

Asparagus AWorld



THE 100% ASPARAGUS MAGAZINE

#4
YEAR 2022

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TECHNICAL

Workers required for asparagus

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TECHNICAL

How to be ready for the robots **P.14**



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Editor's letter



Guy Dubon and Christian Befve,
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**Asparagus
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Are robots a “disruptive evolution”?

When the steam engine was invented at the end of the eighteenth century, it multiplied the power of man and beast. Tipping a part of humanity into the industrial era, this innovation was described as a “disruptive evolution”. Today’s new technologies are now paving the way for robotics, which are already in use in some sectors and are currently being discovered in agriculture too. Milking robots have quickly become established on dairy farms, weeding robots are spreading further afield and harvesting robots are making their appearance in fields.

The first asparagus harvesting robots, featured in this edition of Asparagus World, show that asparagus is at the very forefront of innovation. Will these too bring with them disruptive developments into the world of agriculture? But more than simply replacing the labour of the women and men who harvest asparagus, these robots are already opening the way to changes in cultivation techniques as well

as a new approach to varietal selection and many other adaptations. Other innovations are yet to come thanks in particular to robots’ capacity to collect data in the field and transform it into useful information. Such information may lead to greater production efficiency and help make asparagus more affordable, thus increasing consumption.

Just look at our phones, which have evolved from landlines to being packed with connected high-tech!

In two decades, smartphones have become the 4th “disruptive evolution” in the development of human communication, after speech, writing and printing (according to philosopher, Michel Serres). Could anyone have predicted that a simple telephone would become the most powerful “political tool” in the world? Let’s hope that the new world shaped by robotics is, above all, one that truly benefits humankind, and not like the dystopia imagined by Aldous Huxley in his 1932 book *Brave New World*.

by Guy Dubon,

Co-editor of *Asparagus World*

and Editor of *Réussir Fruits & Légumes*



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Planasa



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World asparagus experts gathering in Córdoba in June

The latest in the field of asparagus research will be shared at the 15th edition of the International Asparagus Symposium

BY JULIE BUTLER [@FreshScribe](#)

Designed to promote exchange of knowledge and information among participants, the 15th International Asparagus Symposium is set to take place over June 12-15, 2022, in Córdoba, Spain. Welcoming all those engaged in research, teaching, cultivation, or public services related to asparagus cultivation and product quality, the symposium is organised by the Asparagus Working Group of the International Society for Horticultural Science (ISHS) and the University of Córdoba (UCO). Being held in an emblematic Neomudejar style building, the Rectorate of the University of Córdoba, it will feature oral presentations, poster sessions, an exhibition, and seminar discussions, as well as post-seminar tours to visit farmers and research locations, and an opportunity to experience Córdoba and its culture. The following major topics have been proposed: genetics and breeding,

agronomy and production systems, physiology and biochemistry, pathology and pest management, nutraceuticals, post-harvest, and marketing. Abstracts of papers for oral presentations and posters on topics covering the entire field of asparagus research were called for by the March 1 deadline. "We are looking forward to a large turnout, and to a stimulating, diverse, interactive and high quality symposium. We cordially invite you to join us and participate in both scientific and social events," the symposium organising committee says. *AW*



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15th International
Asparagus Symposium
IAS2022
CÓRDOBA (SPAIN)
June 12th-15th, 2022



MORE INFO

For more information visit <https://www.ias2022.com>

The most complicated season in Caborca's history?

There was strong demand from US retailers for spears from what is one of Mexico's top producer regions but an unexpected cold snap meant supply fell disastrously short

BY JULIE BUTLER [@FreshScribe](#)

Lots of store promotions but not so much asparagus to sell – that was the case in the US early this year. What felt like the longest, coldest winter of the last five years caused about a 2-month delay to the harvest in Caborca, which is usually in full swing by mid-January. Located in Mexico's top asparagus-growing state of Sonora, Caborca is mainly geared at the Jan-April window in the US and has a fast and furious season, sending up to 2 million or more 5 kg equivalent boxes a week. "Retail must be below \$2.99/lb to shift this volume, because if it's not very cheap it's not going to move," an industry insider said. In February, US supermarkets were aggressively promoting asparagus in readiness for the Caborca crop, some advertising it at \$1.99/lb, he said. But 3-4 weeks of unseasonably cold weather hit over Feb-March

and suddenly there was no asparagus from Caborca to sell, leading stores to cite force majeure and cancel promotions. Then it warmed up and a flush came on and Caborca could not move its production, causing prices to drop dramatically. Asparagus was even seen as low as \$1.44/lb on March 30 at a Walmart store in Florida. April 5 is when US retailers usually start their ads for Easter promotions, providing a new window of opportunity to move big volumes from Caborca. As at April 7, the previous weeks of hotter weather in Caborca had favored production and growers were sending over about 1.7 million 5 kg equivalents a week. The April 8, USDA Specialty Crops Market News report showed a weighted average price of \$2.61/lb for conventional fresh green asparagus, based on advertised retail sale prices to consumers in 5,568 major supermarkets. *AW*



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The unseasonable weather caused price fluctuations; asparagus was even reported at as low as \$1.44/lb at a Walmart store in Florida on March 30.

Trade fair for asparagus production

Trade fair duo expoSE & expoDirekt from November 23rd to 24th, 2022 in Karlsruhe

BY GUY DUBON

Around 400 exhibitors from 12 nations will be present from November 23rd to 24th, 2022 at the 26th expoSE – Europe's leading trade fair for asparagus and berry production – and the 11th expoDirekt – Germany's largest trade fair for agricultural direct marketing. Being held over about 25,000 square meters at the Karlsruhe Trade Fair Centre, the duo will feature companies showcasing innovations in asparagus and berry cultivation, as well as agricultural direct marketing. The organiser of the trade fairs is the Verband Süddeutscher Spargel- und Erdbeerbauer e. V. (VSSE – Association of Southern German Asparagus and Strawberry Growers).

expoSE and expoDirekt innovation awards

Exhibitors at expoSE and expoDirekt have until this September 30 to submit their innovations for the innovation award. An independent expert jury will examine the entries and select the winners, with the award ceremony to be held on the first day of the fair. Further information on the innovation award application can be found here:

<https://www.expo-se.de/for-exhibitors/innovations-awards/?L=2>



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The Association of Southern German Asparagus and Strawberry Growers e. V.

With over 660 members, the Association of Southern German Asparagus and Strawberry Growers e. V. (VSSE) is Germany's largest association for asparagus and strawberry growers. Since 1996, the VSSE has been the organiser of expoSE – Europe's leading trade fair for asparagus and berry production, and since 2011 it has also organised Germany's largest agricultural direct marketing trade fair, expoDirekt. *AW*

You can find more information at www.expo-se.de

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WHAT'S NEW IN ASPARAGUS

Asparagus Decline Syndrome (ADS) is one of the main phytosanitary problems affecting the asparagus crop worldwide. Significant efforts are being made by research teams around the world to deal with this major threat to the future of asparagus.

BY JULIEN ROCHERIEUX

Asparagus Decline Syndrome (ADS) is characterised by a gradual loss of vigour, which can even lead to the death of affected plants, causing heavy economic losses and limiting the replanting of asparagus in soils where the crop had previously been cultivated. This complex syndrome involves both abiotic factors, such as water stress or allelopathic compounds, and biotic factors, with *Fusarium* playing a predominant role. Among the various species of *Fusarium*, it is *F. oxysporum* f. sp. *asparagi* and *F. proliferatum* that seem the most pathogenic, although the composition of the fungal consortium is highly variable depending on the geographical region under study. Major efforts are being made by the scientific community to understand the causes of the syndrome and to identify sustainable solutions for controlling it.

SPAIN



Lopez-Moreno et al. (2021) studied the effect of different treatments against asparagus decline syndrome on the physiological parameters and nutritional quality of the spears. Four different treatments were applied to asparagus plots that were strongly affected by decline syndrome: untreated control soil, bio-fumigation with Brassica pellets, bio-fumigation with chicken manure pellets, and disinfection of the soil with Dazomet. The results showed that the Brassica pellets and Dazomet treatments were the most effective.

To avoid the use of agrochemicals, the Capote research team (2021) proposes the use of alternative methods to control the main *Fusarium* species involved in asparagus decline syndrome. In vitro antagonism assays showed that bacteria inhibited the mycelium growth of the three *Fusarium* species. *Bacillus paralicheniformis* Hvs2 and *Bacillus velezensis* FC37 were the most effective in controlling pathogenic *F. proliferatum* and *F. oxysporum* f. sp. *Asparagi*. The results suggest that these strains could be used as potential biocontrol agents to provide a sustainable and environmentally friendly control strategy for ADS-affected fields.

EXPERT

Julien Rocherieux,
expert consultant at
Agrosome



GERMANY



A team led by Nothnagel (2019) investigated whether breeding cultivars resistant to *F. oxysporum* would be the most efficient strategy for pathogen control. In their study, they developed a nondestructive bioassay that is simple to implement and highly reproductive to determine the resistance behaviour of 16 asparagus genotypes to *F. oxysporum*. The 16 asparagus cultivars showed different levels of susceptibility, whereas the wild relative *A. densiflorus* was confirmed to be resistant.

SCIENCE?

JAPAN



Kato-Nogushi et al. (2018) studied the autotoxicity hypothesis in asparagus crops based on the consideration that it is not clear what compounds are involved. They showed that extracts from soils in which asparagus had been cultivated for ten years inhibited the growth of asparagus seedlings. By purifying the extracts, it was possible to isolate the growth inhibitory substance and identify it as a trans-cinnamic acid. Therefore, trans-cinnamic acid may contribute to the autotoxic effect of asparagus soils, and might be in part responsible for "asparagus decline" and the replanted asparagus problem.

POLAND



Andrzejac and Janowska (2021) determined the species composition of fungi of the *Fusarium* genus found on white *Asparagus officinalis* spears, using samples collected in two different plantations. Six species of fungi of the *Fusarium* genus were identified in the asparagus spears, with *F. oxysporum* being the greatest threat. The researchers also found that the spears harvested at the latest date were the most heavily colonised by fungi and that the isolates of fungi collected exhibited pathogenicity against asparagus plants.

CHINA



Zhang et al. (2021) explored the effects of *Fusarium proliferatum* infection on the postharvest quality and respiratory metabolism of green asparagus. The soluble sugar concentration, titratable acidity and key enzyme activities of infected asparagus were measured during post-harvest storage. The results demonstrate that *F. proliferatum* caused quality deterioration and the impairment of respiratory metabolism in postharvest asparagus, helping to clarify the relationships between pathogen infection, physiological metabolism, and asparagus quality.



Workers required for asparagus

80–90% of the asparagus harvest in the production areas of northern Europe (Germany, Holland, Belgium, France) is carried out by workers from other countries (generally Eastern European).

Throughout the world, labour is a determining factor in asparagus production. Three ways to optimise labour are the adapting of plantations, mechanisation and workforce management.

BY GUY DUBON

Asparagus production is a “great traveller”. For several decades, it has moved around the world depending on the availability and cost of labour. Moving away from the areas of consump-

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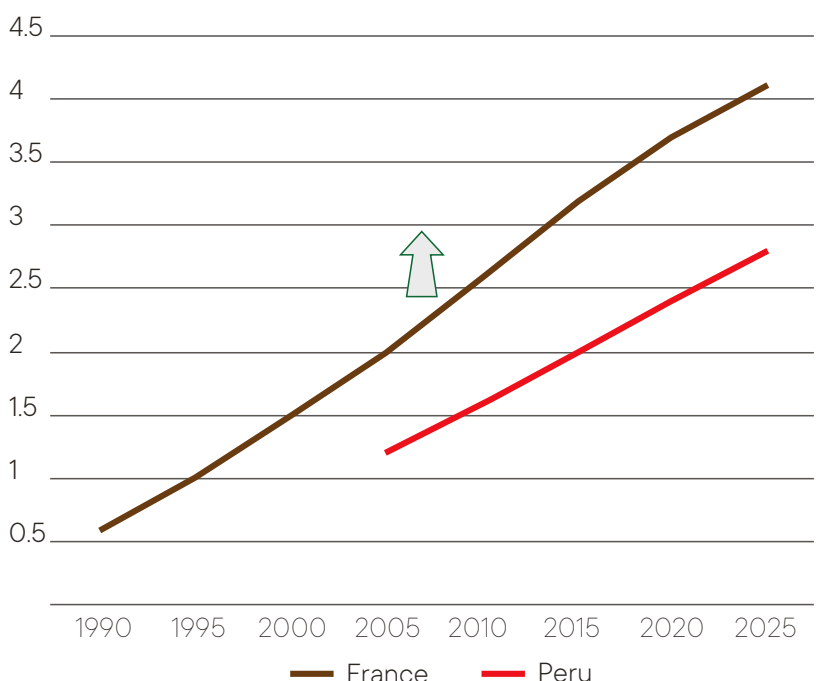
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tion (Europe, United States), other production areas have emerged, sometimes in a quite astounding way, offering more favourable climatology, out-of-season or even year-round production, and, above all, low labour costs. It is possible to chart the route of asparagus around the world. Starting out from Europe, where a day's work costs €110 in France, it then established itself in Peru (€20/day), followed by China (€10/day) and now Namibia (€5/day) and Ethiopia (€3/day) (see Asparagus World n°3). To ensure profitability, these asparagus-producing regions must keep labour costs low (harvesting + packaging + logistics) to offset rising export costs. For some destinations, such as Peru, it can cost €2/kg for air transport and €0.40/kg for three-week sea transport in containers.

Increases in salaries and expenses

This economic model is now being called into question as labour is becoming the major problem in all asparagus production areas globally. Across the planet, agriculture is the most strenuous, poorly paid and least socially rewarding activity for workers. Asparagus cultivation is therefore in competition with other activities, such as construction, industry and tourism, which offer more attractive employment options. In some countries, especially in Europe, asparagus producers use foreign workers, with 80-90% of the asparagus harvest in production areas of northern Europe (Germany, Holland, Belgium, France) carried out by workers from other countries (generally from Eastern Europe). This labour force accounts for 50-60% of total harvest workers in Italy and 20-30% in Spain. Brexit has made the situation even more difficult for British producers. Ali Capper, a member of the National Farmers Union (NFU), Britain's main agricultural union, said in October 2021 that there was a shortfall of 34% of seasonal workers in July on fruit and vegetable farms. "We have never experienced such a shortage. This is a real crisis," she warned. In response, the UK government plans to extend its seasonal worker visa programme until the end of 2024. Thus, 30,000 foreign workers (up to 40,000 if necessary) will be able to go to the United Kingdom for up to six months. At the same time, the government has asked the sector to prepare a plan to reduce its dependence on foreign labour and improve wages and working conditions. ➔

NUMBER OF KILOS OF ASPARAGUS PAID PER HOUR OF LABOUR



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INFLUENCE OF TEMPERATURE AT THE CROWN ON PRODUCTION CONCENTRATION

Plateau temperature	Production kg/day/ha	% growth
12°C	0	
13°C	20	
14°C	50	150%
15°C	80	60%
16°C	110	37%
17°C	140	27%
18°C	170	21%
19°C	200	17%

Do not exceed 23°C in the center of the mound

➔ Responding to the labour shortage

Wage and cost increases are also expected in Germany. “While last year’s production was partly penalised by the absence of foreign, mainly Polish and Romanian, seasonal workers, it is the cost of labour that is now worrying German asparagus producers,” said VSSE officials. The cost of labour per hour used to be just €5.50, but in 2021, it was €9.80 and the rate is expected to soon rise to €12 due to an increase in both workers’ wages and expenses. This is a prospect which is worrying some German companies, the largest of which employ up to 1,000 seasonal workers. The rise in the cost of labour is also linked to increasing ancillary costs such as housing, transport and medical tests related to Covid. A study in France in the 90s found that while it was necessary to produce 0.6 kg of asparagus in 1990 to pay for an hour of labour, by 2000, this figure had risen to 1.5 kg and 2.6 kg in 2010. It now takes more than 3.7 kg and will require over 4.1 kg of asparagus in 2025. In Peru, data from 2005 onwards indicate that 1.2 kg per hour of work were required to cover labour costs. In 2020, it took 2.3 kg, and the figure is projected to rise to 2.8 kg by 2025. Although the cost of an hour’s work is lower in Peru, the growth curves are parallel from one country to another (see Figure 1). “The strategies to be implemented to respond to labour shortages and cost increases are similar from one country to another,” said asparagus consultant Didier Duprat, at the second conference of the 4th International Asparagus Days (IAD). According to the specialist, it is necessary to adapt plantations to ensure gains in productivity, mechanise farming including harvesting and to better “manage” workers.

A 34% cut in distance travelled

Adapting plantations to increase productivity levels includes extending planting distances while intensifying the number of plants per linear metre to maintain the high density of asparagus beds. This technique reduces the cost of harvesting by about 30% as the picker travels less distance and collects more kilos per hour. It also saves time in terms of handling plastics and maintenance (spraying, tillage). “By increasing row gauge from 2.30 m to 3.50 m, we reduce the length of row per hectare from 4.34 km to 2.85 km, i.e. 34% less distance,” said Didier Duprat. Presuming a picker makes 50 passages per hectare per year, the number of kilometres travelled would thus fall from 217 km to 142 km with the largest gauge (3.50 m). Reducing harvesting costs in this way can save as much as €3,400 per ha. Establishing rows with the longest possible length to limit U-turns can also optimise harvest time. Duprat said: “The producer must also optimise each hour worked by preparing a production forecast based on measurable parameters, such as the root volume of the plot, the



© Baggioni

Brix rate, and the state of the vegetation in the autumn.”

Levers for improvement: mechanisation & management

Similarly, ensuring the good condition of plastic films and ridging to obtain flexible mounds also provides opportunities for saving time. The management of thermal plastics is an important element in intensifying the volumes harvested in one pass, with the aim of grouping production. Just a 1°C increase in plateau level can lead to a rise in production of 30 kg per day per ha. The improvement in the concentration of production is very marked with low temperatures (14°-

16°) in the mound, but declines beyond 19° and should not exceed 23°C (see Table 2). The use of temperature probes (in the mound) allows better management of plastics, and harvest peaks can be anticipated to smooth out production. Mechanisation is one of the levers for improvement. “At the moment, everything that can be done by a machine is cheaper,” said Duprat, citing the example of crop assistance machines for green asparagus and those for lifting plastics in white asparagus cultivation. Machines offer savings in harvesting time of 30-40%, depending on several criteria, particularly the size of plots. The longer the rows, the greater the gain. Some manufacturers report a gain of 50% on their commercial media. These assistance machines are in widespread use among asparagus producers. Engels, the main manufacturer alongside Baggioni (but there are also others), celebrated the sale of its 10,000th machine in 2020. These electric machines can be equipped with solar panels to allow greater autonomy in the field and avoid the need for the tedious handling of batteries for recharging purposes. “Robots are already in development and they will evolve yet further; but in the long term, they will be one of the solutions, especially for large companies,” said the specialist. These recent advances also bring new perspectives as well as major future developments that are still difficult to define (see article p14).

Workforce management is also becoming a determining factor, particularly when it comes to maintaining employee loyalty. The recruitment and retention of seasonal employees constitutes a less arduous process, but needs to be better organised and therefore better managed. The producer must also optimise each hour worked by preparing a production forecast

based on measurable parameters, such as the root volume of a plot, the Brix rate, and the state of the vegetation in autumn. But the producer must also monitor temperatures in the mound daily during the harvest to anticipate volumes and therefore staff needs. It is essential to provide workers with suitable accommodation, decent working conditions and sensible working hours. The use of social networks by some employers to maintain links with their seasonal workers is also a good example to follow. Besides focusing on salary, firms must also respect rest days, ensure quality accommodation and provide a welcome for workers. **AW**

“At the moment, everything that can be done by a machine is cheaper,” said Didier Duprat, citing the example of crop assistance machines for green asparagus.

The electric machines can be equipped with solar panels to allow greater autonomy in the field and avoid the need for tedious battery recharging.



© Base-Innovation



TOUTES LES NOUVEAUTÉS : DES BATTERIES AU LITHIUM AUX ENROULEURS

Malgré une période difficile en raison des coûts en augmentation sur tous les fronts et des réponses des marchés souvent insatisfaisantes, il ne faut pas manquer l'occasion d'économiser en termes de main-d'œuvre et d'efficacité, grâce aux meilleures technologies.

À cet égard, l'entreprise Bagioni propose des nouveautés importantes dans le secteur de l'asperge. Les machines d'aide pour la gestion et la récolte des asperges accueillent une nouveauté : les batteries au lithium. L'entreprise Bagioni crée de nouvelles opportunités en réalisant des batteries au lithium s'adaptant à n'importe quelle machine existante, et non pas seulement aux machines de nouvelle construction.

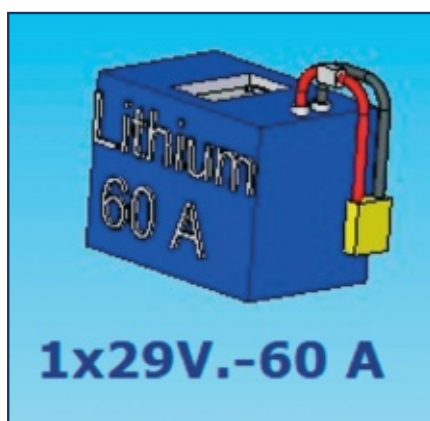
Pour les machines neuves dotées d'un régulateur de tension, nous avons breveté un nouveau type de batterie à tension plus élevée (batterie déchargée à 24 volts – batterie chargée entre 28,8 et 32 V). Cela nous permet de main-

tenir la tension des moteurs stable à 24 volts, y compris lorsque la batterie est complètement déchargée. Étant donné que la puissance correspond à la tension (volts) multipliée par l'intensité (ampères), le maintien des volts au-dessus du seuil des 24 V permet d'augmenter les ampères disponibles pour l'autonomie et de maintenir le moteur ainsi que tous les composants électroniques à une température idéale.

