extracted and utilized as functional foods and natural colourants and can replace synthetic dyes currently used in food, drug and cosmetics. Additionally, natural additives improve the nutritional value, appearance, texture, flavour, and storage properties of food products. The AF Zora variety is intended for the production of standard and special foods with nutritional benefits.

VARIETY: AGRAM
CROP: LINSEED
BREEDER: AGRITEC PLANT RESEARCH

'Agram' is a middle maturing brown seeded variety of linseed with blue colour flower, lower to medium stem length, good resistance to lodging and high root and stem base resistance to diseases. The seed yield is high with a medium iodine number of 165. The content of unsaturated fatty acids was changed through mutation breeding. The alpha linolenic acid content reaches up to 30%, linoleic acid up to 40%, the content of cyanogenic glycosides is very low, and the content of lignans (Secoisolariciresinol) is very high. This favourable combination of fatty acids and high content of the lignans predisposes the seed for a high-quality oil that is usable in the food industry. For these unique qualities, the variety is recommended to produce seed for edible oil production, healthy nutrition and bakery industry for baking, blending in dough etc.

VARIETY: ALOUETTE
CROP: POTATO
BREEDER: AGRICO

'Alouette' is one of the gems in the company's recent release of 'Next Generation' potatoes. The variety has a bright and strong red skin, and its long oval tubers have yellow flesh. It offers consumers a delicious texture and flavour when used in a range of potato dishes. For growers, Alouette is a strong and high-yielding variety under various agro-ecological conditions. The 'Next Generation' is a range of varieties that is unique because of their natural resistance to late blight, which is the most destructive of all potato diseases. Combined with their exceptional culinary qualities, these varieties hold great promise for both conventional and organic farming. Since Next Generation potatoes entail a significantly lower risk of crop failure, these varieties add to the options available for sustainable and healthy food production.



VARIETY: ARCHITECT
CROP: WINTER OILSEED RAPE
BREEDER: LIMAGRAIN

'Architect' has quickly become the #1 winter oilseed rape (WOSR) variety in Europe. It was the first hybrid variety in the market to offer resistance to Turnip Yellows Virus (TuYV), combined with high yield and pod shatter resistance. Within two years of its launch, 'Architect' became the first variety in Europe with more than 300,000 ha grown (i.e., 6% market share of the hybrid WOSR market). It has been cultivated in more than 20 countries across Europe achieving a first or second position in France, Czech Republic, Slovakia, Poland, Bulgaria, and Hungary. Its success is mainly due to the TuYV resistance, a disease transmitted by the peach-potato aphid (*Myzus persicae*) for which options for chemical control are limited. It is the result of more than 20 years of Limagrain research effort.

VARIETY: AS170
CROP: CORN
BREEDER: AS HIBRIDÍ

AS 170' is a special leafy type of corn silage hybrid, where one parental line carries the natural mutant dominant Leafy 1 gene, which leads to an increase in the total leaf number, particularly the number of leaves above the ear. In addition, the plants have lower ear attachment height and greater green biomass yield potential. All this results in a shorter vegetative period and a longer grain filling period compared to the normal analogues and more sugar content in green biomass. In general, these types of hybrids are having about 40% greater leaf area than normal type of hybrids. AS170 Silaz is bred primarily for silage purpose, has a decreased lignin content in its stalk and the kernels are large with a higher portion of soft endosperm and smaller particles of starch than in normal grain hybrids. The hybrid was co-developed with Glenn Seed Company.

VARIETY: CAYMAN
CROP: POTATO
BREEDER: HZPC

The name of potato variety 'Cayman' refers to a "strong car" and strong is exactly what this variety is: It combines a strong resistance package with a good drought and heat tolerance, so it can be grown everywhere and even can be used for organic production. Besides a good yield and a high dry matter content, the variety also comes with an excellent Late blight resistance, both in foliage and in the tubers. It has a very fast emergence and strong, well covering foliage, and growers can produce two or even three crops a year. The variety has a high adaptation, including a very good performance in the tropics. It is suitable for boiling, baking, home fries, crisps and, organic. A truly robust variety.

VARIETY: DKC4943
CROP: CORN
BREEDER: BAYER CROP SCIENCE

The maize hybrid 'DKC4943' was created in 2010 by Bayer's Hungarian breeder, Péter Kánczöl, PhD. This hybrid exemplifies the benefit of global collaboration in plant breeding associated with cutting-edge technologies and fast recycling of elite germplasm. Made from the cross between a French and a North American early-season corn line, it combines favourable traits from both regions: yield potential and consistency across various levels of production, wide adaptation, drought tolerance, excellent dry down, lodging tolerance, and year-to-year stability. Sold in 10 European countries, it has become a leading product on its maturity segment and is now sown on more than 10% of the maize surface, it has been leading in the Hungarian market for the last four years. It was elected three times 'Corn of the Year' in Central Europe, confirming its high and reliable performance across environments and farmers preferred selection.