Les batteries au lithium présentent d'autres grands avantages : la légèreté (10 kg), la durée de vie (plus de 1 000 cycles de recharge), aucun entretien ni recharge pendant les périodes d'inactivité et surtout elles ne font pas l'objet de vol, puisqu'aucun véhicule ne

fonctionne à 28,8/32 V.

Le coût initial constitue le seul inconvénient, mais il s'agit d'un investissement rapidement amorti.



ENROULEUR A10

Nous continuons d'investir dans de nouveaux projets, bien que cela implique de consacrer du temps à la conception et à la mise au point de machines, et d'essayer aussi quelques déceptions. Mais l'important est d'être constant, sans se laisser abattre.

Cela fait désormais 5 ans que nous continuons à modifier l'enrouleur de film en plastique, car nous souhaitons atteindre certains objectifs que nous nous sommes fixés, aussi bien en termes de technologie que de prix. Nous y sommes parvenus il y a 1 an, avec le nouveau modèle A10. Voici ce qu'il offre :

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How to be **ready for the robots**

© Guy Dubon



The arrival of robots in asparagus plantations is a breakthrough innovation. How should it be anticipated and what are the consequences when machines come to replace the hand of man.

BY GUY DUBON

The production model for asparagus has been developed over decades based on constraints related to the availability and cost of labour. However, the 2020s have seen the arrival of harvesting robots in asparagus fields. Asparagus is not alone in undergoing this technological revolution; it is also happening for crops such as apples, strawberries, raspberries and tomatoes. In some cases, robots are even in the commercialisation phase, such as the strawberry picking robot Rubion from Belgian start-up Octinio. In general these machines combine a vision system, a moving arm and some kind of gripper, and are intended for high value crops which are also labour-intensive.

Which fields are best suited for robotisation?

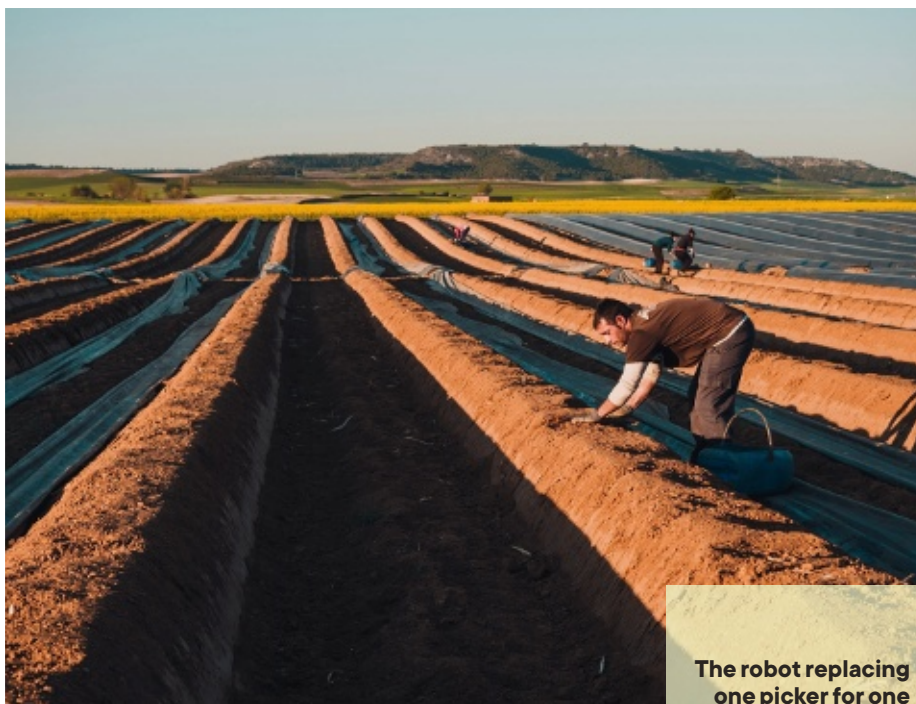
Asparagus fits this bill, making it a crop of interest to machinery companies as well as high tech start-ups able to adapt their know-how in vision, robotics and artificial intelligence to agriculture. While for other crops there is not much hope of the

While prototypes for other crops are unlikely to be ready for use in the near future, several robots are already in professional use in asparagus fields.

prototypes now being tested being ready for use in the near future, several robots are already in professional use on asparagus farms (see box). But this technological advance in robotic asparagus harvesting is giving rise to new questions. What kind of plot will be best suited to robotisation? What design criteria should be taken into account or modified? In what ways? In any case, optimising the movement of the robot and facilitating access of the harvesting element to the spears are objectives for improvement. Therefore, as soon as a plot has been chosen, robotisation must be considered. The flattest possible ground will facilitate the mobility of the robot while also ensuring that the picking elements work vertically, perpendicular to the furrow. Deep soil of a sandy texture will also help with movement and gripping. Stones and plant residue providing obstacles to the identification of asparagus and the action of picking tools must be eliminated.

Detecting asparagus below the surface

The constraints of robotic harvesting are also to be taken into account when choosing varieties. Currently, breeders of new varieties are not yet considering the adaptation to robotic harvesting as a varietal selection criterion, but it can be considered that varieties producing large and homogeneous asparagus, with a good distribution per linear meter, make it possible to obtain good harvest yields per hectare. Varieties whose rootstock (crowns) spread out will provide the best distribution over the width of the row. Hardy turion varieties reduce the number of broken or damaged asparagus. In the same way, double-row planting offers a larger picking area that makes it easy to identify each asparagus. Will a change be needed from the current width of mounds, which is apt for manual harvesting? Favouring large distances between rows will have the same advantages that it does for manual harvesting (see page 10). This method of implantation, with over 3.5 metres between rows, is already known to limit the number of kilometres travelled per hectare by humans but also by the robot in order to harvest the maximum area and reduce the number of time-consuming row changes. Similarly,



© Luis San Jose

the maximum row length minimises time spent at the end of the row and handling plastics. Cultivation on high mounds (see Asparagus World n°3) makes it easier for the robots to work during bad wea- ➔

The robot replacing one picker for one hectare means the problems of recruitment and management of asparagus pickers are greatly reduced.



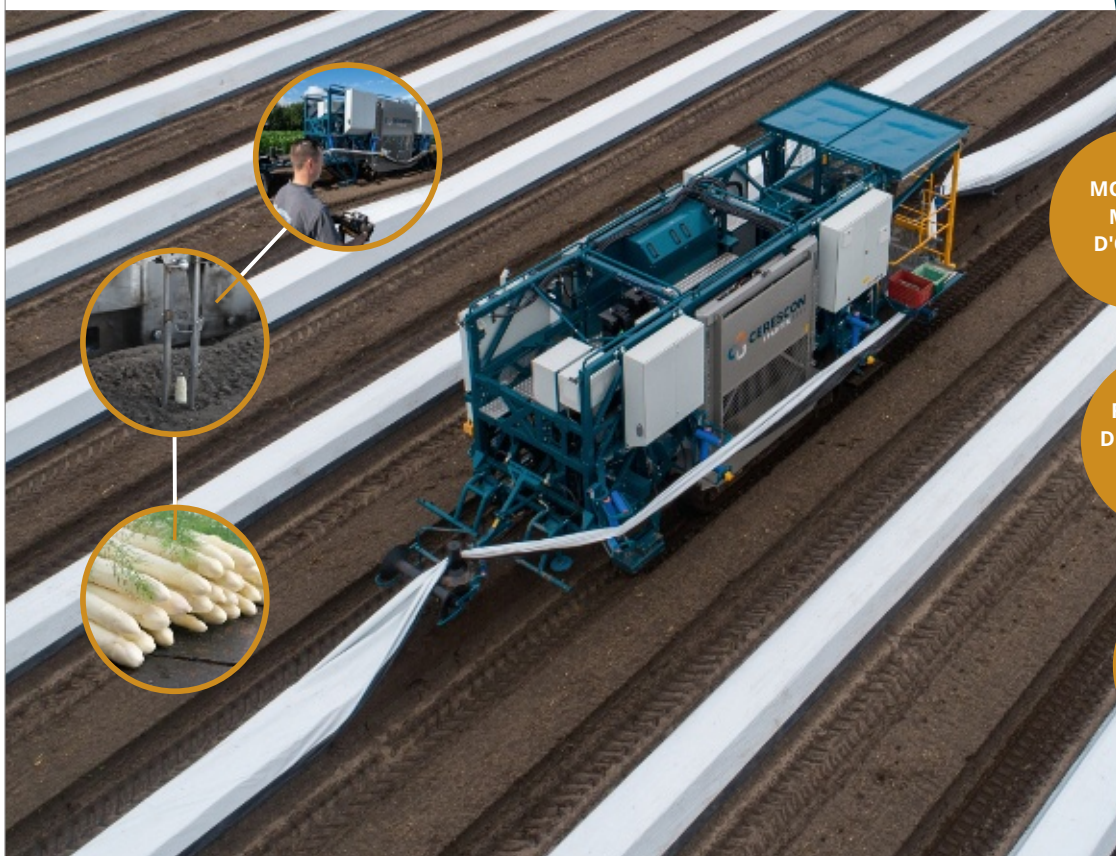
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The maximum row length avoids wasting time at the end of the row and handling plastics.

➔ ther but also achieves the lightest mound soil possible that will facilitate the work of the picking tools. However, the automated arms of the robots make it impossible to use hoops perpendicular to the row. On the other hand, there is the possibility in some cases of using use hoops parallel to the row and allow the use of two independent or associated plastic films. Some technologies that detect asparagus below the surface make it possible to improve the quality of the product. They also offer the possibility of not using mulching but are exposed to risks of cooling, compaction and humification of the mound.

Optimising the machine's work

Replacing the number of manual pickers needed for one hectare with a robot harvester would greatly reduce the labour recruitment and management problems for farmers. Nevertheless, the robot cannot be entirely free from the presence of operators. While fewer in number, the need for labour still exists and is redirected towards more qualified people. Supporting the proper functioning of a robot requires new specialised computer skills. Driving a picking robot has become a specialist job, requiring training and upgrading needs. In addition, the optimisation of the work of the machine requires continuous work over a long period, up to 24 hours on 7 days a week. This means that teams of drivers with equivalent skills are required. The management of the equipment fleet (number of robots corresponding to harvesting needs) and the maintenance of the robots are also determining factors in the profitability of major investments. Robots are chosen based on the reliability of the equipment, the after-sales service and the proximity of people specialised in robotics for the maintenance. Each hour a machine is immobilised has direct consequences on the viability of the site and can have dramatic repercussions in the short term for the necessary regular monitoring and picking of a crop and on the supply to the market, and in the medium term on the return on investment in the equipment. *Av*

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Will robotisation have an impact on asparagus production?

Christian Befve, international consultant in asparagus cultivation, offers some thoughts on the impact of the arrival of robots in asparagus fields.

The arrival of robotic harvesting in asparagus production represents a “breakthrough innovation”. These machines change the status of asparagus from “manual harvesting” to “mechanised cultivation”. Several impacts can be envisaged, without them necessarily coming to full fruition. By ensuring the daily harvest of several hectares, robots save asparagus from its dependence on increasingly scarce, expensive and demanding harvest labour. Manual harvesting drives people to move from one country to another, and sometimes over great distances, to come and pick asparagus. It is also labour that has led asparagus to move its production areas around the world in constant search of lower costs. Would robotization bring asparagus production back to countries that lack human pickers but can afford to pay for this technology? The theory is that it will be cheaper to harvest a kilo of asparagus by robot. In view of the level of investment in one or more machines, this assumption will only be possible with the machines working at optimum level and in the best conditions for as long as possible to harvest the maximum surface area and volume. The risk therefore exists of a fall in the average

price of asparagus. The impact on the quality of the harvest, too. This risk exists particularly in the event of a prolonged failure of the robot which then affects the management of all the plots. The solution would be in constructing plots with several robots as well as a small team of manual harvesters who would collect the short rows or those rows not easily accessed by the robot and who could partially compensate for a failure of the robot. As of today, it is difficult to assess the impact of robotic harvesting on the supply of the asparagus market and its profitability. For the time being, the development of robot harvesting is likely only to concern large farms. Currently, it can be estimated that 30 to 40% of European white asparagus plantations are “robotisable”. However, it may be that we are already noticing some consequences on the supply of asparagus with the fear of a greater presence of lower quality turions. The fall in the cost of harvesting by robot, along with the arrival of new operators previously put off by the need to manage a workforce

could contribute to the supply of asparagus becoming more banal while for the moment it remains a vegetable of modest consumption in terms of the size of its customer base. Would the fall in prices attract new consumers? Will there be a need to differentiate between two products, the “machine-harvested” and the “hand-harvested” as is done for the green bean? These and other questions will only be answered with the imminent deployment of robots in the fields.

Currently, it can be estimated that 30 to 40% of European white asparagus plantations are “robotisable”, believes Christian Befve.

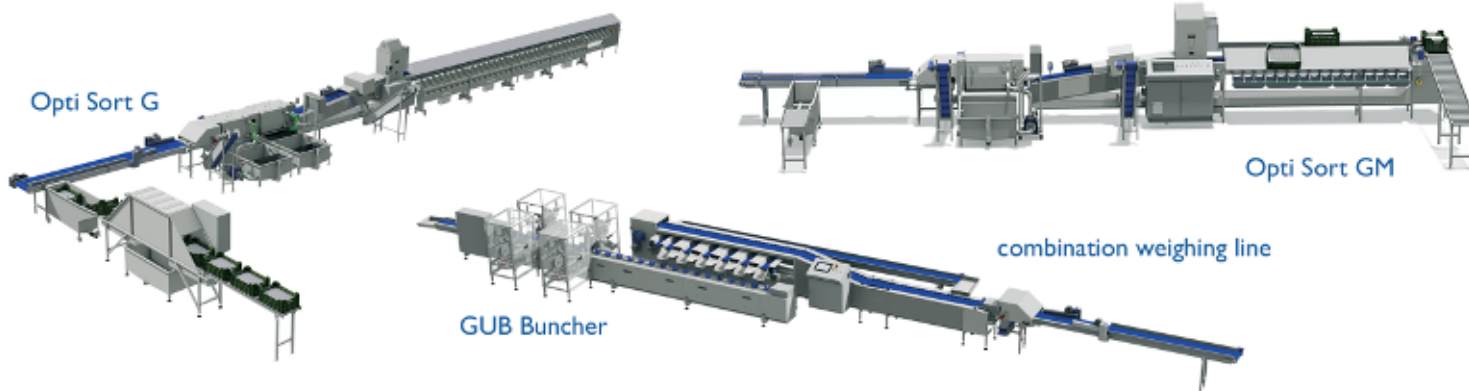


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Robots arrive **in force**

Major concerns about availability and costs of labour are driving manufacturers to offer robotic solutions. Robots use different technologies to

detect and grip asparagus. Some are already in action on the ground, others are in the pipeline.

BY GUY DUBON



Cerescon

very high-quality asparagus

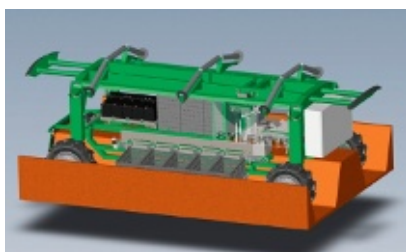
Cerescon has built an asparagus-harvesting robot. Mounted on a tracked crawler, the Sparter S121 uses a patented underground detection technique making it possible to harvest the turion before it emerges from the mound, thereby providing a very high quality of asparagus. The ten machines already being used by producers recorded more than 2,000 hours of work in 2021. They can remain in operation for 24 hours a day, offering a harvest potential of 0.3 ha/hour with a single operator (or even one operator for two machines).

Sylektis

equally suited to small and large areas

In 2022, French company Sylektis will present its automatic harvester for white asparagus: the AsperCut. With

its simple and lightweight design, this new solution is suitable for both small and large areas. The AsperCut will make it possible to harvest and crate white asparagus autonomously all along the mounds. Its compact size means it can be towed easily and quickly between different plots. With this machine, Sylektis offers a new solution to the labour shortage and enables gains in competitiveness thanks to its accessible price.



AVL Motion

harvests 9,000 turions/hour

AVL Motion's S9000 harvesting robot, presented to the public for the first time at ExpoSE, is already a very functional prototype. It recognises asparagus using a conventional optical camera and employs twelve picking modules to harvest one asparagus every 0.7 seconds. The two models currently in operation have proven capable of harvesting 11 ha per day in 16 hours of work, or 24 ha every two days with continuous work.

Strauss to outline roadmap for coming years



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Several years ago, Strauss introduced the first approach for the automatic harvesting of green asparagus, as part of a project called GARotics. In 2021, following an interlude of several years, Strauss took its asparagus harvester to the next level, developing several new concepts for subcomponents of the harvester, which are currently being tested. More details will be available after the 2022 asparagus season (late summer), when Strauss finalise its field trials and update its roadmap for the coming years.

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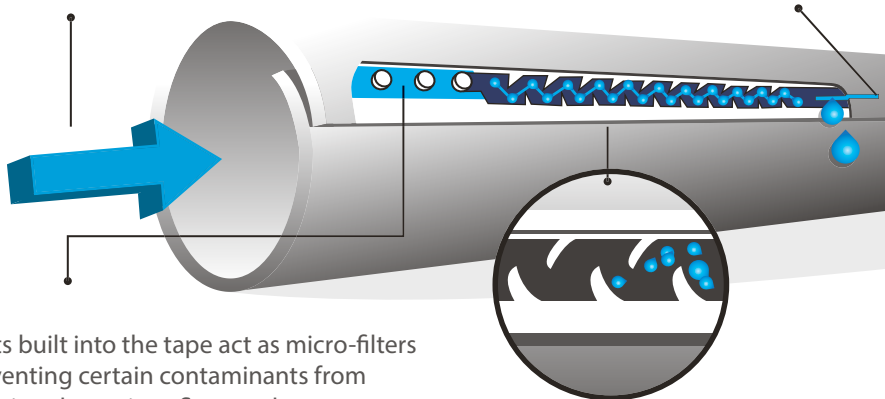
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Robot harvesters emerge for green asparagus, too

With human labour now hard to attract in many countries, or costing a lot more, asparagus growers across the globe are taking a keen interest in the development of automated harvesters for green spears.

BY JULIE BUTLER [@FreshScribe](#)

When it comes to the higher-priced white asparagus, some major Dutch growers are already learning how to use harvesting robots, such as Cerescon's Sparter, and advanced models are being trialled elsewhere on European farms as this article goes to print. But now it's the turn of green asparagus, with prototypes emerging from countries including the UK, New Zealand and Japan that aim to offer a mechanical hand with the labour-intensive job of selective asparagus harvesting.

Why robots are needed

Many industry eyes are on these developments as the stakes are high – a major asparagus grower in the UK says if green asparagus harvesting can't be automated there, *"within a few years all asparagus consumed in the UK will be imported from South America and Eastern Europe."* According to John Chinn, partner in family farm Cobrey Farms, producers of over half the asparagus grown in the UK, the issue isn't about saving the cost of harvesting labour: *"We can afford the cost of the labour but we can't get it."* While for growers in the United States, they can now get the labour but at a cost threatening their competitiveness with imports from Mexico and Peru. Under the H-2A temporary agricultural workers program, American farmers can fill employment gaps

“ Our goal is to be competitive with labour costs and mimic the cash outflows that a grower encounters when employing workers. ”

**Muddy Machines
CEO Florian Richter**

Muddy Machines is now working on a next generation, lighter, battery-powered and self-driving version of its robot harvester Sprout.



© Robotics Plus Limited

by hiring workers from other countries. But for 2022, what is effectively the minimum hourly wage set for H2A workers, as well as US workers in corresponding jobs, is \$15.37 in Michigan, while California has the highest in the nation at \$17.51 followed by Oregon and Washington at \$17.41. However, John Bakker, manager of the Michigan Asparagus Industry Research Farm,

explains that the programme is so complicated that most farmers don't directly hire pickers, they hire through contractors who charge over \$20 (≈18€) an hour, while in other parts of the world, competitors pay much less for labour.

Not just for picking

But while robots offer a solution in terms of harvesting labour, most of those in advanced stages of development are also being designed to do much more. As well as being able to tell which spears are ready to pick, AI-equipped harvesters are likely to also be able to integrate with a data platform, which could in turn serve to help predict yields and robot maintenance needs. And in future these tireless workers could also be used for other farm jobs, like weeding or picking other crops. But how will growers pay for them and can they afford them? This is something still being worked out but Robotics as a Service (RaaS) seems one likely business model while the technology is still maturing, whereby farmers don't buy or lease a robot, they pay for an integrated service, with a fixed rate per kilo of asparagus picked or area harvested, for example. Following are two promising projects in the field of automated harvesting.

Can 'Sprout' save British asparagus?

A field robot able to distinguish between green asparagus spears that are ready to be picked ➔



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As it picks spears according to grower specs, Sprout also collects data on those still emerging, helping growers more precisely predict yields.

➔ and those that are not is being developed by British agri-tech startup Muddy Machines. As it picks the spears according to a grower's specifications, automated harvester Sprout also collects data on those still emerging, allowing growers to predict yields with more precision and thus also storage and distribution needs and even market supply, a major factor in wholesale market prices. Automating asparagus picking is challenging because the spears are usually very close to one another, and weeds may be closeby. But Muddy Machines CEO Florian Richter says Sprout can distinguish asparagus spears from weeds, as well as singling out and cutting a spear very near another one. "The next step is to improve the pick speed and the effective up-time in the field," he said. The firm is now working on a next generation, battery-powered and self-driving Sprout that will also weigh less, so it doesn't harm the soil. Sprout will undergo its first commercial field operations in Britain, where there is a major farm labour shortage, during the 12-week asparagus season due to start in about mid-April, 2022. "We've already had our first commercial order. We're now targeting to be in the field next year with several machines offering harvesting as a service so they can be continually upgraded as new capabilities emerge. We're currently raising a seed financing round in order to execute that," Richter said. Sprout can work in polytunnels as well as fields, has been built to be apt for work in all UK, European, Canadian and Latin-American asparagus fields; and can weed as well as harvest. As for pricing, Richter said the firm will need to work this out carefully with the growers over the next few seasons. "Our goal is to be competitive with labour costs and mimic the cash outflows that a grower encounters when employing workers. We see the robot moving to other fields (tenderstem broccoli, beans, courgettes, etc.) after the asparagus season," he said. The firm already has a small commercial contract for 2022, with Cobrey Farms, and will be taking pre-orders for 2023 after this season, with a view to a few overseas trials while expanding operations in the UK next year.

NZ also pinning its hopes on a robot to pick green spears

A robot that harvests green asparagus is the subject of a 4-year, NZ\$5 million project that is being backed by the New Zealand government. The project builds on early prototypes developed by University of Waikato researchers in conjunction with Tauranga-based Robotics Plus Limited, trialled in the US and NZ. Now, Robotics Plus is working alongside NZ asparagus growers with the ongoing support of the university and other partners to develop a commercial-scale autonomous robotic harvester. The robot's vision system detects asparagus spears, computes their base location, and, if tall enough to harvest, uses a robotic arm to cut the spear as the robot passes over. Technology for gathering yield data and potential add-ons for packing and weeding could also be developed. It's hoped the harvester will help address ongoing farm labour shortages and aid NZ asparagus growers – who mostly supply the domestic market – in tapping into high-value export markets. The harvest could thus be a game-changer for the asparagus industry, where half the cost of producing asparagus is labour. The NZ government is providing \$2.6 million from its Sustainable Food and Fibre Futures fund for the project, which started in August. Robotics Plus says green asparagus is conducive to automation as it grows above ground and replaces a physically arduous seasonal job. Robotics Plus CEO Steve Saunders: "The early prototypes have given us great insights for a next-generation commercial-scale asparagus harvester. We completed planned work streams during the pre-Christmas harvest, and we're now moving into a 12-month program, with a heavy grower focus, to really understand their requirements – this will ensure we deliver a usable machine with the right ROI." NZ Agriculture Minister Damien O'Connor said the harvesting robot could operate at any time of the day "and utilise sensory data to determine the best harvesting strategies based on environmental conditions and growth patterns." *AW*

Christiaens

green asparagus harvesting machine

Christiaens Agro systems presented a new towed green asparagus harvesting machine. Based, as for white asparagus, on the concept of total harvest, all asparagus is cut by a specially designed band saw. After cutting, the asparagus is carried by conveyor belt to a sorting table. The machine requires two "Machine Operators" and a driver and can harvest about 2hectares per hour. It is also equipped with a mechanical weeding module placed at the back to maintain the bed.



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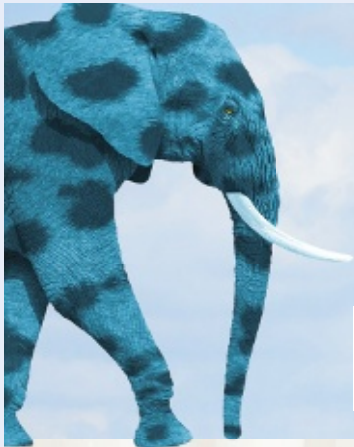
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Growing white asparagus in containers to diversify greenhouses

In Belgium, the need for some greenhouse vegetable producers to switch crops is leading them to research how to cultivate white asparagus. To support them, the Inagro cooperative has set up a demonstration asparagus plantation, using both mounds and containers.

BY BENOIT DELABRE AND ALETHEIA PRESS

Adding value to tomato or salad greenhouses by planting an asparagus bed is possible. This technique is gradually spreading in Belgium, especially in Flanders, as producers seek ways to convert their greenhouses from the less-profitable tomato production or switch from growing salads, following the spread of fusarium wilt. Such considerations have pushed the Inagro cooperative to set up a demonstration asparagus bed inside its greenhouses. “We don’t have soil that is very suitable for asparagus in these greenhouses,” said Ronny Versyck, head of greenhouse cultivation at Inagro. Nevertheless, the small demonstration space can provide key insights for producers wishing to get started in this area.

Soil heating

Two methods have been adopted for greenhouse asparagus production: in mounds and in containers. Both systems have their advantages and disadvantages, but container growing is spreading more widely. More ergonomic, containers also make it possible to work with soils that are a little heavier than those used for mounds. The construction of the containers is relatively simple. They involve rows of 1.6 metre piles, with crowns planted at a depth of 80 cm every 1.5 m. The



Belgian cooperative Inagro has set up a demonstration asparagus bed in a greenhouse (left in mounds, right in containers).

edges of the containers are made from an anti-root membrane. They must be buried at least 15 cm deep to leave enough depth available to the plants’ root system. The width of the containers is usually 80 cm. This makes it possible to plant two rows of crowns. But it is also possible to use 110 cm containers, which can accommodate a third row, although this is less recommended. In this case, “The inner row has a lower yield and the asparagus is also of a smaller size,” Versyck said. This row probably doesn’t get enough light due to the plants’ growth and competition with the other two rows. Once the container is built, and before filling, a soil heating system must be installed. A simple hot water network is fine, but the temperature must be well controlled. After the necessary cold transition around the third week of January, water at a temperature of 30–35°C is circulated in the containers. After two to three weeks, the deep soil temperature should reach 28°C, compared with 18–20°C on the surface.

Mounds, a less costly alternative

Many greenhouse asparagus growers choose to use containers, but mounds also have their advantages. While they bring a lower yield, they are less expensive. Above all, they make the mechanisation of certain tasks possible, particularly in the re-mounding (re-making of the mounds) and the destruction of the vegetation before winter. Also, their use avoids the need to regularly add substrate, a laborious task that is specific to growing in containers. On the other hand, the planting density is a little lower (maximum 60,000 seedlings/ha against 65,000 seedlings/ha). But, most importantly, it is soil quality that is essential to the success of the crop. The soil should be loose, light and well drained, and it must be up to 1 m deep to ensure proper root development. The soil warming system is buried 5–6 cm below the crown planting level. Then, mounds that are 20 cm high and 35 cm wide are made using the earth between the rows.



In mounds, the crowns are deposited about 20 cm deep, but at least 5 cm above the soil warming system.

A light and humus-rich substrate

The crowns are then placed on the ground and the roots spread out. At Inagro, they have opted to space the plants in the 80 cm containers 15 cm apart, with an inter-row of 50 cm. Such a planting density makes it possible to reach 65,000 plants per hectare in bins (against 60,000 plants in mounds), which is at least twice as much as is possible in open-air cultivation. While Inagro chose the Fortems variety, it is the Backlim variety that seems to be by far the most popular among growers. The container is then filled with the lightest possible soil, to facilitate the growth of straight asparagus. The initial filling comes from the earth located between the containers and consists of about twenty centimetres in depth. Then, about twenty centimetres of a filling substrate must be added. This substrate must also be particularly light and airy in order to facilitate a straight shoot. This substrate can consist of compost, mushroom compost (champost)



© Inagro

or even coconut fibres or strawberry peat. The containers are then replenished, every year or two, as the substrate is consumed and the crowns rise. The important thing is of course to keep the asparagus away from light in order to ensure it stays white and prevent branching. For irrigation that limits the risk of foliage disease, a drip-feed system is recommended. This system also minimises water consumption. One irrigation tube per row is proving to be the most effective

Growing in containers brings a higher yield. Although more ergonomic for harvesting, it nevertheless requires the laborious regular replenishment of substrate.

method. "You have to bring a lot of water, especially in August," Versyck said.

Full harvest in third year

At Inagro, the crowns planted in mid-March developed their first shoots only 8 days after planting. Vegetation normally develops before cutting in November. The containers are then covered to ensure perfect filtering of light. The harvest can start in March. "We harvest eight weeks before Easter, or three weeks before the start of soil warming," Versyck said. "We could harvest as early as the end of December with a good warming of the soil. But there is no market for that." The first harvest is usually very small and is spread over only three weeks. This pushes some growers to omit the early warming of the soil at the end of the first winter. A full-yield harvest spread over eight weeks is expected from the third year, and the asparagus bed will function at full capacity until about the seventh year. As with traditionally grown crops, greenhouse asparagus cannot be kept productive for more than ten years, due to the progressive contamination of the soil by *Fusarium oxysporum* f. sp. *Asparagi*. **AW**

© Inagro



Before harvest, the containers (or mounds) are carefully covered to protect the asparagus from light.

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BY ISABELLE KOKULA

Vorgestellt wurden innovative Anbaumethoden, aktuelle Ergebnisse aus der angewandten Forschung im Spargelanbau, ein neu entwickeltes Qualitäts- und Erntemengenmanagement-System sowie Grundlagen und Empfehlungen rund um den Nährstoff Phosphor. Der Spargeltag Karlsruhe wird organisiert vom Landratsamt Karlsruhe gemeinsam mit dem Regierungspräsidium Karlsruhe und dem Verband Süddeutscher Erdbeer- und Spargelanbauer. Gerrit Kleemann, Leiter des Landwirtschaftsamtes Bruchsal begrüßte das interessierte Publikum, durch das Programm führten Angelika Appel und Isabelle Kokula. *Av*



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<https://karlsruhe.landwirtschaft-bw.de/pb/Lde/Startseite/Fachinformationen/Spargelanbau>



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„Der durch die Bodenverlagerung aus der Gasse auf den erhöhten Damm das Volumen an fruchtbarer Erde für das Spargelrhizom wesentlich vergrößert wird, wodurch sich für die Pflanze die Versorgung mit Feuchtigkeit, Nährstoffe und Sauerstoff verbessert,“ gibt an Christian Befve

Christian Befve

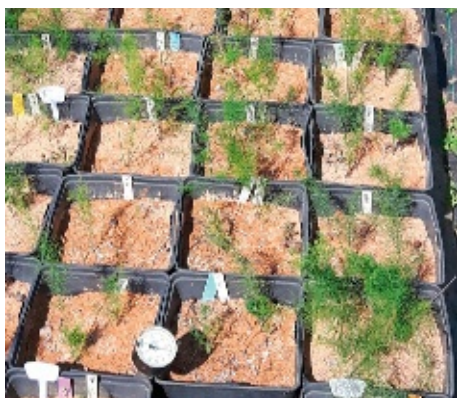
Spargelanbau auf erhöhten Dämmen, unter diesem Titel stellte der internationale Spargelberater **Christian Befve** seine innovative Methode vor, bei der durch die Bodenverlagerung aus der Gasse auf den erhöhten Damm das Volumen an fruchtbarer Erde für das Spargelrhizom wesentlich vergrößert wird, wodurch sich für die Pflanze die Versorgung mit Feuchtigkeit, Nährstoffe und Sauerstoff verbessert (AWn°3 2021). Neben der früheren Erwärmung ist eine Ertragssteigerung zu beobachten, eine erhöhte Wirtschaftlichkeit durch die Einsparung von Laufmeter (Erntegassen) und es kann eine dauerhaft Begrünung im vertieften Bereich der Gasse eingesät werden. Der Vortrag in französischer Sprache wurde von Simon Kokula übersetzt.

Dr. Carmen Feller

Freilandversuche zum Spargelanbau am IGZ Großbeeren stellte **Dr. Carmen Feller**, Wissenschaftlerin am Leibniz-Institut vor. Sie zeigte auf, dass sich in Gefäßversuchen eine Verbesserung des Wachstum durch eine Dämpfung des Bodens feststellen ließ, hingegen keine signifikante Verbesserung durch die Verwendung von Additiven (Champost, Kompost, Promot*Plus, Rhizovital). Anders jedoch im Feldversuch mit den Additiven Champost, Tonminerale, Senfmehl und Micosat. Hier konnte sowohl durch die Zugabe von Senfmehl als auch durch das italienische Produkt Micosat eine signifikante Steigerung des Ertrags erfasst werden, positive Tendenzen waren für Champost erkennbar. Eine Untersuchung des Bodenlebens unter Folienabdeckung zur Erfassung der biologischen Aktivität und der Biodiversität in Spargeldämmen in Abhängigkeit von der Bedeckung ergab, dass durch die Folienauflage weder das Bodenleben noch die Bodenfruchtbarkeit verschlechtert wurden.

Joachim Ziegler

Aktuelle Ergebnisse aus Spargelversuchen und Projekten am DLR-Standort Queckbrunnerhof stellte **Joachim Ziegler**, Abteilungsleiter Gartenbau am DLR Rheinpfalz vor. Mit dem neu entwickelten Projekt webQE wurde hier ein Qualitäts- und Erntemengenmanagement im Spargelanbau entwickelt, um durch die schlagspezifische Vorhersage der Erntemengen die Betriebsleitung bei ihren täglichen Entscheidungen zu unterstützen. Zudem wurden erste Ergebnisse aus einem neuen Versuch mit Frühsorten vorgestellt (Pflanzung 2016) und über ein aktuell laufendes Grünspargel-Nachbau Projekt auf Lehmboden berichtet.



Dr. Ludger Aldenhoff

Phosphor – ein wichtiger Nährstoff und seine Optimierung im Spargelanbau, zu diesem Thema referierte **Dr. Ludger Aldenhoff**, Spargelberater des Beratungsdienstes BDSE. Auf der Grundlage eigener Versuche und Beobachtungen im Rahmen der Beratung, stellte er die möglichen Folgen von Über- oder Unterversorgung des Nährstoffes Phosphor für die Spargelpflanzen dar. Laut Aldenhoff wird ein Phosphor-Mangel häufig übersehen, da er optisch am Laub kaum erkennbar ist, dennoch aber zu großen Einschränkungen für das Wachstum der Pflanzen sowie zu Berostung der Stangen führt. Mit einer vergleichenden Darstellung der verfügbaren P-Dünger zeigt er deren Eignung für die unterschiedlichen Böden auf.



Robert Courth

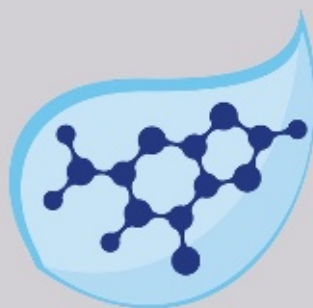
Regenerative Landwirtschaft – erste Erfahrungen im Spargelanbau. **Robert Courth**, verantwortlich für den Anbau auf dem Rafzer Spargelhof, berichtete von seinen Bemühungen neben dem Ackerbau auch den Spargelanbau auf Regenerative Landwirtschaft umzustellen. Die angestrebte erhöhte Biodiversität und eine möglichst andauernde Bodenbedeckung durch Begrünungspflanzen ist im Spargelanbau durch das Auf- und Abdämmen schwer umsetzbar. Durch eine Begrünungsaussaat möglichst direkt nach der Ernte sowie einer nochmaligen Aussaat von Winterweizen in die Gasse nach dem Erstellen des Winterdamms, nähert er sich diesen Leitlinien an. Die Düngung der Anlagen erfolgt mit einer Terra Preta, bestehend aus Pferdedung, festem Gärgut, Pflanzkohle, Gesteinsmehl, EM und Melasse.



ABSTRACT

Isabelle Kokula, LRA Karlsruhe
Spargelberatung
Landwirtschaftsamt Bruchsal,
Landkreis

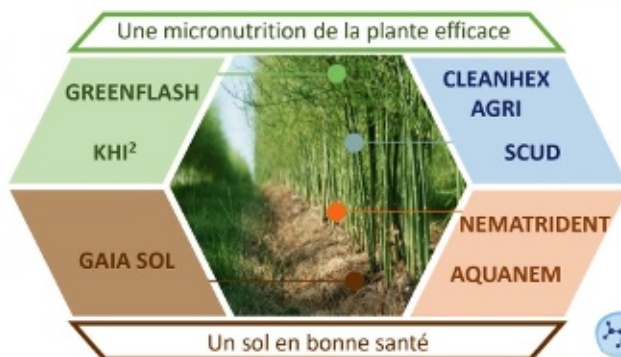
With international guests and experienced experts, the 32nd Karlsruhe Asparagus Day on November 17th, 2021, held in conjunction with the international asparagus and strawberry fair ExpoSE, welcomed its numerous guests in the large conference hall of the Forchheim exhibition centre. Innovative cultivation methods, recent results from applied research in asparagus cultivation, a newly developed quality and harvest quantity management system, as well as basic principles and recommendations for the nutrient phosphorus were presented.



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Tackling the **asparagus beetle**

Asparagus beetles are one of the most damaging pests. In France, the Criotrap project piloted by Invenio is trialling the use of volatile organic compounds (VOCs) to reduce populations.

BY GUY DUBON

The *Crioceris asparagi* beetle has become the biggest pest for the aerial parts of asparagus plants, especially in the south of France, but also in Spain and Germany. French asparagus producers have found themselves helpless in the fight against the asparagus beetle since the ban on neonicotinoids at the end of 2018. The two most effective active ingredients against this pest, acetamipride and thiaclopride, can no longer be used in France. The only alternative is pyrethroids, whose use can lead to the appearance of resistance and lower effectiveness, leading to an increase in the number of treatments required. Before the prohibition of neonicotinoids, the beetles' larval stage was commonly considered the most damaging time in the asparagus field. But the summer of 2019 proved that as soon as the adults arrive, the damage observed is also very significant.

Identifying the “olfactory bouquet” of asparagus

Attacks by asparagus beetles can halve the vegetative volume of infested fields and reduce yields in the following year by 2-3 tons a hectare (30-50%). The adults and larvae feed by gnawing at the various green tissues of the asparagus, leaving deep pale-yellow traces. In the Landes area of France, the Invenio station is now seeking alternatives to neon-



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As soon as the adults arrive, the damage observed is very significant.

Attacks can halve the vegetative volume of infested fields and impact on future yields.

icotinoids in the fight against the asparagus beetle. The Criotrap project started in June 2021 and focuses on managing asparagus beetle populations in environmentally friendly ways. “Humans live in a visual world, but other living beings, including crop pests, live in the world of odours,” said Ené Leppik, creator of Agriodor, a company that offers solutions based on kairomones. At a conference dedicated to odours and pests, the specialist clarified the difference between the actions of pheromones (which act on individuals of the same species) and those of kairomones and synomones (which act on different species, including of plants and pests). The Criotrap project is based on these relationships. “Part of our work tries to identify the ‘olfactory bouquet’ of asparagus, which is 90% composed of the same molecule, to attract or divert adults during the spring migration from their wintering area (forests) to asparagus plots,” said Romain Warney, asparagus expert at Invenio. A trapping device set up by Invenio in partnership with the Agriodor laboratory is based on the use of volatile organic compounds (VOCs) produced either by asparagus or by asparagus beetles. Work began this summer, with the identification of the VOC bouquet produced by asparagus. “The next step is to determine whether any of these VOCs are attractive to the beetle. The underlying objective is to use the VOCs identified as being attractive in a trap to reduce populations and bring their numbers to acceptable thresholds,” said the specialist. Observation of adults has also demonstrated this insect’s use of aggregation pheromones, which could also serve as a means of trapping them. **AW**

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Oxybiotop, présente un traitement préventif contre le criocère de l'asperge

SILISTIM

Dans la lutte contre le criocère de l'asperge, Oxybiotop propose **Silistim** à base de macérations de plantes insectifuges, classées comme « matières de base », ce qui le rend éligible en AB. **Silistim** repousse les insectes avant qu'ils ne pondent leurs œufs et empêche également leur développement. Le savon noir très visqueux est à ajouter à raison de 4 % dans **Silistim** engluant les larves et a un effet répulsif.



CRÉDIT PHOTO : TOMASZ/ADOBE STOCK

PROTÉGEZ l'asperge dès la fin de récolte

UTILISEZ à la dose de 10 l pour 100 l

APPLIQUEZ sur tout le feuillage

RENOUVELEZ tous les 15 jours

Témoignage

Léo Denet, chef de culture Planasa France

De par la proximité de la forêt de pins maritimes, nous subissons une très forte pression sanitaire du criocère. Les asperges vertes sont attaquées dès mars-début avril. Mais les dégâts les plus importants se font sur l'asperge blanche dès la fin de récolte et l'enlèvement des plastiques. En 2021, nous avons utilisé Silistim très tôt afin de retarder au maximum l'arrivée des criocères adultes dans les parcelles en répétant une application de Silistim toutes les semaines. Le cycle du ravageur est perturbé mais celui-ci arrive toutefois à s'implanter. Lorsque la pression devient trop importante nous intervenons avec un insecticide. Selon l'efficacité du traitement et la bonne maîtrise des insectes, larves et adultes, il est de nouveau possible de réutiliser Silistim pour limiter de nouvelles introductions d'adultes dans les parcelles.