RESEARCH

Observation Plots



2020

20 MOST INNOVATIVE PLANT VARIETIES

VARIETY: ES ALICIA
CROP: RAPESEED
BREEDER: LIDEA

'ES Alicia' is the earliest rapeseed variety on the market. It has the particularity of flowering about 10 days before all other varieties. And the innovative concept is that this variety is mixed in the same bag with another variety: 'ES Capello' in a ready to use mixture of up to 93% 'ES Capello' and 7% 'ES Alicia'. This concept is called 'Capello Protect' and is an alternative solution for controlling insect pests such as pollen beetles, which consume the flower buds of rapeseed and cause significant yield losses. These insects will be attracted to the flowers of ES Alicia and therefore will much less attack the main variety 'ES Capello', so 'ES Alicia' plays the role of a natural trap. This biological control makes it possible to avoid the need for an insecticide treatment and therefore to protect the user (farmer) and auxiliary insects (bees, other pollinators, etc.).

VARIETY: FABIAN
CROP: RYEGRASS
BREEDER: DLF

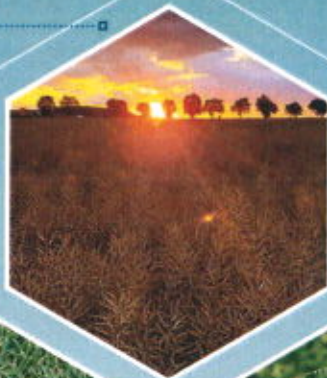
The variety 'Fabian' is one of the company's advanced turf tetraploid perennial ryegrass varieties, so-called 4turf. This 4turf represents a giant step in turf breeding with significant improved tolerance for diseases and drought stress. The variety has a turf quality and a high density that is challenging some of the best turf diploid perennial ryegrasses. In addition, it has both a better adaptability and stress tolerance than turf diploid perennial ryegrasses. In sport mixtures the variety is a crucial component, to cope with diseases and drought. Drought tolerance is an important factor in sport field management and having drought tolerant turf allows professional turf managers to limit pitch irrigation, which is a key point in reducing the risks of disease attacks and the best way to reduce annual bluegrass.

VARIETY: FIAMMETTA KWS
CROP: SUGAR BEET
BREEDER: KWS

The variety 'Fiammetta KWS' is considered a breakthrough in breeding for *Cercospora* tolerance in sugar beet and is the first variety out of the highly innovative KWS CR+ product generation. In contrast to other sugar beet varieties with current *Cercospora* tolerance, this variety combines a new, very high level of *Cercospora* tolerance while maintaining a very high yield performance. *Cercospora* is a fungal disease that causes major damage to roughly two-thirds of the global sugarbeet acreage worldwide. The impact is that the amount of fungicides previously used to combat this leaf disease can be reduced significantly. It represents an excellent example of how the company's breeding work contributes to sustainable cultivation and ensures productivity and competitiveness of sugarbeet cropping.

VARIETY: FITIS
CROP: SUGAR BEET
BREEDER: SES VANDERHAVE

The variety 'Fitis' was registered in February 2021 in Germany as a nematode resistant variety with strong tolerance against 'Syndrome basses richesses' or simply SBR. This disease is known for strongly reducing sugar content (up to 30%) and root yield in sugar beet. SBR symptoms include yellowing of older leaves, lanceolate asymmetric young leaves and necrosis of vascular root bundles and can easily be confused with other biotic or abiotic stresses. The disease is a real threat for the continuity of sugar beet growing in regions infected by SBR. Spreading of the disease is facilitated by two plant pathogenic bacteria and transmitted by the planthopper *Pentastiridius leporinus*. Since control of the planthopper is considered to be impossible, the company explored the possibilities of a genetic solution. This variety is the first genetic solution for farmers and sugar industry in areas suffering from SBR.





VARIETY: GREEN QUEEN
CROP: ARTICHOKE
BREEDER: BASF

Artichoke 'Green Queen' is a hybrid variety that offers advantages to growers, traders, retailers and consumers. It has a strong vigour capable of coping with various soil and stress types, while producing the desired head sizes and uniformity required for the domestic and export markets. The post-harvest life of the heads reduces losses, increases shelf-life and its fresh appearance and good taste contributes to repeat purchases. Green Queen genetics, together with collaboration along the value chain, is revitalizing a traditional consumer market and opening new opportunities for export and processing markets. As a source of vitamin C, vitamin K, folate and copper, artichoke contributes to a more diverse and healthy diet.



VARIETY: KESIA
CROP: EGGPLANT
BREEDER: RIJK ZWAAN

Aubergine variety 'Kesia' was recently launched by Rijk Zwaan and is its first variety in the CleanLeaf series. This represents a new generation of aubergine varieties with very few trichomes (hairs), making integrated pest management (IPM) easier, and helping growers to cultivate residue-free products more efficiently and predictably. In addition, the variety has a good shelf life, which leads to less food waste. Consumers have high expectations in terms of organic produce and low pesticide levels. With this approach, the company enables sustainable production and helps retailers to achieve their sustainability goals. Not only are the plants themselves hairless, but so too is the calyx of the aubergine, plus it is greener compared to conventional varieties. This makes it more appealing to consumers since they associate this greener calyx with fresh and green.



VARIETY: INNOVATOR
CROP: SHALLOT
BREEDER: DE GROOT EN SLOOT

The shallot variety 'Innovator' was developed after years of breeding by De Groot en Slaat, in cooperation with Bejo and is the first downy mildew resistant shallot from seed. It is a hybrid variety with a slightly longer bulb and a distinct colour, which is suitable for the long day areas. Downy mildew is a severe problem in production fields in many parts of the world. It infects the leaves of the shallot, eventually causing major losses in harvests or destroying crops completely. 'Innovator' is well suited to the organic market but is also very desirable for the conventional market, as it requires less crop protection. The variety offers very healthy propagation material as a shallot from seed, delivering a huge advantage compared to a shallot from set.



VARIETY: NS BLACKSTAR
CROP: SOYBEAN
BREEDER: THE INSTITUTE OF FIELD AND VEGETABLE CROPS

'NS Blackstar' is a soybean variety with a black seedcoat, resulting from polyphenolic compounds or anthocyanins. In addition, the variety contains other polyphenols, e.g., derivatives of flavan-3-ol (twice as high compared to grapes or apples), isoflavone, quercetin, larycitrin, and isochromanin, indicating an extraordinary antioxidant capacity. In addition to their important role for the plants, polyphenols also have highly beneficial effects on human and animal health. Studies have confirmed antioxidant and anti-inflammatory effects of polyphenols (combating cardiovascular diseases and atherosclerosis) as well as an important role in the prevention of obesity and hyperglycaemia. Because of the higher content of polyphenols compared to other black soybean cultivars, and a nutritional quality identical to the other black and yellow soybean varieties, NS Blackstar belongs to the group of functional, value-added foods, with a great prospect in the food or pharmaceutical industry.



RESEARCH
 Observation Plots



2020 20 MOST INNOVATIVE PLANT VARIETIES

VARIETY: P8888
CROP: CORN
BREEDER: CORTEVA AGRISCIENCE

'P8888' is an early-maturity silage corn hybrid which exhibits all attributes that characterize the new m3TM commercial line-up: pure dent grain texture, high degradable starch, top silage yield performance, yield stability, wide area of adaptation, excellent agronomics, stay green and high fibre digestibility. These characteristics contribute to increase dairy farmers' value creation through a more flexible harvest time, higher milk production and better product quality. The m3TM corn silage concept is the result of an innovative product development strategy created by the European team of Corteva Agriscience and aimed at providing dairy farmers with the best digestible energy yield per hectare.



VARIETY: RED1
CROP: BROCCOLI
BREEDER: BEJO ZADEN

The broccoli variety 'Red1' is a true sensation. It is a revolutionary concept, based on the variety Burgundy, and aimed at the consumer vegetable market. The variety combines healthy nutrition with an exceptional flavour in an original way. This purple sprouting broccoli, comprising tender stalks topped with a small floret, whose unique features bring colour and originality to any dish. It is a flavourful, healthy, and eye-catching broccoli in a sustainable packaging. Thanks to high levels of naturally produced glucosinolate compounds, Vitamin C and antioxidant activity, this variety is an extremely healthy vegetable. Its colour provides more antioxidant compounds than green broccoli, which consolidates and boosts its power as a functional food. Next to that, it is the first one-cut hybrid purple sprouting broccoli variety. The variety was bred by Bejo, in cooperation with Elsoms.



VARIETY: SYNTHIA
CROP: SPRING TURNIP RAPE
BREEDER: BOREAL PLANT BREEDING

Spring turnip rape (*Brassica rapa*) has lower harvest rates than spring oilseed rape (*B. napus*), but it is a very valuable oil crop in the north of Europe with its shorter growing time demand. The variety 'Synthia' is the first synthetic spring turnip rape variety and benefits greatly from the heterosis effect. It has a 10% better yield than any of the conventional turnip rape varieties. It can also be distinguished from those through its oilseed rape type stiff and strong stem, that brings a greatly improved crop security for farming in the north of Europe.

VARIETY: TERAPUR
CROP: CARROT
BREEDER: VILMORIN-MIKADO

The variety 'Terapur' is an innovative and agroecological plant solution to combat the nematode *Heterodera carotae*. Selected from more than 3,700 wild plants, this variety is not a consumable carrot but a trap crop which acts like a biocontrol solution. White in colour, resembling a type of wild carrot, it has a very large root network, and spreading waxy foliage. Endowed with resistance to the nematode *Heterodera carotae*, the planting of this variety makes it possible to significantly reduce the population of this pest in the soil. For carrot growers, this innovative plant solution is the first effective response to control this cyst nematode since the European Union banned dichloropropene in 2009.

HONOURABLE MENTIONS

We had so many nominations come in, that it was hard to limit it down to 20. So, apart from the list above, there were several other innovative varieties that we did not want to let go by unnoticed, so we placed them under 'Honourable mentions' and these are: spring crown vetch variety 'Korona' from the Research Institute for Fodder Crops, sunflower variety 'NS H 7749' from the Institute of Field and Vegetable Crops, wheat variety 'Pexeso' from Selgen, and foxtail millet variety 'Rucereus' from the Crop Research Institute.