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Biostimulants and their impact on the productivity and quality of asparagus

By increasing root exudation, biostimulants promotes rhizosphere colonization by native microbiota and a exogenous beneficial microbial consortium resulting in improved microbial population and biodiversity as well as nutrient availability and root development.

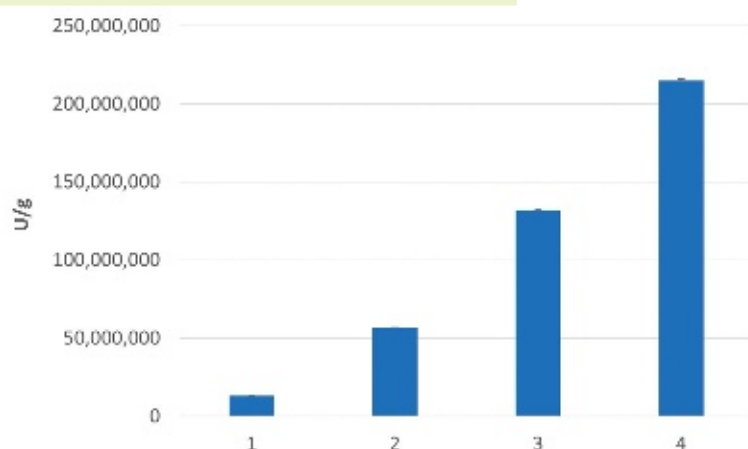
BY ALI ASAFF^{1,2}, FRANCISCO DE LA TORRE¹, JAVIER ZUZUNAGA^{1,3}, DOMINIQUE RUGGLI¹

Over thousands of years of evolution, plants have found beneficial allies in soil microorganisms to enhance the different processes occurring at the root level. For example, root development is benefited by the production of phytohormones such as indole acetic acid, which is synthesised by several species from the *Azospirillum*, *Azotobacter* and *Bacillus* genera. Other plant-growth-promoting bacteria (PGPB), belonging to the *Alcaligenes*, *Klebsiella*, *Pseudomonas*, and *Serratia* genera, can increase seed germination rate, root growth, leaf area, chlorophyll content, nutrient uptake, tolerance to abiotic stress, delayed senescence, and yield⁽⁰⁾.

Beneficial functions of microorganisms

While some nutrients, like phosphorus and potassium, are not usually bioavailable, certain bacte-

Fig. 1. Total bacteria populations from asparagus rhizosphere, estimated by qPCR analysis. 1 and 2 correspond to composed samples from the control group; 3 and 4 to composed samples from the group treated with biostimulants.



© D. Ruggli

Microbial populations improved nutrient availability, root development and activity that promoted vigorous plants storing enough reserve materials to support good crop yields.

ria (e.g. *Bacillus* sp.) and fungi (e.g. *Penicillium* sp.) can provide them by producing organic acids and/or enzymes. Endomycorrhizal fungi are particularly effective at mobilising phosphorous, as well as at improving water uptake, tolerance to abiotic and biotic stress and physical soil structure by promoting soil aggregation⁽⁰⁾. For crops to be able to benefit from soil microorganisms, there are two specific factors that should be enhanced through agricultural practices: the total amount of beneficial microorganisms (fungi and bacteria) and the composition of these communities (biodiver-

EXPERTS

Ali Asaff^{1,2}, Francisco De la Torre¹, Javier Zuzunaga^{1,3}, Dominique Ruggli¹

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sity). Several reports show that soils, containing high and varied fungi and bacteria populations, promote tolerance to abiotic and biotic stress. In addition, large populations of beneficial microorganisms – including antagonistic (by antibiosis and/or parasitism) ones – leave little space or nutrients for the development of disease-causing agents, thus acting as biological barriers.

Root exudates increase microorganism populations

In order to benefit from the services of microorganisms, plants attract and feed them by releasing molecules of diverse chemical nature (photosynthates) into the soil via a process known as exudation or rhizodeposition. The exudation process promotes a concentration gradient and, therefore, a large increase in the microorganism populations in the soil surrounding the root zone, known as the rhizosphere⁽²⁾. Exudation occurs mostly through the root tips (meristematic zone) since the released molecules can be carried out via apoplast and symplast pathways. The flow of molecules through the plasma membrane of plant cells can occur by simple diffusion or by active transport, which requires the participation of certain types of proteins, such as ATPases⁽³⁾.

Due to the key role played by exudates in the interaction of plants with beneficial soil microorganisms, it is highly desirable to employ biostimulants that enhance exudation. Some manufacturers state that their biostimulants containing aromatic compounds (Polyphenols and flavonoids) promote the overexpression of genes related to root formation (endogenous synthesis of auxins and their transporters) and the active transport of molecules (ATPase), as well as root longevity by delaying senescence through antioxidant production, resulting in enhanced root exudate production.

Asparagus microbiota and its modulation using biostimulants

Molecular biology techniques (qPCR and metagenomics analyses) were employed to measure the effect on bacteria populations and their biodiversity of using two biostimulants (microbial and biochemical) to treat an asparagus crop (*Asparagus officinalis*), variety Darlise. Figure 1 shows the results of the total bacterial populations in two samples (7 plants each) from the control group and in two samples (7 plants each) from the treated group. As the figure clearly shows, in the treated group, the average size of bacterial populations increased by 580% in relation to the average of the control group. However, no differences were observed between the fungal populations (data not shown) of the treated and the control groups. The rise in the bacterial population and the lack of impact on the fungi population could be explained by the physicochemical

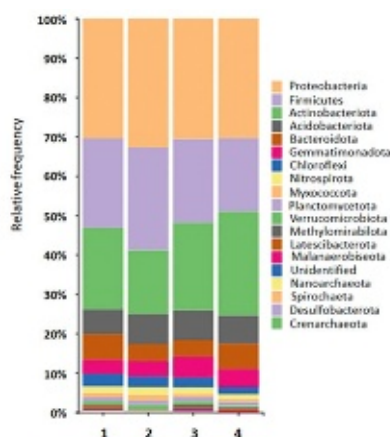


>22–32mm and >16–22mm were increased, 75% and 9% respectively, against a marked decrease in calibers 12–16mm and <12mm.

characteristics of the soil. On the one hand, sandy soils, which are not usually compact and are well-drained, allow adequate aeration, which helps bacterial growth. In addition, a neutral pH (7.1), also favours bacterial development, rather than the development of fungi, with the latter generally preferring acidic soils. On the other hand, the metagenomic analyses showed changes in the composition of bacterial (Fig. 2) and fungal (data not shown) populations, with an increase in the number of species registered for the treated group compared to the control group. This increase is measured quantitatively via biodiversity indices such as the Shannon diversity index, which indicated that the average level of the bacterial control group was 9.60, while that of the treated

group was 10.11, representing an increase of 5.3%. The average for the fungal control group was 6.77, while that of the treated group was 7.06, representing an increase of 4.3%. These results show that more active roots produce a greater amount of exudates, thereby amplifying the soil's native microorganism populations. Furthermore, the large increase in the total bacterial population of the treated group (Fig. 1), boosted by the phylum Firmicutes (Fig. 2) (to which *Bacillus* genus belongs), also indicates an increase in their populations, thus demonstrating effective colonisation of the rhizospheric zone by ➔

Fig. 2. Composition at the phylum level of the asparagus rhizosphere associated bacteria populations. 1 and 2 correspond to composed samples from the control group; 3 and 4 to composed samples from the biostimulants' treated group.



References

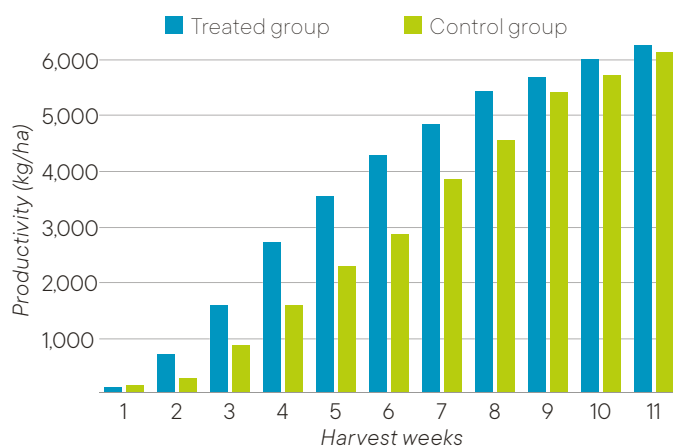
- 1 Pirttilä, A. M., Mohammad Parast Tabas, H., Baruah, N., & Koskimäki, J. J. (2021). *Biofertilizers and biocontrol agents for agriculture: How to identify and develop new potent microbial strains and traits*. *Microorganisms*, 9, 817. doi:10.3390/microorganisms9040817.
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➔ the *Bacillus* genus bacteria contained in the applied microbial consortium. A similar situation was observed in the populations belonging to the Proteobacteria phylum, which includes nitrogen-fixing or phosphorus-solubilising bacteria. Similarly, there was an increase registered in the percentage of bacteria belonging to the Actinobacteriota phylum, which includes the so-called actinomycetes, well known for their antagonistic effect against several disease-causing agents.

Impact of biostimulant on asparagus productivity and quality

The accumulated productivity over 11 weeks is shown in Figure 3. At the end of the period, there were no differences found in the total produced kilograms between the treatment and the control groups. However, during the first 8 weeks, early

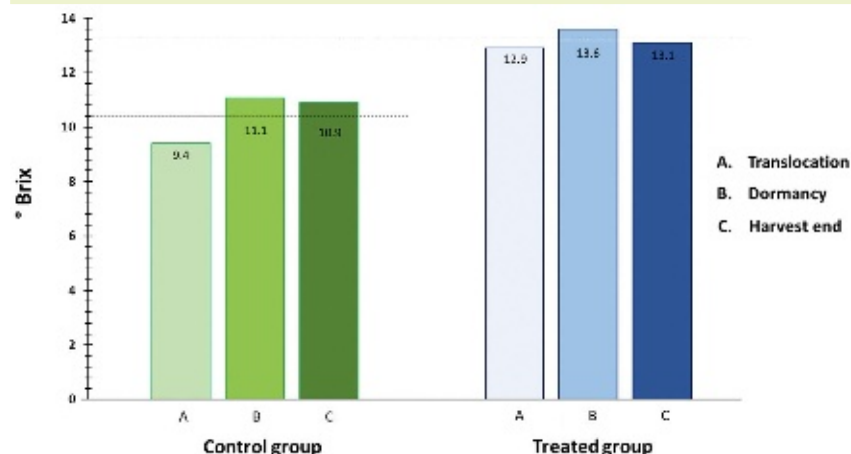
Fig. 3. Cumulative asparagus shoots production of the 2019–2020 agricultural cycle.



production was observed in the treated group. After 5 weeks of the 2019–2020 agricultural cycle, production levels were at least 17.4% higher in the treated group than in the control group. After the same period during the 2020–2021 agricultural cycle, a similar trend was observed, with an 8.3% higher production in the treated group. Moreover, significant differences were also observed in terms of the quality of shoots. In the treated group, calibres C2 (>22–32mm) and C3 (>16–22mm) increased by 75% and 9% respectively, while there was a marked decrease in calibres C4 (12–16mm) and

C5 (<12mm) (52% and 83% respectively), in relation to the control group. It should be noted that the C4 calibre is of low commercial value and the C5 has no commercial value. Other trials currently being carried out in Germany are showing similar patterns. The earlier production and improved shoot quality observed could be explained by the greater reserves of photosynthates accumulating in the roots, as measured in Brix degree (Fig. 4). The analyses carried out during translocation, dormancy, and end-of-harvest stages found that Brix degrees in the treated groups were higher than controls. For instance, at harvest end, it was 13.1 in the treated group, which was 37% higher than in the control showing that accumulation of reserve material was not only greater but also sustained over time. In addition, there was lower nitrate concentration in the soils of the treatment group compared to the control group (280 ppm/L and 440 ppm/L, respectively) and a slight decrease in soil pH of the treatment group in relation to the control group (6.9 vs 7.1, respectively). This difference might be explained by the roots releasing greater quantities of acidic compounds (usually present in the exudates). Both of these findings show that there was enhanced root activity and root architecture in the treated group (Fig. 5), with the plants able to absorb and use nutrients more efficiently, as well as interact more effectively with rhizospheric microorganisms. *AW*

Fig. 4. Degrees Brix (°Bx) accumulation in asparagus roots. Green corresponds to the control group, Blue to the treated group.



Conclusions

The results of field trials carried out during the 2019–2020 and 2020–2021 agricultural cycles in the Aquitaine region (Le Barp) of France show that the employed biostimulants promoted greater root exudation and activity, thus ensuring rhizosphere colonisation by the beneficial microorganism consortium (containing *Bacillus*, *Azospirillum*, *Trichoderma* and *Penicillium* strains) while also stimulating the interactions of the native microbiota roots. As a result, there was an increase in microbial populations and in their biodiversity, which improved nutrient availability, as well as root development and activity. Hence, there was a virtuous circle whereby the more vigorous plants stored enough reserve materials to generate good crop yields and meet quality requirements. These biostimulants can provide two benefits for farmers:

- 1) Earlier crops can allow access to markets for higher volumes when prices are high; and
- 2) The production of larger calibres offers crops of higher commercial value.

Fig. 5. Root architecture in the treated group and in the control group.



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Six étapes pour **comprendre** **le cycle glucidique** de l'asperge

La production des turions se fait sur les réserves accumulées dans les racines l'an précédent. Comprendre la physiologie de l'asperge et notamment son cycle glucidique permet d'appréhender une grande partie des secrets de sa culture.

PAR GUY DUBON

L'asperge est une plante pérenne à la physiologie très complexe. Bien qu'étroitement liées la partie racinaire et la partie aérienne ont un fonctionnement très spécifique. La partie racinaire est constituée de plusieurs racines charnues reliées à un réseau de tiges souterraines : le rhizome (Tiejdens, 1924). Les racines charnues correspondent à des organes de réserve. Ces racines n'assimilent pas les éléments hydriques et nutritifs nécessaires au développement de la plante. Cette fonction étant assurée par les racelles situées à leur surface. Les racines de stockage vivent entre 3 et 6 ans (Scott, 1954). Les racelles sont renouvelées annuellement (Reijmerink, 1973). Des bourgeons desquels émergeront les futurs turions se trouvent à l'extrémité des tiges formant le rhizome. Ils sont regroupés en « cluster » (Hughes, 1992). Chaque bourgeon peut produire un turion. Globalement la masse racinaire augmente lors des premières années,



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Les racines charnues correspondent à des organes de réserve. L'assimilation des éléments hydriques et nutritifs nécessaires au développement de la plante est assurée par les racelles situées à leur surface.

ABSTRACT

Physiology

Six steps to understanding the carbohydrate cycle in asparagus

Turion production draws on the reserves accumulated in the roots from the previous year. Understanding the physiology of asparagus and its carbohydrate cycle unveils many of the secrets to its cultivation. The cycle is divided into six stages. During the harvesting of turions in the spring and at the beginning of the vegetative phase, the plant draws on its carbohydrate reserves (phase 1: mobilisation of reserves and phase 2: establishment of the shoot). After the formation of the first cladodes, photosynthesis starts to take place. The weight of the aerial part increases by 15% per week before reaching its maximum. At this point, carbohydrate storage occurs (phase 3: storing of reserves). When the photoperiod is less than 14 hours, the assimilates are directed primarily to the crown. The crown then becomes the main "well" organ that recovers 90% of the synthesised sugar (phase 4: pre-senescence). Senescence is initiated when the plant is subjected to low temperatures (between 10°C and 15°C). The weight of the aerial part decreases by 15% per week, while there is an 8% per week increase in the weight of the root part (phase 5: senescence). In temperate regions, when temperatures drop and in the autumn photoperiod, the stems wilt and the plant becomes dormant. This state of low metabolic activity allows the plant to adapt to the winter climatic conditions (phase 6: dormancy).

puis se stabilise au bout de cinq années, ce qui correspond au renouvellement des racines de stockage (Hughes, 1992). (fig 1)

Le rendement dépend de la quantité de glucides accumulés

Le cycle phénologique de l'asperge débute au moment de la récolte. En période de pleine production (aspergeraie de 3 à 10 ans), les producteurs récoltent pendant environ 10 semaines. A l'arrêt de la récolte, débute la phase végétative. Les turions vont successivement atteindre dif-

TABLEAU 1: RÉPARTITION DES GLUCIDES LORS DE LA PHASE DE MOBILISATION DES RÉSERVES (SOURCE : WILSON, ET AL., 2005)

Taille du système racinaire (poids sec en T /ha)	6-10 T/ha	11-15 T/ha	16-20 T/ha
Turions	52%	41%	28%
Bourgeons et racines	12%	16%	19%
Utilisation pour la 1 ^{ère} pousse	16%	18%	22%
Glucides non disponibles	20%	25%	31%

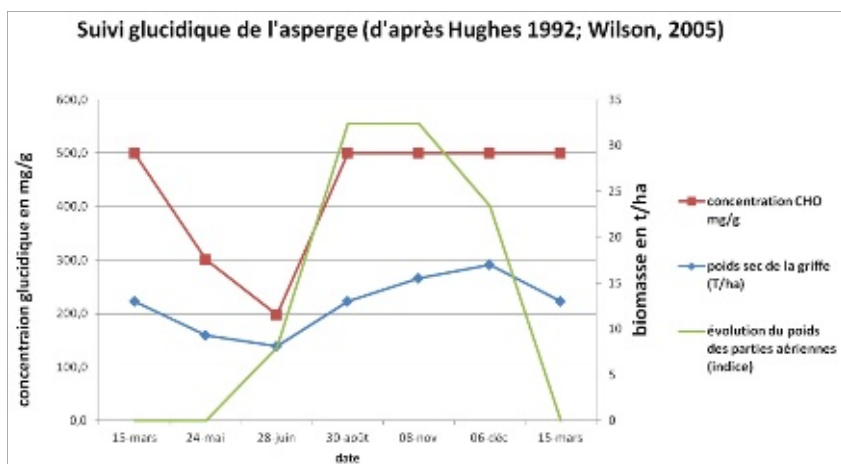


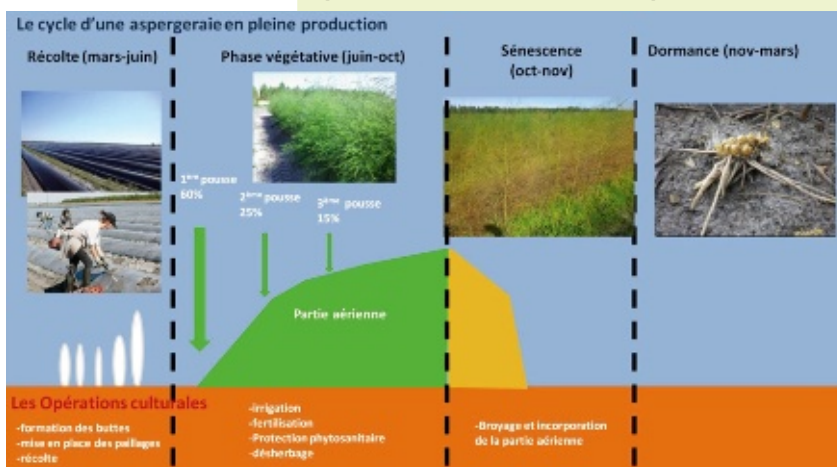
Figure 3 : évolution de la teneur en glucides dans les racines d'asperges (d'après : Hughes, 1992; Wilson, et al., 2005). La baisse de concentration des glucides (CHO) dans la griffe correspond à la période de récolte (en rouge), cette concentration et le poids de la griffe (en bleu) augmentent de nouveau avec le développement de la végétation (en vert).

férents stades phénologiques jusqu'à la maturation des baies et la sénescence (Feller, et al., 2011). Lorsque les premières tiges sont matures, une nouvelle vague de turions arrive. On parle de la première, deuxième et troisième pousses qui représentent respectivement 60%, 25% et 15% de la masse végétative (ATIA, 2013). La phase végétative s'étend de juin à octobre et se termine avec la sénescence du feuillage. La phase de dormance a lieu pendant la période hivernale (sous les climats tempérés). La plante est en repos végétatif jusqu'à l'augmentation de la température du sol et l'émergence des premiers turions lors du printemps suivant (Fig 2). Durant la phase végétative, des mécanismes physiologiques particuliers interviennent pour la constitution de réserves glucidiques. Ces dernières sont stockées dans les racines de stockage sous forme de fructane et sont mobilisées l'année suivante lors

du développement des parties aériennes. Le rendement d'une année dépend alors de la quantité de réserves glucidiques accumulées lors du cycle végétatif précédent (Pressman, et al., 1993) (fig 3). Connaître le cycle glucide de l'asperge est de la plus haute importance pour optimiser une plantation. Le comprendre, c'est comprendre une grande partie des secrets de l'asperge. **AW**

Sources Invenio - Augustin Drouet Mémoire de Fin d'Études d'Ingénieur Agrocampus Ouest

Figure 2 : Le cycle d'une aspergeraie en production débute au moment de la récolte et se termine avec la période de dormance, avant de repartir de nouveau.



Source: A. Drouet

Les glucides accumulés vont à plus de 40% vers les turions.



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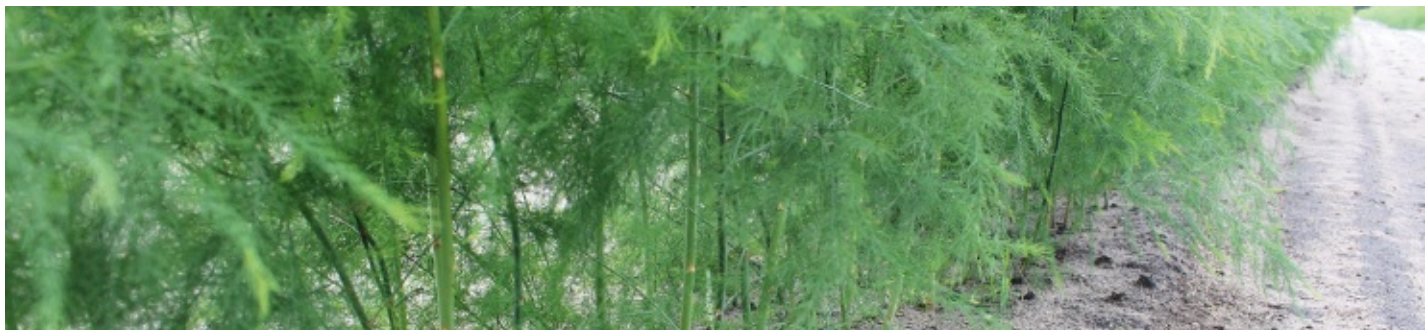
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Le cycle glucidique en 6 étapes



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1) La phase de mobilisation des réserves

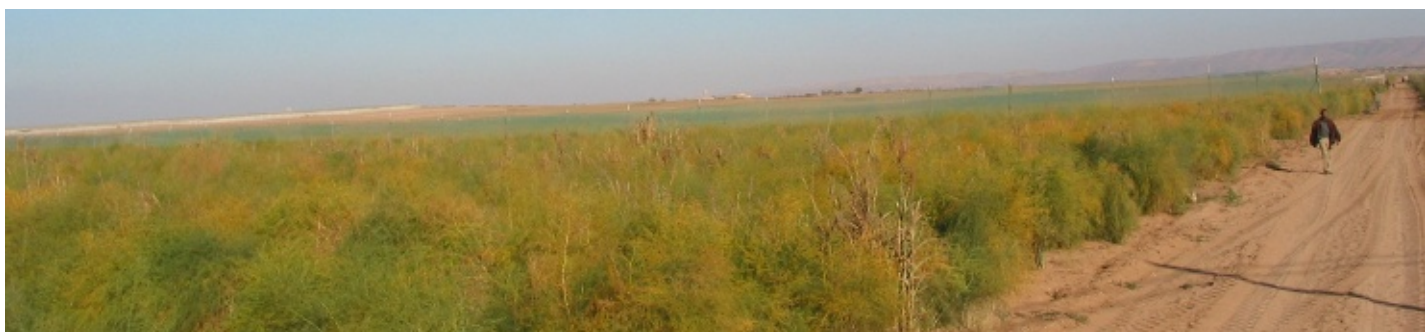
Cette période correspond à la récolte et la mise en place de la partie aérienne. La récolte dure 8 à 10 semaines dans les régions tempérées, la récolte commence au début du printemps. La plante va puiser dans ses réserves glucidiques afin de permettre aux turions de se développer. La concentration glucidique et le poids des racines vont diminuer.

2) L'établissement de la première pousse

Cette étape marque le début de la phase végétative (4 semaines). Une partie des réserves de la plante est consommée lors de l'établissement de la première pousse et la mise en place des cladodes (Shelton, et al., 1980). On estime à 4 semaines le temps nécessaire avant que la première pousse n'exporte des photoassimilats vers les griffes. Durant cette phase, le poids et la concentration en glucides des racines diminuent (Guo, 2001; Hughes, 1992). Durant la phase de mobilisation des réserves, les glucides suivent une répartition qui dépend de la taille du système racinaire (Wilson, et al., 2005). On note que les glucides vont à plus de 40% vers les turions pour des systèmes racinaires allant de 10 à 15 tonnes/hectares. Pour ces derniers, le pourcentage de glucides destiné à la première pousse n'excède pas les 20%. La répartition des glucides est plus homogène sur des aspergères ayant des systèmes racinaires développés.

3) La phase de restauration des réserves

Peu après la formation des premiers cladodes, la photosynthèse devient effective (8 à 10 semaines). Ce processus va permettre l'assimilation du carbone atmosphérique sous forme de saccharose (Pressman, et al., 1993). Ce dernier est exporté des cladodes vers les autres organes via le phloème. Le saccharose excédentaire est polymérisé sous forme de fructane en vue d'un stockage à long terme (Nichols, 1996). La mise en réserve glucidique devient effective. Durant cette phase, les assimilats sont répartis entre développement de la partie aérienne et constitution des réserves (Hughes, 1992). Ainsi, le poids de la partie aérienne augmente de 15% par semaine et atteint un maximum. En parallèle, la concentration glucidique de la griffe atteint une limite physiologique : les réserves sont pleines (Haynes, 1987). Dès lors, on note une croissance des racines. La taille du réservoir glucidique augmente.



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4) La phase de présénescence

On estime que lorsque la photopériode est inférieure à 14 heures, les assimilats sont dirigés en priorité vers la griffe (Faville, et al., 1999). Ce changement de répartition est contrôlé par l'acide abscissique (ABA). L'ABA stimule la mise en réserve et inhibe le développement de nouveaux bourgeons (Ku, 2006). 90% du sucre synthétisé serait alors exporté vers les organes de stockage (Wilson, et al., 2000). Le développement de la partie aérienne est limité et la griffe devient alors l'organe « puits » principal. Durant la phase de restauration et de présénescence, la majorité des réserves sont constituées (Guo, 2001).

5) La sénescence

La sénescence est amorcée lorsque la plante est soumise à des températures faibles (entre 10°C et 15°C). On observe que le poids de la partie aérienne diminue fortement au profit du poids des griffes. En effet, le poids des parties aériennes diminue de 15% par semaine contre une augmentation du poids de la partie racinaire de 8% par semaine (Hughes, 1992).

6) La dormance

Dans les régions tempérées, avec la diminution des températures et de la photopériode en automne, les tiges fanent et la plante entre en dormance. Cet état de faible activité métabolique lui permet de s'adapter aux conditions climatiques de l'hiver. Enfin, afin de maintenir ses fonctions vitales, une partie des réserves est consommée par la plante (Pollock, et al., 1996). En climat tempéré, on estime une perte de poids sec de la griffe de près de 15% sur cette période. En parallèle, la concentration en glucides diminue (Hughes, 1992).

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Getting to know the **new varieties** better

The beginning of the 21st century has seen an upsurge in new varieties, with 143 registered between 2000 and 2021.

Although the creation of new asparagus varieties has been accelerating since the start of the twenty-first century, the reference varieties remain firmly established. A new project to set up an international experimentation platform will make it possible to better assess the potential of new varieties.

BY GUY DUBON

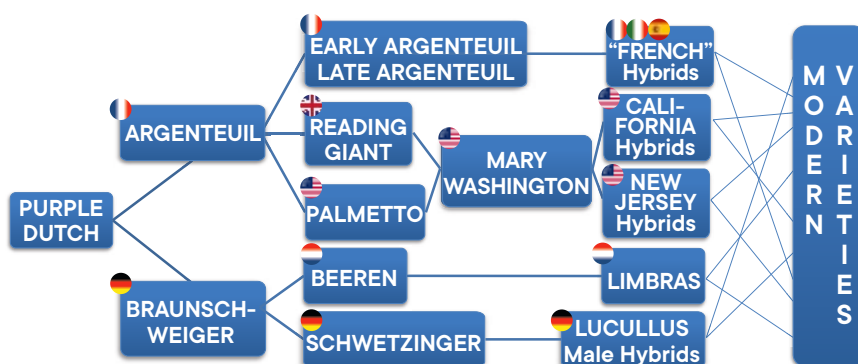
German and French varieties soon emerged, as did Dutch, British, American and, later, Italian and Spanish varieties (Graph 1).

Two varieties dominate the world

“After massal selection, the asparagus varieties constitute the hybrids of a genealogical selec-

A *sparagus officinalis* is presumed to have originated in Eastern Europe. The earliest signs of the plant’s domestication can be found in the Caucasus and Siberia. The Greeks and Romans then imported the crop and its consumption spread. Roman writings mention its cultivation, which spread with the Empire throughout Europe, before almost disappearing from the decline of Rome until the Renaissance, which also marked a renaissance for asparagus. Several types of asparagus were described in France and Germany, with Purple Dutch believed to be the oldest variety. The family tree that started with Purple Dutch led to the modern varieties, thus testifying to the crop’s internationalisation.

GRAPH 1: ORIGINS OF THE WORLD’S FIRST ASPARAGUS VARIETIES



Source: Julien Rocherieux

tion,” explained Agrosome consultant Julien Rocherieux in a brief history of the genetic improvement of asparagus he gave at International Asparagus Day (see box). This beginning of the twenty-first century has seen a surge in new varieties. “143 varieties were registered between 2000 and 2021, from 37 breeders and 17 different countries, whereas before 2000, ➔

Different selection methods

Populations, Massal selection: The simplest and oldest method involves selection of the best male and female individuals of a population that are naturally intercrossed.

Improved populations, Familial selection: Similar to the previous one, it is based on the value of the progeny of elite individuals identified within a population.

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- **Clone hybrids:** Made possible by in vitro culture, a single male plant is crossed with a single female plant to obtain maximum hybrid vigour.
- **Double hybrids:** These are obtained by crossing male plants from one hybrid with female plants from another hybrid.
- **Male hybrids:** Considered more homogeneous, 100% male hybrids are possible by obtaining “super-males (YY)” via androgenesis (another culture) or hermaphroditism (male and female flower on the same plant).



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100% male hybrids are possible by obtaining “super-males” and are considered more homogeneous.

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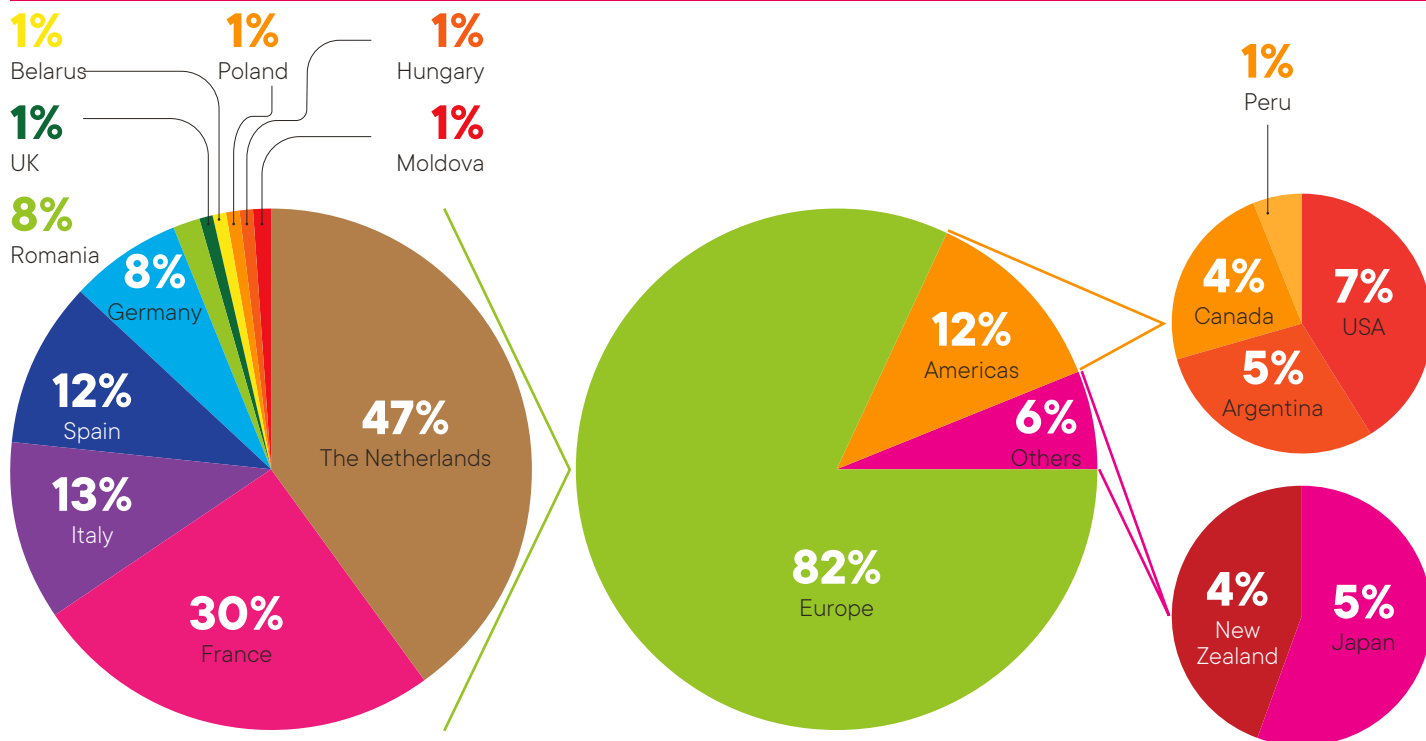
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GRAPH 2: ORIGINS OF THE VARIETIES CREATED SINCE 2000



Source: Julien Rocherieux

➔ *only 103 varieties had been registered,*” he said (see Graph 2). The selected varieties are mainly from European, North and South American, New Zealand and Japanese companies, but they concern all of the planet’s geographies and climates (see Asparagus World n°1). However, developing new varieties is a lengthy process. *“In general, professionals are more likely to plant varieties they already know because they provide more reassurance. Thus, two varieties dominate the world: UC157 (created in 1978) for warm climates and Grolim (1994) for temperate climates,”* said Julien Rocherieux.

Beneficial returns for producers and breeders

There are multiple obstacles hindering the quick spread of new varieties. First of all, asparagus is a perennial crop, lasting for about 10 years. *“It is*

also difficult for a producer to know about all the varieties available and the potential of each,” said the specialist. Indeed, it takes at least three years to make the first reliable assessments of a new variety, and at least seven to have certainty about its characteristics and qualities. In addition, varieties behave differently in different climates. Rocherieux also presented a project to set up an international experimental platform for identifying new varieties. Integrated into a global testing network with a reliable experimental model adopted by recognised producers, the new varieties will be tested on plots monitored by Befve&Co’s international technical consultants. *“The observations will be used to compile technical reports and confidential data will be centralised on a computer platform,”* said Rocherieux. *“This project will yield beneficial return for both producers and breeders.”* **AW**

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La carrera por buscar la **reemplazante de UC 157**

Productores chilenos de espárragos iniciaron hace un tiempo el necesario recambio varietal para reemplazar a UC 157, una variedad que lleva ya cuatro décadas establecida en el país. En esa búsqueda, han aparecido otras variedades californianas y también 'supermachos'. Si bien el recambio se está dando, los productores aún siguen confiando en la vieja variedad.

POR RODRIGO PIZARRO YÁÑEZ

A diferencia de otras especies hortícolas, que han mostrado un gran dinamismo varietal en pocos años, la industria esparraguera chilena ha basado su desarrollo en pocas variedades, sustentándose básicamente en una de ellas, la UC 157, una de las primeras variedades obtenidas por la Universidad de California Riverside en 1975, convirtiéndose en el primer híbrido clonal comercial. No pasó mucho tiempo para que se instalara en el país y a los pocos años aparecieron otras dos: Atlas y Apolo. La primera aún está presente en los campos, aunque ya en retirada porque los turiones gruesos no son del gusto de los mercados de exportación, pero sí del doméstico. De la segunda, poco se alcanzó a comprobar, porque desapareció al poco tiempo de los huertos. El negocio del espárrago en Chile ha vivido altos y bajos, con épocas muy buenas hasta que las producciones peruanas comenzaron a desplazar a las chilenas. Ahí, los productores buscaron una solución lejos del espárrago

Campos de espárragos en la zona centro-sur de Chile.



© R. Pizarro

fresco, concentrándose fundamentalmente en el congelado IQF, que hoy concentra el 90% de las producciones del país, las que en su totalidad se destinan a la exportación. El 10% restante es para el mercado local, que lo consume en fresco. Años buenos, años malos, los productores que aún se mantienen en el negocio, lo hacen porque aún es rentable. Eso es lo que ven también otros, que están incursionando con la hortaliza, básicamente porque la ven como el complemento perfecto a la producción de berries (arándanos, frambuesa y moras) para mantener 'fidelizada' a la mano de obra desde septiembre a abril y ocupadas a las plantas de proceso por siete meses en vez de cuatro.

ABSTRACT

Rodrigo Pizarro Yáñez, Journalist (Periodista)

After four decades in Chile, the UC 157 variety is still the queen, but an industry that relies on frozen produce for export needs varieties with better export performance. That is why the sector is undergoing a varietal replacement process, although the country's producers continue to trust this old Californian variety.



A la 'Reina' le han salido 'Princesas' al camibo

Pero, ¿por qué transcurrida casi cuatro décadas, UC 157 sigue siendo la reina de las variedades ➔



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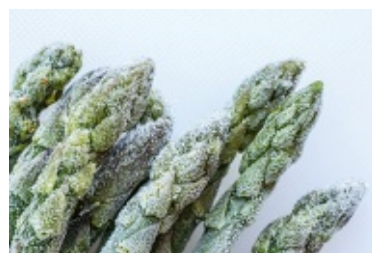


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El proceso de renovación varietal es más lento que para otros cultivos ya que la variedad UC 157 da buenos resultados en el país desde hace más de cuatro décadas.

➔ en Chile? Básicamente, porque es un material genético que ha demostrado tener una buena adaptación y resiliencia frente a las condiciones diversas y adversas y con un rendimiento exportable similar al que se obtiene con las nuevas variedades. Así es como hoy en día está presente en el 65% del total del área sembrada en el país, que se calcula en unas 3.000 hectáreas. Solo cinco años atrás había un 80% de la superficie sembrada con esta variedad.

En la temporada 2011/12, el Instituto de Investigaciones Agropecuarias (INIA) inició las evaluaciones con una serie de variedades, donde estaba UC 115 (De Paoli), un material genético también de California



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que, tras esos ensayos, los responsables del estudio destacaron su precocidad, que permite ser cosechada dos o tres semanas antes que UC 157, dependiendo de las condiciones climáticas, aunque eso también podría jugar en contra, en caso de haber algún episodio de heladas. No es la única característica positiva, ya que también el peso de los turiones es mayor (21 a 23 gramos). Para aquellos productores que buscan vender un espárrago más grueso, la opción es UC 115.

Hay un recambio varietal en las principales zonas productoras del país. Eso nadie lo discute. Los mercados así lo exigen y los agricultores buscan un material que les permita alargar la campaña con un espárrago de calidad superior y con rendimientos mayores, que permitirían llegar a un promedio de 15 t/ha, cuando hoy es de 7 t/ha. Sin embargo, en la búsqueda de nuevas variedades, y tras los ensayos de adaptabilidad de nuevas variedades a las condiciones del centro-sur del país, ninguno de los grandes campos chilenos dedicados a la producción de espárragos ha decidido cambiar el 100% de la superficie. El recambio se va haciendo en superficies de 10 a 20 hectáreas, pero sin dejar de lado a la UC 157. Los expertos señalan el hecho de contar con un material certificado es muy importante si se desea tener calidad de producción y también sanitaria. Espada es el nombre de otra variedad de la Universidad de California que, en ensayos realizados por el INIA en 2015 era un material que aún no estaba liberado, pero del cual se calcula que hoy en día cubriría un 5% de la superficie total, mostrando óptimos niveles de rendimiento exportable, con turiones de un peso promedio de 23 gramos.

Los 'supermeachos' tienen su espacio OS

Como una forma de optar a mejores rendimientos productivos y de exportación es que arribaron al país las variedades de la Universidad de Rutgers (New Jersey, EE UU) como NJ 953, NJ 1113 y NJ 1122, que hasta no hace mucho tiempo no estaban en la órbita de los productores de espárragos en Chile. Sin embargo, desde su llegada al país y fueron validadas bajo las condiciones de las principales zonas de producción, ubicadas en la zona centro-sur, han mostrado ventajas que, hasta ahora, no se conocían entre los esparragueros chilenos. La principal es el rendimiento productivo de cada una

de ellas, ya que se trata de híbridos de alto rendimiento, si se las compara con la UC 157, por ejemplo. Mientras el potencial de la UC 157 en campos chilenos era de 8 t/ha, el promedio no superaba las 5 t/ha. Sin embargo, con el material obtenido en New Jersey se han visto producciones de 10 t/ha en los primeros cuatro años, y que a partir del quinto año se llega a 15 toneladas por hectárea que, traducido en rentabilidad para los agricultores, estos podrían obtener US\$10.000 por hectárea. Otros 'supermeachos' que se han evaluado son aquellos obtenidos por la Universidad de Guelph (Canadá), destacando por sus niveles productivos. Además, se ha evaluado a la línea de variedades neozelandesas Pacific, como Pacific Miracle y Pacific Star. En muchos casos, las

Ñuble, la principal zona productora

La región de Ñuble, a unos 400 km al sur de Santiago de Chile, es la principal zona de producción en el país, donde se estima que hoy en día existen unas 1.200 hectáreas destinadas al cultivo, en localidades como San Carlos, Coihueco, El Carmen, Pinto y Chillán. La superficie que va creciendo cada campaña. Una serie de viveros han asumido la fuerte demanda por plantas que ha habido en los últimos años. Un huerto de 10 hectáreas es el tamaño adecuado para producir esta hortaliza que, en Chile, la primera cosecha comercial es al cuarto año y el peak productivo se alcanza al octavo año.

Esparragueras regadas con pivote en Chile.



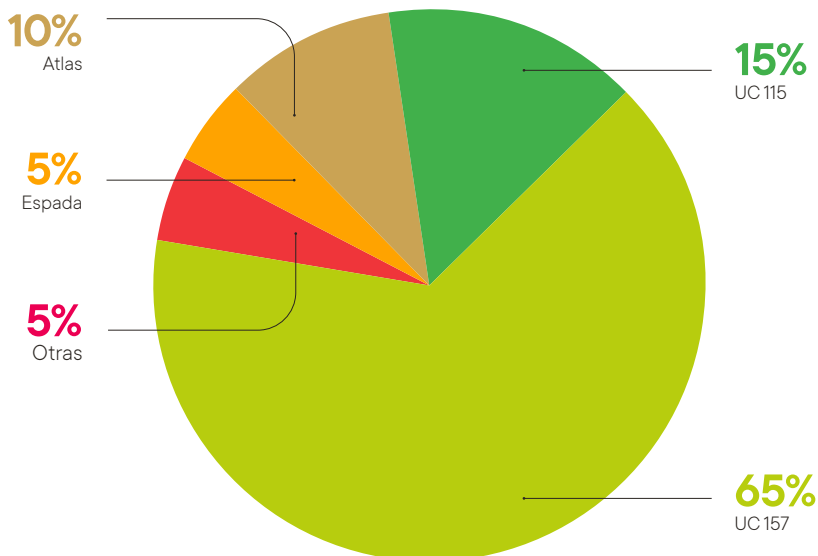
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evaluaciones de las diferentes líneas de 'supermachos' fueron positivas, pero había algo que jugaba en contra de ellas y era la poca disponibilidad de semillas, lo que dificultaba la recomendación de estas variedades a los agricultores.

Otros retos del cultivo en Chile

El recambio continuará, pero una variedad de características superiores no es garantía por sí sola de tener mejores rendimientos. Para ello es fundamental mejorar los manejos agronómicos en el cultivo, empezando por la preparación de los suelos en profundidad, el control de malezas, el riego y el control de plagas, como son las larvas de suelo. En cuanto al riego, lo que hay que evitar es el aposamiento y hacer riegos profundos en cosecha, señalan los expertos. Los productores pequeños no están acostumbrados a regar los huertos, pero la recomendación de los investigadores del INIA es que solo regando tres veces al año es posible aumentar los rendimientos entre un 20% y 30%. En los ensayos que realizó el INIA se demostró también que, tras probar diferentes sistemas, el goteo fue el que mejor se adaptó al cultivo. Por contrapartida, la cinta exudante no funcionó como se esperaba y se descartó rápidamente porque no hubo un mojamiento uniforme. Si bien en Chile hay una importante superficie que es regada con pivote, hay que tener cuidado con la humedad porque eso podría generar problemas con hongos. Otro tema es el control de las malezas, donde la más importante es precisamen-

VARIETADES DE ESPÁRRAGO CULTIVADAS EN CHILE (EN %)



te la propia maleza de la esparraguera, quizás por ello es que hay productores que han optado por los 'supermachos', porque no generan esa semilla que va cayendo al suelo y germina formando una planta junto a la planta comercial. Estos y otros manejos son necesarios para que el cultivo siga reencantando a productores y la hortaliza sea vista como una real alternativa productiva en el país. *AW*



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Wild asparagus: **a new crop**

Asparagus acutifolius is well known in Europe's Mediterranean regions, like Slovenia, where it grows in the wild, but is almost completely unknown elsewhere. While people pick this wild asparagus, it is rarely grown as a field crop, despite the fact that demand significantly outstrips supply. The main reason lies in the fact that the seeds are very difficult to germinate.

BY MOJCA REHAR KLANČIČ

The idea of planting a production field with wild asparagus (*Asparagus acutifolius*) emerged many years ago. But it was soon realised that finding planting material would not be easy. Transplanting wild plants was not an option, so growing plants from seeds was the only way possible. Learning when, where and how to collect seeds in nature was no easy task, but the true challenge lay in figuring out how to break the seed dormancy.

Similar to growing green asparagus

Asparagus acutifolius grows wild in the Mediterranean regions of Europe, but has the ability to morphologically adjust to various growing conditions. When grown in well-draining soil, it can easily survive temperatures as low as -20°C without suffering any damage. We have tested them in different climates in our country (no cover or other winter protection was used). The plants are extremely drought tolerant, but for higher yields, some form of irrigation is advisable. Water supply is most important in the period right after putting the plants into the soil. The plants will soon develop a very deep root system. The cultivation technology is very similar to that involved in growing green asparagus, with the difference that *A. acutifolius*

In Slovenia, Mojca Rehar Klančič created a nursery to grow wild asparagus.

Edible young shoots of wild asparagus are harvested in nature in the spring. In plantations, possible irrigation means higher yields.



© Mojca Rehar Klančič

In nature

Asparagus acutifolius grows in very poor soil, finding its way between rocks and other bushy vegetation. The first spears can be found in nature as early as February in sunny and sheltered locations. Main growth is expected in April or early May and ends in mid-June in colder, shady locations. The species is dioecious, i.e. each plant bears only male or only female flowers. There is a high degree of natural variability in the plant habitus, but all plants are prickly, the flowers are light yellow and the seed coating is almost black when ripe.



© Mojca Rehar Klančič

Wild asparagus is a delicacy. It has a very intense and bitter taste.



© Mojca Rehar Klančič

grows slower, but lives longer, remaining productive for many decades. In natural environments, the plants seem to live forever. Fertile, pH neutral or alkaline soil in a sunny or semi-shady position is ideal for reaching optimum productivity. But how many plants should we place per hectare, should we plant in one or two rows, how wide should the path between rows be? We have found the best solutions for all of these questions: Plant in two rows 40 cm apart, with an in-row distance between plants of 60 cm. If we need

at most 1.3 m for walking, at least 40 cm needs to be taken in account for plant growth (see sketch), and there should be approximately 16,000 plants per hectare. The first harvest can be expected three years after planting. The key is to pay attention to the diameter of the spears, which should be no less than 5 mm. The prickly branches are not an issue when picking the crop if long sleeves and gloves are worn. The spears are collected from both the male and female plants. The species is suitable for organic production, and as the wild plant is not affected by any serious pests or diseases, any plants grown from seeds collected in the wild will be healthy.

Accompanied by different cover crops

Experiments have been conducted with different cover crops used to protect the soil and enable wal-



Market and flavour

During years of research, Mojca Rehar Klančič has exchanged ideas with friends and colleagues about the culinary value and marketing potential of wild asparagus. Patricija Pirnat, Production Manager at KZ Agraria Koper (<https://www.kz-agraria.si/o-nas>), said: *"We invest no energy in the marketing of wild asparagus, as it comes and goes from our warehouses very quickly. It is so popular that it is literally sold out as soon as it comes onto the market. We purchase shoots that are up to 20 cm long, tie them into bundles that are 5 cm in diameter and send them to customers. High-end restaurants love them very much."* Slavica Smerdel, master chef and author of many cookbooks, described the tastes and introduced us to some of her recipes: *"Wild asparagus is a delicacy. It has a very intense and bitter taste, which is stronger than that of cultivated asparagus. The most famous and popular recipe with wild asparagus is "Frtalja". My favourite recipe with wild asparagus is to combine wild rocket salad, boiled wild asparagus, a hard-boiled egg, goat's cheese and olive oil."*



© Mojca Rehar Klančič

In nature, they grow in hard-to-reach areas, between rocks & other vegetation.

king without worrying about mud. In the first year, an annual crop like phacelia is sown on the walking paths. This allows the weeds to be controlled and also provides some shade to help the young plants establish themselves in the new environment. The cover crop can be mulched during the growing season if necessary. Dead organic matter should be left on the soil as mulch during winter. In the third year, a dwarf variety of *Trifolium repens* can be sown on the walking path between rows, and it will eventually cover all the space between the plants. This aids in fighting weeds and adds some nitrogen to the soil. As there



© Mojca Rehar Klančič

Asparagus acutifolius is an evergreen perennial whose spring spears are highly prized.

tends to be a great deal of rain during harvest, a thick *Trifolium* carpet allows pickers to walk without worrying about mud. **AW**



© Mojca Rehar Klančič

Seeds collected in nature are very difficult to germinate, so the big challenge was how to break the seed dormancy.

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© Asparagus World

Varieties for **new planting**

The choice of variety and crown affects the production potential of any asparagus crop. Together they provide the genetic potential and the necessary energy. They are also non-modifiable parameters for the entire duration of the crop. Making the right choice requires taking into account not only

production variables such as climate, soil and water resources, but also the markets and future outlets. Despite the highly diversified and globalised nature of varietal innovation (see page 38), confidence in variety and crown quality remains a key factor determining the success of a new plantation.

Planasa

launches three new 100% male varieties

Darzán, Darkong and Darius are the new offerings unveiled by the plant innovation specialist for the coming campaign. Planasa has begun the process of renewing its asparagus catalogue with the addition of these three new 100% male varieties, each of which is focused on a different market and with very different positioning. Manuel Garcés, director of Planasa's Garlic and Asparagus EMEA business, describes the different varieties: "Darzán is intended to become a leader in the early segment, mainly in Mediterranean markets (Spain and Italy). It has a uniform medium-sized spear (between 16–20 mm on average), very good yield, excellent quality and a very attractive appearance, all combined with a long shelf life. It can produce either white or green asparagus. Darzán has a very good flavour and its plant is vigorous and rustic. As for Darkong, this variety is aimed at Northern European markets. It is the perfect complement for early varieties to allow a longer production cycle. The spears are large (LESS THAN 20 mm) and of exceptional quality, with a very tender and pleasant-tasting skin and flesh. Though it can also be used for green, it is mainly used for growing white asparagus. The plant has great vigour and hardiness. Lastly, Darius is a late variety, ideal for ending the campaign due to its productivity and its late branching. Its spears are medium-sized (16–20 mm), it has very good quality and is suitable for producing both green and white asparagus." Visitors can see these new varieties at Planasa's testing fields in Granada. [GZ](#)



© Planasa

Walker Brothers

new promising hybrids

This year, Walker Brothers, Inc. celebrates its 50 year anniversary in the asparagus business. In 1972, its first asparagus plantation was planted, in Pittsgrove, New Jersey, in the US. Today, its asparagus seed business has reached over 40 countries across the world. As a leading global asparagus seed company, Walker Brothers is excited to continue producing high-quality, popular Mediterranean-climate green asparagus varieties – such as Atlas F1™, Apollo F1, Grande F1™, UC 157 F1 and Purple Passion F1 – for its growers worldwide. The company also produces seeds and crowns of one of the North American dominant varieties, Walker Deluxe F1. This January, company president Scott Walker officially introduced new promising hybrids, such as WB212 and WB233, at the Mid-Atlantic Fruit and Vegetable Convention in Hershey, US. Small scale commercial production fields with the new hybrids will be established this year in Italy and Spain. Walker Brother's European exclusive distributor, Blumen Vegetable Seeds, will provide the best possible support for the growers who are currently growing or interested in testing the Walkers' current and new hybrids. The Walker Brothers and Blumen Vegetable Seeds teams look forward to seeing their asparagus friends at the 15th International Asparagus Symposium this June in Corboda, Spain. [GD](#)



© Walker Brothers, Inc.

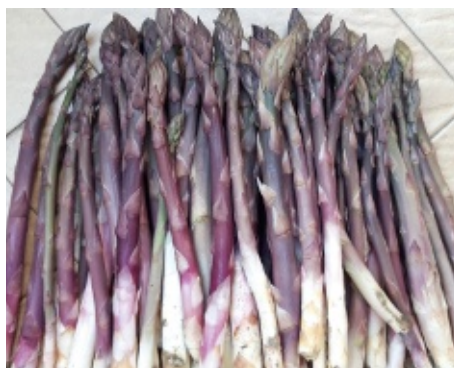


@ Coviro

Coviro

offering Athos, Saent and Verdus

Cervia-based nursery Coviro has confirmed its leadership in asparagus, offering a wide range of varieties. "While 90% of our sales are to the Italian market, in recent years, we have also started selling in Slovenia, Hungary, Germany and France. About 75% of the market is represented by varieties suitable for producing green asparagus, with the remainder is suitable for white. Lately, the demand for violet and wild asparagus has also been increasing. A recent innovation is Saent, which is a cross between violet asparagus and bitter Montine asparagus. In terms of green asparagus, we have introduced Verdus, which is of Dutch origin, and Athos, an Italian hybrid with good precocity," said marketing manager Marcello Sbrighi. [GO](#)



@ Lamboseeds

Lamboseeds

delighted with success of Saent

Lamboseeds reports being very pleased with the success of its Saent asparagus and aims to increase production. "In recent years, demand for Saent has increased significantly both from the supermarket and food service channels. This is thanks to Saent's special bitter taste which makes it different from all other asparagus and has made it sought after by connoisseurs. It is precisely for this reason that we're starting to experience a shortage in the availability of roots, and we're considering increasing production so we can meet consumer demand for this unique product," said sales manager Sandro Colombi. [GO](#)



@ Blumen

Blumen

launches the Italian Vittorio variety

Blumen continues to distribute the best asparagus tips, both as the exclusive European distributor of Walker Brothers and with varieties developed in-house: "We have started to successfully distribute Vittorio, an Italian variety developed by Agostino Falavigna. It is particularly suited to the soil and climate conditions of northern Italy and central-northern Europe," said marketing and sales manager Stefano Motton. [GO](#)

Arlim b.v.

100% produced on virgin land

A producer of asparagus crowns for over 40 years, Johan Zeegers started out as an advisor in the cultivation of asparagus worldwide. Now it is the leader in the production of asparagus crowns, with a total of 12 million crowns in 2021. Arlim b.v. produces white, green and purple asparagus crowns from the Limgroup, Bejo, SudWestDEutscheSaatzucht group in the Netherlands. All these crowns are 100% produced on virgin land certified by the Dutch NAT. The crowns are sorted, calibrated and packaged on demand. The asparagus crowns are delivered by the firm's own fleet of trucks and it provides a free planter. Arlim b.v. has expanded into French-speaking countries, with representatives such as Halter Jean Luc. Today, its professionalism is allowing Arlim b.v. to expand its activity during the winter season by offering an on-demand search for specific used asparagus machinery (graders, ridgers, tillage equipment, etc.). [GD](#)



@ Arlim

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Ever more innovations

Asparagus is also a world of innovation. Among the many new developments, all the key trends in agriculture today are covered. There's improved performance and efficiency in the fields and greater

respect for the environment, thanks to more use of bio-control products and less of water. The technology also continues to advance in machines, software, etc. Expect more and more innovations in 2022.

Base

a solar kit for harvesting machines

Base is proposing to automate the charging of your asparagus harvesting machine's batteries by equipping it with a solar kit. Two solar panels, a charge regulator and cable: a very simple system to save precious time during harvest by removing the problem of charging batteries. At the slightest ray of sunlight, the batteries recharge, avoiding being drained and improving their lifespan. No need to remove them in the evening to put them on overnight charge. These solar systems fit on all machine models. The installation is easy, so that you can do it yourself.



© Base



© Huet

Huet

installation and removal of plastic films

Huet has constructed a DRBA type machine, for placing and removing plastic pocket films on asparagus mounds. The width-adjustable platform allows for working on two rows and makes the black/white face changeover very quickly (6 to 7 km/h). A single-row version is also possible.

Ener Green Gate

heating for asparagus

The precocity of asparagus production can be improved using underfloor heating from electrical resistors. The cables offered by Ener Green Gate are placed at the time of planting under the asparagus crowns (2 cables for a single-row plantation, 3 cables for a double row). The heat of the cables (25°-30°C) makes it possible to obtain a soil temperature of 18°C at the level of the crown and obtain up to 50 or 60 days of precocity with a consumption of 10 to 30 kw per linear metre. The system is used in Italy on open field green asparagus plantations under caterpillar/crawler.



© Ener Green Gate

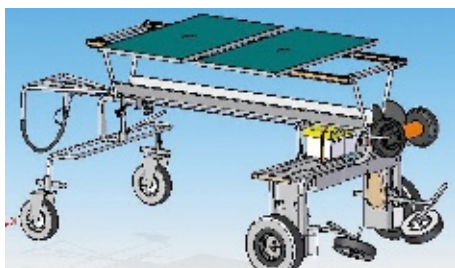
Engels Machines

more manageability for the AspergeSpin A1+

The AspergeSpin A1+ is an electrically driven harvesting machine for white asparagus. The AspergeSpin A1+ is equipped with two electric motors making an articulated steering possible with which the rear of the machine can be swivelled. Even on asparagus fields with uneven headlands, the AspergeSpin A1+ moves smoothly from row to row. The articulated steering of the AspergeSpin A1+ reduces the turning circle of the machine, meaning less headland is needed to manoeuvre from one row to the next. The machine is equipped with a protective roof for the picker, which can also accommodate photovoltaic panels in order to gain autonomy of use. Engels Machines also offers two green asparagus harvesting machines AS Green2.0 and ASVerde.



© Engels Machines



© Bagioni

Bagioni

installing solar panels

Two years ago, Bagioni introduced the possibility of installing solar panels to power its harvesters. Its modular system consisting of a lightweight frame made of special aluminium profiles, can house up to three 300W solar panels and an inverter controller. The number of panels required (1 to 3) varies based on the daily energy required and the actual weather conditions. One 300W solar panel provides sufficient power to harvest half a hectare (1.2 acres) of asparagus per day. After years of some dissatisfaction with plastic and resin hoops for asparagus plastic sheeting, it has started testing a hoop made of a new material this year. "We delivered 1,000 new hoops to our customers free of charge to check their durability." Benefits are significant compared to old hoops or wires: lower cost than iron, improved flexibility and shape memory feature to return to the original (straight) shape during storage.



© Europlastic

Europlastic

double-film family is growing

After the Multitech Double-Films Black/White+TH, and Multitech Double-Films Black+TH, Europlastic strengthens its range with the Multitech Double-Films Opaque Green+Green TH. This plastic improves thermal values of these products and meets eco-environmental requirements with its green color which enables this new product to blend in better with landscapes.

The Multitech Double-Films V/V can be used directly as mulch on hillocks or can be set on AMG40 arches. Set on arches, the contact of the spears with the film is avoided and thermal variations are attenuated.



© Cosmeco

Cosmeco

introduces new B70 bed former

Cosmeco has unveiled its new B70 bed former for working the land in which asparagus grows. The machine comes equipped with new accessories, such as directional external filling discs for accumulating the necessary extra soil to fill the bed and making grooves between beds for water drainage, as well as crust breakers to move earth trampled by tractors. The B70 creates beds of up to 70 cm in height with adjustable width, which offers the advantage of keeping the ground soft and stable. The machine's rotors are equipped with several types of blade to overcome issues with excessively compact soil, restore porosity, and hence facilitate the circulation of air and water.



© Réussir Fruits & Légumes

Corhize

AspaView® driving asparagus

AspaView® combines a set of connected sensors and a specific module of the Corhize app accessible on smartphone and PC to control the irrigation of white or green asparagus. This module makes it possible to monitor the water in the soil, the root consumption per layer in detail and to calibrate the volumes and frequencies of irrigation to be supplied according to the weather forecast. It is also used to calculate the hours of cold and degrees days until arriving in production, to alert on the risks of burning and flowering during the harvest, and also to give an indication of volume on the next harvest.



© Gauget

Gauget

the double hoop replaces pockets

The Gauget company is offering a double hoop system to replace the pockets (hems) for plastic asparagus mulches. Depending on the supplier, removing pockets saves 15–25% of plastic mulching, which is a very interesting advantage given the increasing costs of plastics today. The system also avoids the filling of pockets, producing a labour saving of about 400€/ha. The handling and destruction of plastics is also facilitated because there is no additional soil in the plastic. These hoops make it possible to leave the mulch partially open during high heat by opening "downwind" to prevent the spears from twisting. However, plastic handling is not mechanisable.



© Besnard

Besnard

a shorter 90° set up

Besnard is offering a new configuration of its asparagus cutting, washing and sorting line by artificial vision which has the advantage of being at 90° and L shaped. This delivers a significant saving of space: the length of the line decreases from about 13 m to 8 m. In addition, the ergonomics of the line is improved by giving the operator a 90° vision. The manufacturer is also offering a new CLA2000 HD, a high-performance washing and cutting machine. "This machine for asparagus has been adapted to also take other vegetables, such as black radish, sweet potatoes, etc., for a +++ wash," the company says. In addition, Besnard offers a machine that is aimed at the smallest businesses: it is a packaging line that allows for packaging in bulk and for automatic preparation of bunches.



© Reyenvas

Reyenvas

Elastic thermosetting films

Reyenvas, S.A. has continued to develop its range of elastic thermosetting films with incredible results in terms of quality improvement, productivity, and labour savings. This range, called Rey Pro TR and Rey Pro Elast, developed with and for F.I. Trading have already passed their testing phase and will be presented at the IAS 2022 in Córdoba.



© Neubauer

Neubauer

pre-cutting unit with additional asparagus washing

Neubauer Automation stands for the development of innovative, modern machines for processing asparagus. Technical development is a way to simplify work sequences, reduce costs and increase productivity. At customer request, Neubauer has built a pre-cutting unit with additional asparagus washing. There are companies that want to pre-cut the long harvested field asparagus and wash it additionally. The advantage at high sorting speeds is the extended washing segment, as well as the better handling of the already shortened spears in the subsequent sorting process. A common 5.5 kW pump with a flow rate of 30 m³/h increases the cleaning of the asparagus, especially in heavy soils. In addition, Neubauer Automation is launching an automatic tilting device for harvest boxes filled with water, with automatic scanning of the raw materials of the harvest helpers and fields. This significantly speeds up the box change and the scanning process, increases safety during scanning and makes the work of workers easier when placing the spears. "Thanks to our system for removing asparagus husks, which has been tried and tested for years, a solution has been created in the field of placing the spears technique in order to create a consistently high sorting performance quickly, safely and efficiently. Customers are happy about the added value," Neubauer says.



© Tenrit

Tenrit

peeling white and green asparagus

The Tenrit solo A Green makes it possible to peel white and green asparagus with the same machine. Changes in the pressure and the length of peeling of the spears are carried out directly automatically at the touch of a button. The flow rate of the machine is one asparagus per second and it can be supplied manually or automated by conveyor belt. Tenrit also offers the Frische-box, a customisable stainless-steel console to keep asparagus fresh in ice.



© OROAGRI

Tradecorp

product boosts soil responsiveness

To boost water management responsiveness, Tradecorp, one of the leading experts in biostimulation and sustainable crop nutrition, has added Transformer® to its portfolio of new-generation products, in response to the current need for sustainable water management. This revolutionary product boosts soil responsiveness in all types of crops. Transformer® aims to be an effective water optimiser that improves hydraulic properties such as water infiltration, distribution and drainage throughout the soil profile and porosity. Its exclusive formulation reduces water surface tension and waterlogging in compacted areas, as well as enhancing conductivity and water retention in light soils. Transformer® locks in soil moisture, functions as a soil conditioner, facilitates nutrient uptake and helps to improve the nutritional balance of crops with a subsequent increase in final yield. Transformer® is recommended for all crops, and can be applied through drip, microsprinkler and overhead irrigation systems, or directly onto the soil before or after planting.



© Medinbio

Medinbio

improves soil health and asparagus yield

"Gaia sol application, 3Kg/ha in February, before hilling, optimized the yields by enabling the development of EXTRA grade shoot (+16%), resulting in a more qualitative (and valuable) yield", explained Medinbio after its approach including the application of GAIA SOL in ground spraying to a conventional management in 2021. GAIA SOL also helped support plant fitness and lower the percentage of downgraded shoot (~26% unmarketable asparagus). "The combined action of the synergistic microorganisms Bacillus and Trichoderma within Gaia sol resulted in a higher rate of superior quality shoots and a reduction of yield loss", said Medinbio



© Cavare

Cavare

eco-responsible and recyclable packaging

A French manufacturer of fruit and vegetable packaging since 1988, Cavare Packaging offers a whole range of customisable products, dedicated to asparagus. This range offers: bunch sleeves with protective cover (all held in place with an adhesive strip), complex and protective covers for crates, as well as cardboard trays. This family business is committed to supporting producers in the current ongoing 'green' transition, spurred in particular by the French AGECE law. Its packaging is eco-responsible and recyclable, and labelled Imprim'Vert. Kraft paper and cardboard are now replacing plastic, and the materials used are moisture resistant, thus taking into account the constraints of asparagus.



@Terrial

Terrial

bio-based organic acids

Terrial has launched Forti K+, its new potassium fertilizer (2-0-40 + 45 SO₃) coming from the production of bio-based organic acids. This product, of premium quality, Organic Agriculture certified, and low in chlorine, will make it possible to develop customised formulas to meet diverse demands and specifications. Forti K+ will be marketed in compacted form (pure or mixed), and caps (mixed with organic matter). The results confirm the effectiveness and value of Forti K+, showing better yields, enhanced nutritional qualities thanks to an effective synthesis of sugars, storage qualities and consequently resistance to shocks, handling and better preservation. Forti K+ will be available in a few months for market gardening, vines, arboriculture and field crops.



@RIVULIS

Rivulis

Reelview: "your crop's eye in the sky"

Rivulis wants to support growers through an innovative concept: Reelview. For any Rivulis drip installation, the grower will have free access to the Reelview application allowing them to increase the level of their crop monitoring through satellite images highlighting the vegetation cover and plant wetness variability. Precision irrigation and agronomic performance are the strong values shared by Rivulis and the growers using Rivulis products. Reelview is part of this continuity with the objective of providing an ever more competitive service to growers.



Source: Getty Images/Stockphoto

Zero Résidu®

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Asparagus growers are facing strong challenges around the world (such as from insects, fungal and bacterial infections, and soil infertility). Founded 3 years ago, French start-up Zéro Résidu® focuses on all these issues and has developed exclusive, efficient chemical-free solutions to help growers fight against these challenges. Zéro Résidu® has sourced natural active ingredients from around the world (yeast, bacteria, essential oils, algae, botanical extracts, etc.) and uses them in exclusive agronomical formulas to produce plant immunity response to pathogen attacks. Zéro Résidu® solutions guarantee growers residue-free production for efficient plant development. All solutions can be used in organic production.



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WHO MOVES THE MOST ASPARAGUS?

Global asparagus imports continue their upward march and these are the countries accounting for the bulk of that thriving trade.

BY JULIE BUTLER [@FreshScribe](#)

#1 MEXICO TO US

The top trade flow for fresh and chilled asparagus (HS code 070920) is from Mexico, the #1 exporter of this product, to the United States, the #1 importer. Mexico sends the bulk of its production to its neighbour, a country hungry for healthy products. UN Comtrade data shows that in 2021, the US imported \$409.5 million worth of Mexican asparagus (off a volume of nearly 197,000 tons). However, while the import volume has increased every year since 2015, the value has fluctuated, reaching nearly \$435.2 million in 2019 then slipping to \$384.7 million in 2020.

Nevertheless, compared to 2015, US imports from Mexico have increased 47% in value since 2015 and the volume by almost 92%.

#2 PERU TO US

The next biggest trade flow in fresh asparagus globally is from Peru to the US, with imports valued at \$332.9 million in 2021 from a volume of nearly 102,000 tons.

The asparagus that the US imports from Mexico and Peru combined accounts for almost 60% of the world total. Until 2017, when Mexico overtook it, Peru had been America's top supplier in terms of value despite its volumes being lower than its main rival's. Compared to 2015, the value of US imports of Peruvian asparagus in 2021 has slumped 11% but an indication that Peru is regaining lost ground is that the value has now risen every year for the last 3 years, making for 5.45% growth from 2019–21.

#3 MEXICO TO CANADA

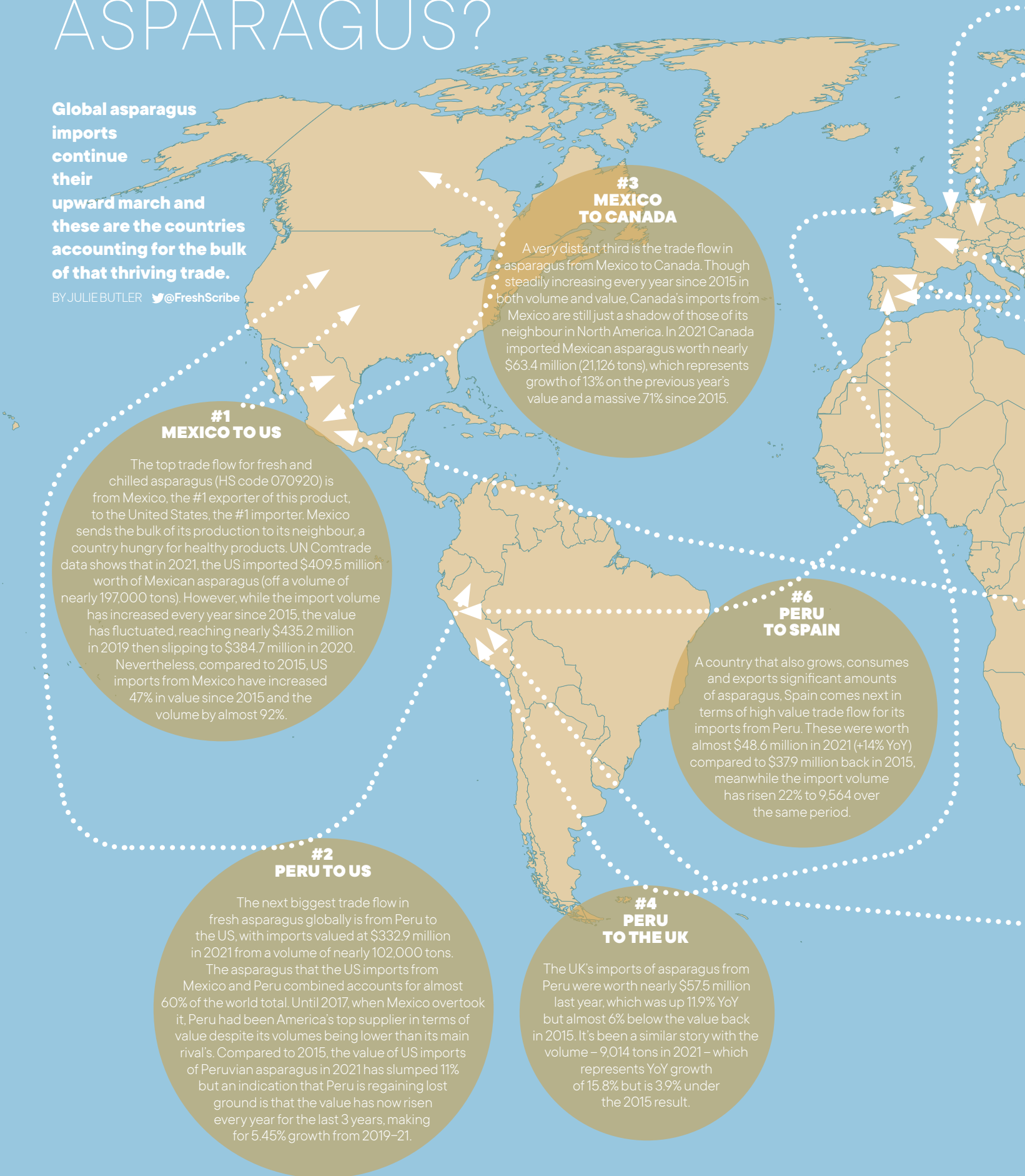
A very distant third is the trade flow in asparagus from Mexico to Canada. Though steadily increasing every year since 2015 in both volume and value, Canada's imports from Mexico are still just a shadow of those of its neighbour in North America. In 2021 Canada imported Mexican asparagus worth nearly \$63.4 million (21,126 tons), which represents growth of 13% on the previous year's value and a massive 71% since 2015.

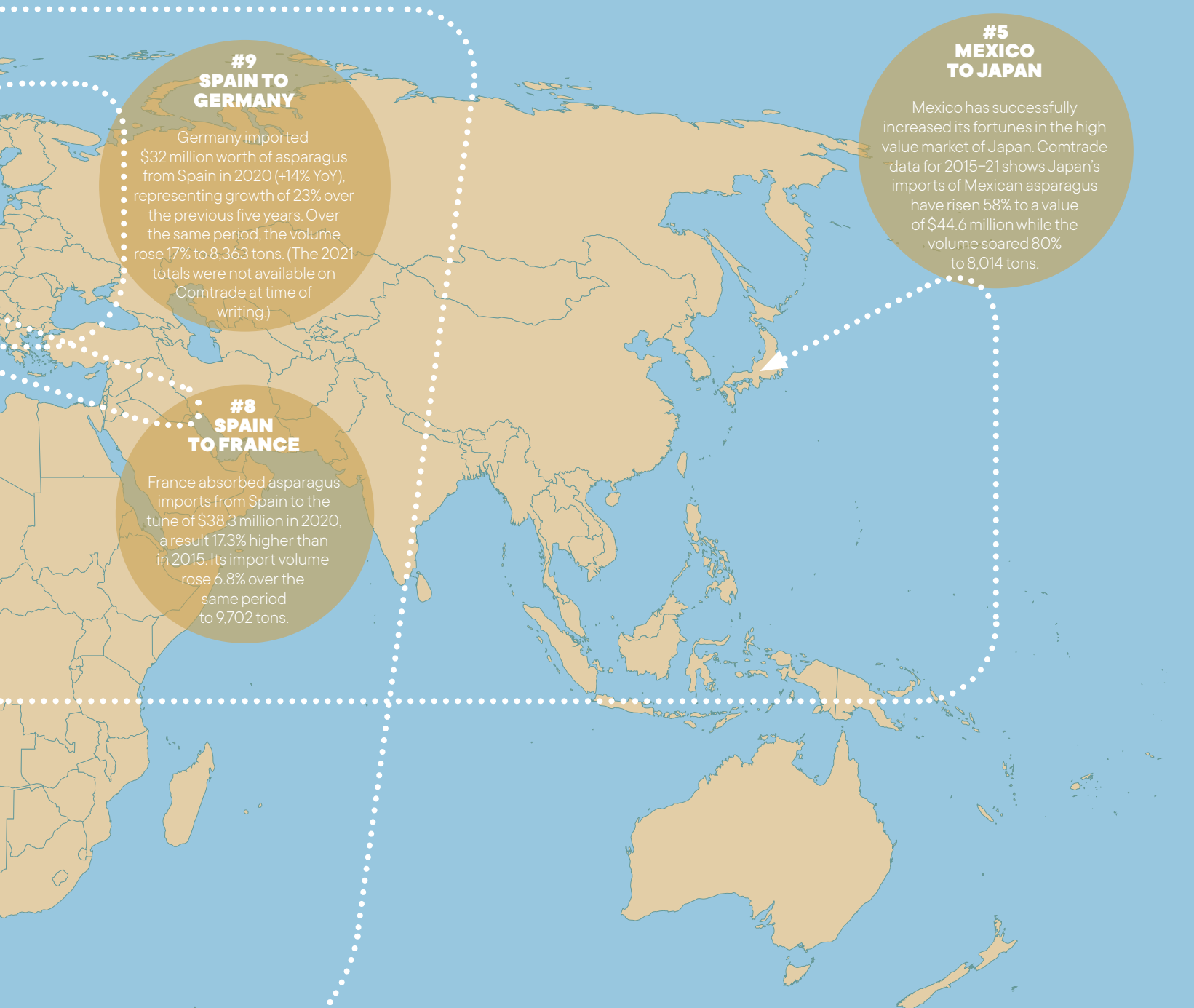
#6 PERU TO SPAIN

A country that also grows, consumes and exports significant amounts of asparagus, Spain comes next in terms of high value trade flow for its imports from Peru. These were worth almost \$48.6 million in 2021 (+14% YoY) compared to \$37.9 million back in 2015, meanwhile the import volume has risen 22% to 9,564 over the same period.

#4 PERU TO THE UK

The UK's imports of asparagus from Peru were worth nearly \$57.5 million last year, which was up 11.9% YoY but almost 6% below the value back in 2015. It's been a similar story with the volume – 9,014 tons in 2021 – which represents YoY growth of 15.8% but is 3.9% under the 2015 result.





**#9
SPAIN TO
GERMANY**

Germany imported \$32 million worth of asparagus from Spain in 2020 (+14% YoY), representing growth of 23% over the previous five years. Over the same period, the volume rose 17% to 8,363 tons. (The 2021 totals were not available on Comtrade at time of writing.)

**#8
SPAIN TO
FRANCE**

France absorbed asparagus imports from Spain to the tune of \$38.3 million in 2020, a result 17.3% higher than in 2015. Its import volume rose 6.8% over the same period to 9,702 tons.

**#5
MEXICO
TO JAPAN**

Mexico has successfully increased its fortunes in the high value market of Japan. Comtrade data for 2015–21 shows Japan's imports of Mexican asparagus have risen 58% to a value of \$44.6 million while the volume soared 80% to 8,014 tons.

**#7
PERU TO THE
NETHERLANDS**

It's a different story however for Dutch imports from Peru. Their value of just under \$43.7 million in 2021 (+36% YoY) is nevertheless 11.6% lower than the total back in 2015. Similarly, the import volume has been eroded by 17% since then to come in at 7,196 tons last year (+24% YoY).

In the last 20 years, global exports of fresh and chilled asparagus have more than doubled. From 195,184 tons in 2001 they rose above the 200,000 mark the next year and then a decade later surpassed the 300,000 mark for the first time, and since 2017 have been above 400,000 tons, FAOSTAT data shows. The highest total for the last 20 years was in 2019, when exports reached a record 455,034, then slipped down to 413,454 tons in 2020, a year dominated by Covid-19. Figures for worldwide imports of fresh asparagus largely mirror this climb, showing 2019 was also a record year with a total reported of 437,487 tons for a value equivalent to US\$

1.56 billion. This new highwater mark came in the wake of an average growth rate of over 5% between 2000–2009 and then at about 4.2% for the following decade. Apart from a few small blips, global asparagus imports have risen just about every year for the last two decades and signs suggest this trend is set to continue through this decade.





How the **asparagus market** is evolving in America

Fresh asparagus – by far and large green – is preferred over canned and frozen products in the US and demand is steadily climbing.

BY JULIE BUTLER [@FreshScribe](#)

As a side dish with a juicy steak, at a Mother's Day brunch, or on the backyard barbecue, Americans are eating more fresh asparagus. In the last decade, per capita consumption in the United States has risen 33% to 1.83 lb (830 g) a year. However, over the same period, US asparagus production has fallen 23% as imports rose 55%. Here we look at what's making these tasty green stalks more popular and emerging trends affecting the world's biggest asparagus importer.

Which US consumers buy the most asparagus?

Americans are eating more asparagus for a mix of reasons including increased year-round availability, supermarket discounts, interest in health benefits and plant-based protein, boredom with traditional veggies, and overall desire for a better diet. Though most pandemic restrictions have been lifted, many US consumers are still eating more meals at home and it's estimated 1 in 4 of them bought asparagus in the last 12 months, with Hispanic, Asian and those in the "other" category among those who buy the most. The likelihood of an asparagus purchase steadily increases with age and income is also a big factor, with shoppers in the \$100,000+ bracket more than twice as likely to buy asparagus as those earning below \$25,000 annually. However, one discount chain, where it was previously believed "people who don't have credit cards don't buy aspa-

“As the impact of inflation kicks in, cost-conscious Americans may want formats smaller than 1 lb.”



Chopping dead fern in early spring

© John Bakker

ragus," is said to now be selling more asparagus than ever.

How Americans like their asparagus

Unlike in Europe, white asparagus is so far more of a curiosity in America, rarely seen in stores, and while purple asparagus has received some good attention, retailers find it hard to place in their promotions because volumes are limited. Green spears, however, are no longer seen as a seasonal vegetable but increasingly found in supermarkets year-round. That's where Americans generally buy their asparagus, though the pandemic has provoked ongoing growth in the still small percentage of online sales. The lion's share of demand is for "standard" and "large" size spears, with 'jumbo' popular for food service, such as steakhouses. Supermarket price promotions are a key part of the marketing for asparagus and usually timed around spring-time holidays such as Easter and Mother's Day, with some stores doing cross-merchandising with meats and other cookout and party items.

More demand for smaller formats, social accountability

The pandemic increased hygiene concerns, and thus demand for pre-packaged goods, so some chains now offer the latter in addition to the usual 1 lb (453 g) bundles. One industry member predicts that over time the impact of inflation will see cost-conscious Americans asking for formats under 1 lb. Also forecast to gain traction is demand for social accountability going beyond fair trade. One source said while certifications such as SMETA and

US FRESH ASPARAGUS IMPORTS BY TOP 4 SOURCES (WEIGHT IN KG)

Source	2019	2020	2021
World	259,486,478	265,836,562	301,720,797
Mexico	165,865,218	170,234,888	196,922,380
Peru	91,285,818	93,676,472	101,999,868
Canada	2,062,038	1,288,648	1,888,709
Ecuador	226,816	510,843	862,258

Source: UN Comtrade HS code US imports 070920 (fresh & chilled asparagus)

GLOBALG.A.P. GRASP are currently recommended by retailers, eventually products won't be displayed without them. Most Americans buy conventionally grown asparagus, but one-third of buyers opt for organic at least some of the time and 13% say they always do. Mexico is the main source of fresh organic asparagus. Because of a fumigation requirement, Peru currently can't sell its organic asparagus fresh in the US, but there's hope of a niche for it in the year-round supply of frozen organic spears. As for fresh cuts, one source said there is no market for pre-peeled in the US, but there is for tips, and another avenue of growth is supplying custom-packed ingredients for meal kits firms like HelloFresh and Amy's Kitchen.

Domestic production dogged by input costs

The value of America's asparagus crop in 2021 was \$69.7 million (-11% YoY). Utilised production totaled almost 60 million lb (27,188 tons), of which 77% was for the fresh market and the rest for processing. High labour rates and other input costs are a major headache for growers, causing some to cut back or get out. Around 17,000 ha (-6% YoY) were harvested for fresh and processed spears last year. Michigan is the largest producing state, with 9,200 acres harvested in 2021, followed by 3,200 in Washington, 2,800 in California and 1,800 in New Jersey. Washington usually has the highest yield. Supply of high-quality organic asparagus continues to increase from year to year, according to the Vegetables 2021 Summary (USDA, NASS). Though its exports are minimal, the US does ship some fresh or chilled asparagus. In 2020, Japan, a high value market, took 25% of its total export volume of 16,120 tons, followed by the UK (15.8%), Canada (14.6%), Australia (13.3%) and the Netherlands (10.2%).

Mexico is the US's low cost supplier

The US imports about 60% of the volume of all globally traded asparagus and 49% of its value, with the vast bulk sourced from Mexico and Peru. The import volume of fresh and chilled asparagus from Mexico has climbed every year since 2015, reaching a new record in 2021 of nearly 197,000 tons, worth \$409 million. Mexico sends the bulk of its production to its neighbour, with zero tariff. Mexico also benefits from



@JohnBakker

A bulk bin (approx. 500 lb) harvested in Michigan for the processing market.

relatively simple logistics, due to its close proximity to the US, plus low labour costs, enabling a low average price of US\$2.71/kg. (It's thus no surprise the asparagus acreage is declining in adjacent California, where labour and other inputs cost much more and irrigation water is lacking.) Mexico's climate also allows it to harvest year-round with intensified supply between December-April, ahead of peak production in the US. Peru, meanwhile, shipped 102,000 tons of fresh asparagus worth \$333 million to the US last year. Smaller volumes come from countries including Canada, Ecuador and China. Over 2017-20, the average annual price for fresh or chilled asparagus imported by the US was \$2.68/kg. In 2020, the highest average import price (\$2.88) was in August, when supply is at its lowest and the volume from Mexico yet to climb, and the lowest prices (\$2.03 & \$2.06) were in March and April, when supply was at its peak. One insider says this year will require somewhat of a reckoning for the industry as most retailers are trying to lock in prices based on the last three years but production costs have increased so much that either prices rise or growers will leave. It will be a challenge to convince American consumers to pay the actual cost of asparagus production, but on the positive side, food service is back in full swing, and there is otherwise much optimism about the potential to get more Americans eating asparagus, and more often. *AW*

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Snapshot of Michigan's \$23 million asparagus industry

Michigan is one of the few places in the world where farmers don't use knives to harvest asparagus, they snap it off above the ground.

BY JULIE BUTLER [@FreshScribe](#)

Michigan's harvesting method harks back to the industry's origin in the US state as predominantly a supplier for the processing market. Today, 70% of its spears are sold fresh, with the small remainder going to processing, but the snapping continues. "In our advertising we tell shoppers, 'every bit you buy in the supermarket is edible'," said John Bakker, manager of the Michigan Asparagus Industry Research Farm. Typically the method means consumers waste less of the product when preparing to cook it than they might with knife-cut asparagus from say Mexico or Peru, he said.

Consumers like larger sizes for grilling

From its sandy loam soil, Michigan tends to produce 'standard' and 'large' size spears generally a little bigger than the ones shoppers mostly see from Mexico and Peru, which are the main foreign rivals during the usual 6-7 week Michigan asparagus season of around early May to the end of June. "We're seeing consumers accept and in many cases ask for spears that are a bit larger, and so harder to overcook. We've also seen huge growth in folks doing asparagus on barbecues, where thicker spears work well," Bakker said. Demand is also growing for asparagus that has been washed, trimmed and placed in plastic bags that can go right from the fridge to the microwave.

Zero tillage system favours spear quality

Around 100 farms grow most of Michigan's asparagus, which is mainly the mid-late season hybrid Guelph Millennium. They plant 1-year-old, ungraded crowns at a depth of 8-10 inches in trenches that are then partially covered and filled in through cultivation the first growing season. After the first growing season, the fields are levelled and that is the last time that they are cultivated for the life of the bed. Most fields receive an early fall application of field ryegrass which sprouts and begins growing under the fern canopy. The dead fern is chopped with a mower either late in the fall or very early



© John Bakker

Pickers, legs dangling off a cart, harvest the spears by snapping rather than cutting them, a method with its roots in a time when Michigan predominantly supplied the processing market.

spring prior to new spear emergence. The ryegrass, which survives the cold winter, greens and thickens in the spring and is killed off prior to spear emergence. The benefits of this no-till system is improved spear quality and reduced soil erosion. Oceana County, in West Michigan, claims to be "The Asparagus Capital of the Nation" and each year holds an asparagus festival which includes crowning of the Asparagus Queen.

Well-placed to serve both the east and west coasts

The vast majority of growers do not pack or process themselves but deliver their pick to one or two of the five or so larger entities that handle fresh packing (and who supply large supermarkets and food service), and to 1-2 processors. Michigan's production window overlaps those in Washington State, Ontario and New Jersey (which tends to have the earliest asparagus), but tends to start later and end later. (California is out of the market by the time Michigan starts.) The state's upper Midwestern US location gives it an edge in freight in that it is situated within 500 miles of half the US population. The lion's share of its production is consumed within the US via a mix of retail and food service sales.

Michigan's acreage stable as California's shrinks

Last year, adverse weather reduced production to about 20 million lb (≈25% for processing, 75% fresh) but this season a more normal outcome of 22-23 million lb is forecast, of which between 5-7 million would typically go to processing. (One canner and a couple of freezers are located in Michigan, providing a handy 'safety valve'.) Unlike California, where the harvested area of asparagus has shrunk by 2,100 acres since 2019 to just 2,800 (1,133 ha) in 2021, Michigan's has remained stable at around 9,200 (3,723 ha). Spears for the domestic fresh market are usually packed in 28 lb boxes of 1 lb (about 450 g) bundles, most of which have two rubber bands, though polypropylene sleeves are increasingly being used instead. Some 10 kg boxes, however, are prepared for customers who are used to buying imported shipments. **AW**

Michigan tells consumers every bit of the snapped asparagus they buy in the supermarket is edible.



© John Bakker

Los Gallombares sigue creciendo exponencialmente

La producción para el producto espárrago verde fresco de Los Gallombares, ha mostrado un crecimiento sostenido a lo largo de los años. “En esta campaña, esperamos mantener la línea de crecimiento exponencial que lleva la cooperativa, actualmente son 8 millones de kilos y tenemos previsión de llegar en torno al intervalo entre 9 y 10 millones de kilos.” dice María José García, Técnico de calidad, y explica que actualmente, la Cooperativa está inmersa en un nuevo proyecto, que culminará para finales del año 2022. Se trata de una nueva instalación industrial de 10.000 metros cuadrados, en la cual se quiere concentrar el mayor porcentaje de su producción, así como implantar las diferentes normas de calidad a las que se encuentran sujetos el resto de almacenes. En la actualidad, contamos con las certificaciones de GLOBALGAP/ GRASP y a finales de 2021 implementamos



la certificación IFS. “Vamos a invertir en maquinaria especializada en calibrar espárragos mediante un sistema óptico, esperando que 100% de las líneas de producción se adapten a este sistema y controlar de manera más homogénea el calibre y calidad del producto.”

Adicionalmente cabe destacar que en las nuevas instalaciones se trabajará alrededor de 120.000 kg de espárrago verde fresco cada 8 horas con la creación de empleo de más de 400 nuevos puestos y 11 líneas de trabajo.

Cada vez están más concienciados con el cuidado del medio ambiente conllevando a que la responsabilidad social corporativa en la que se encuentra la cooperativa inmersa hace que más del

70% de la producción utilice materiales biodegradables y reciclables, además de utilizar más del 63% de energía renovable gracias a las placas solares que la generan.

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En Perú: **El espárrago vuelve** a ser protagonista

La pandemia de la Covid-19 obligó a reformular los trabajos en las plantas de proceso.

Tras un 2020 complicado para el espárrago peruano, la industria volvió a sus cauces normales en 2021. Las producciones y ventas se recuperaron, teniendo a EE UU como su principal mercado. Si bien los números fueron mejores, la industria esparraguera sabe que, si el deseo es seguir creciendo, debe hacer frente a una serie de desafíos.

POR RODRIGO PIZARRO YÁÑEZ

En una época en que la agroindustria peruana alcanzaba los peaks productivos y de exportación más altos de toda su historia, la noticia de la pandemia de la Covid-19 cayó como un balde de agua fría en todas las zonas productoras del país, coincidiendo en muchos casos con un aumento de la oferta, que requería ser enviada a los mercados de destino para que no ocupase espacio en las bodegas. Unos de los cultivos que sufrió los embates de la pandemia fue el espárrago. La hortaliza que dio inicio, a mediados de los años ochenta del siglo pasado, a la actual y reluciente industria hortofrutícola de exportación del Perú, vivió más de un contratiempo en las campañas de 2020 y 2021.

Las producciones y envíos fueron yendo por un buen cauce

En los primeros meses de encierro e incertidumbre, hubo campos que perdieron cosechas de espárragos, principalmente porque había dificultades

ABSTRACT



Rodrigo Pizarro Yáñez, Periodista

The Covid-19 pandemic brought the Peruvian asparagus sector to a standstill for several months. Unlike in other countries, Peru harvests asparagus year-round. The lockdowns in 2020 hit the industry hard, with reduced shipments by air, a worker shortage and spiralling costs of key materials and supplies. By contrast, 2021 represented a year of recovery in terms of production and sales, although it is clear that the country's asparagus sector still has a series of challenges to overcome if it wishes to remain competitive.

en las plantas de empaque. Eso fue lo que ocurrió en algunas fincas de Ica, a unos 300 km al sur de Lima. Y si bien los responsables tenían claro que las plantas no iban a morir, esa producción se per-

dería y habría que esperar una nueva campaña, la del 2021, para ver nuevos resultados. En aquellos campos donde sí se pudo recoger los turiones, enfrentaron limitaciones de aforo en las plantas de empaque, que estaban trabajando entre un 60% y 70% de su capacidad, a pesar de que la agricultura había sido declarada como una actividad esencial en el país. Pero una vez que la hortaliza había sido empacada, se encontraron con un problema logístico, debido a las restricciones al tráfico aéreo, que hicieron tambalear a una hortaliza que, en fresco, se envía a EE UU, el principal mercado, bajo esta modalidad de transporte. Pero esos primeros meses la oferta de bodegas en vuelos había caído casi a un 60%. Por esos días, Europa tampoco era atendida y lo poco que se enviaba, estaba saliendo desde Miami, EE UU, tras haber viajado hasta allí vía aérea. Así, hubo empresas que estuvieron casi dos meses paradas, mismo tiempo que duró la cuarentena en el país, sobre todo porque más del 75% de las exportaciones de esta hortaliza se realiza vía aérea. A todo lo anterior, se sumó la escasez de mano de obra agrícola, porque los protocolos obligaban a trabajar con un porcentaje mínimo de trabajadores, pero además porque en Ica, la principal zona productiva, la Covid-19 golpeaba con fuerza, haciendo complicado encontrar colaboradores, sobre todo en época de cosecha. Sin embargo, una vez que se fue normalizando la situación, también las producciones y envíos fueron yendo por un buen cauce. Así, la campaña 2020, Perú la finalizó con envíos por un valor de 413 millones de euros, en todos los ➔



©Rodrigo Pizarro Yañez

Una vez finalizada la cuarentena, los trabajadores pudieron retomar las labores de cosecha.

Plagas más dañinas

La situación fitosanitaria poco y nada se parece a aquellos años en que se inició el cultivo. Hoy en día, si de plagas se trata, hay dos fenómenos claros en la industria esparraguera: han aparecido nuevas plagas o la presencia de otras se ha intensificado, aunque está claro que el principal reto fitosanitario del sector se llama *Prodioplosis longifila*, un pequeño insecto que habita en zonas costeras. Si bien los expertos han detectado ciertos errores en su manejo, han buscado nuevas estrategias de control, basadas sobre todo en un manejo integrado, técnica que se ha extendido en los campos del norte y sur del país, sobre todo debido a las restricciones que imponen los mercados de destino.

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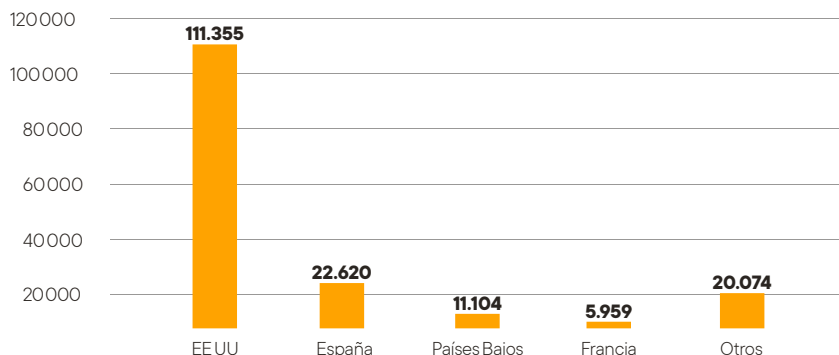
Con el reto de reencantar a los productores

Uno de ellos es volver a reencantar a los grandes productores con una hortaliza que ha ido cediendo terreno a cultivos más rentables. Esa ha sido una oportunidad que han sabido tomar los pequeños agricultores, sobre todo porque ello implica una menor inversión que, por ejemplo, aquella que se debe realizar un huerto de arándanos. A ello se añade la necesidad de la industria esparraguera de cumplir con todos los estándares de producción y de calidad que exigen los mercados de destino. Ello implica una necesaria mejora de los manejos agronómicos en diferentes zonas productoras. Así, arribó el 2021 como un año en el que la industria esparraguera debía recuperar el terreno perdido en 2020, haciendo frente a todos estos retos, aunque se añadió un nuevo 'problema': un aumento en el coste de los fletes aéreo y marítimo, que llegaron a multiplicarse por dos e incluso por tres, según señalaron diferentes fuentes de la industria. No fue el único inconveniente, ya que además los productores veían que se iba encareciendo el valor de los materiales y otros insumos clave para la producción de la hortaliza. La recuperación del espárrago llegó en un momento en el que otros cultivos, como la uva de mesa y los arándanos, batían récords productivos y de exportación, superando en ambos casos envíos por 880 millones de euros. En el caso del espárrago, en sus diferentes presentaciones, se exportaron 180.525 toneladas por un valor de 485 millones de euros, cifras que marcaron una clara recuperación del cultivo y que tuvo a EE UU como el principal mercado de destino (con un 63% de participación), con ventas que llegaron a 269 millones de euros, muy por delante del segundo mercado, España, que compró espárragos por un valor de 60 millones de euros.

El necesario recambio varietal y replante

Está claro que el espárrago peruano se ha ganado un sitio como un gran jugador a nivel global. Dio el gran salto cuando desplazó a las producciones chilenas y entró a competir de igual a igual con México, llevando sus producciones al vecino EE UU. Hoy México y Perú disputan quién es el principal exportador y, si bien los mexicanos tienen mejores ventajas comparativas, Perú ha sabido posicionar su producto. Para muchos, la clave para no perder la competitividad ganada es el recambio varietal, sobre todo porque la industria peruana ha basado su éxito en la variedad UC 157 F1, que desde un inicio supo adaptarse a las condiciones agroclimáticas de las dos principales zonas productoras del país (Ica y La Libertad). Se trata de la variedad que ha sustentado la industria, pero la escasez de semillas en el último tiempo ha llevado a los productores locales a sembrar otras variedades, como la UC 115 (DePaoli), un material vegetal que requiere de un manejo más fino, sobre todo en cuanto al riego, pero que bien manejado es posible obtener producciones entre un 20% y 30% más que la UC 157 F1, una variedad que es capaz de adaptarse a todo tipo de suelos. En cambio,

VOLUMEN DE EXPORTACIÓN POR MERCADO DE DESTINO EN 2021 (EN TONELADAS)



©Rodrigo Pizarro Yáñez

El espárrago peruano vivió momentos complicados en pandemia.

expertos del sector han podido comprobar que la UC 115 cuando ha sido instalada en suelos pesados, ha tenido problemas en su sistema radicular. Sin embargo, y a raíz de que la superficie de espárragos se ha ido reduciendo, son pocas las investigaciones que se han realizado sobre la adaptabilidad y manejo de las nuevas variedades de espárragos en el país, aunque la industria tiene claro que, para mantener la competitividad, el sector debe continuar con la exploración de las nuevas variedades, como si lo han hecho otras especies como la uva de mesa, donde se producen más de medio centenar de variedades. En cambio, en la industria esparraguera, el material vegetal se cuenta con los dedos de la mano. Si la renovación varietal no es posible, sí lo es la replantación, más aún cuando la vida útil de la esparraguera ha llegado a su fin. Esa es la estrategia que están siguiendo empresas del sector, que se está realizando de forma escalonada y que ha permitido a empresas agroexportadoras obtener rendimientos productivos promedio de 16 toneladas por hectárea. Asimismo, los pequeños productores también han estado renovando sus esparragueras, sobre todo aquellas que tienen más de 15 años. Esa es la oportunidad de obtener producciones más altas y de mejor calidad podrán vender a las grandes firmas del sector, y que estás seguirán colocando en los mercados más exigentes, sobre todo cuando en tiempos de pandemia los consumidores se han decantado por productos beneficiosos para la salud. **AW**

Caja con espárragos envasados.



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Une stabilité qui masque certaines évolutions

En France, la stabilité des surfaces ne doit pas masquer un léger développement de l'asperge dans le Sud-est et le Val de Loire. La tendance est aussi au bio même si son marché est moins dynamique, comme pour tous les autres fruits et légumes.

PAR GUY DUBON

Avec environ 5 000 ha, les surfaces françaises d'asperge restent relativement stables. La production est estimée à 20 000 tonnes. « *Les surfaces des membres de l'association sont légèrement inférieures à l'année dernière. Cela devrait se rattraper rapidement étant donné les prévisions de plantation 2022 en hausse de nos adhérents* », explique Astrid Étévenaux, directrice de l'AOP Asperges de France qui représente une surface de production de 1200 ha.

Le bio déploie des surfaces

Selon les observateurs, le développement des surfaces est en très légère augmentation. Sur la grande région du Sud-ouest, les nouvelles plantations vont permettre de renouveler les anciennes plantations avec +3 à 5 % de nouvelles plantations. Le développement le plus important va se faire dans le Sud-est de la France avec l'asperge verte et blanche et dans le Val de Loire particulièrement en bio. « *Dès l'année prochaine, les parcelles bio seront en pleine production et un quart de la production d'asperges sur les 850 tonnes produites sera AB* », précise Brahim El Hasnaoui, directeur commercial Fleuron d'Anjou. On peut aussi noter que 8 % de la production de l'AOP Asperges de France est prévue en bio. Mais c'est surtout une progression de 200 % par rapport à 2021. Plusieurs producteurs indépendants français, comme Les Fermes Larrère ou Frédéric Poupard, sont des spécialistes de l'asperge

ABSTRACT

A stability that masks certain evolutions

In France, the surface area is stable overall but there is slight growth in asparagus production in the South-East and the Loire Valley. The trend is also towards organic even if demand is not growing as fast as for other fruits and vegetables. Effort is also being focused on diversifying the product offering, such as with Priméale's ready-to-microwave bags of asparagus.

bio. Mais, comme pour d'autres fruits et légumes bio, la pomme par exemple, la valorisation des asperges bio en magasin pose question en 2022. « *Avec une baisse de la demande pour les fruits et légumes en général, la demande pour les produits bio fléchit* », explique Astrid Étévenaux. Cette tendance est en prolongement d'une baisse du marché du bio ressentie sur d'autres légumes d'hiver, comme le chou doux et la carotte, produits par les Fermes Larrère. L'entreprise propose un asperge verte bio précoce issue de son exploitation au Portugal et une asperge verte et blanche dans les Landes. « *S'il y a une légère baisse de l'engouement pour le bio, nous conservons un bon écoulement du produit avec la qualité et un marché partagé entre botte et vrac* », précise Patrick Larrère, directeur Fermes Larrère. Asperges de France vise à démocratiser l'asperge



**Fleuron
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VÉGÉTAL PAR NATURE

Asperges du Val de Loire, subtiles & savoureuses



© Fleuron d'Anjou

Un développement de surfaces d'asperge va se faire dans le Sud-est de la France avec l'asperge verte et blanche et dans le Val de Loire particulièrement en bio.

auprès du consommateur. Sur les quinze dernières années, l'asperge connaît une progression de sa consommation. Selon les données Kantar, les achats ont progressé de +22% et le nombre de ménages qui consomment de l'asperge de +19%. Des innovations en matière de conditionnement sont également favorables à la consommation de l'asperge.

De nouvelles facilités de consommation

Ainsi, Priméale lance les asperges minutes dans sa gamme Gourmet. « C'est un mix qui répond aux attentes des consommateurs. Il s'agit d'une sélection de pointe d'asperge calibre 20/30 origine France », explique Jasmine Vandamme, chef de Produits Marketing chez Priméale. Présentées dans un emballage spécial micro-onde, les asperges sont prêtes à consommer sans épluchage après 7 minutes de cuisson. Le sachet 250 g est prévu pour 2/3 personnes. L'asperge pelée est aussi une option parfois proposée en vente directe notamment en Alsace. Déjà développée en Allemagne et au Benelux, l'asperge pelée fait également partie de l'offre qui présente un intérêt croissant auprès des consommateurs (voir article page 72). En anticipation de la loi française AGECE, qui vise à interdire l'usage des emballages plastiques par unité consommateur de moins de 1,5 kg, certains opérateurs sont en quête de solutions. L'échéance pour l'asperge est fixée au 31/12/2024, mais Fruidor teste déjà certaines solutions pour commercialiser les 600 tonnes d'asperge de ses producteurs adhérents. « Actuellement, nous commercialisons en plateau vrac et en botte en réalisant aussi des essais avec des emballages en papier Craft, barquette carton... », mentionne Luc Ducquesnoy. « Les difficultés à surmonter sont le remplacement de l'élastique, encore en sursis dans la loi, mais aussi la tenue des emballages au rayon », fait remarquer le responsable du site de Fruidor Bordeaux terroirs dont le groupe est en veille d'innovations pour d'autres produits comme l'endive, la carotte. **AV**



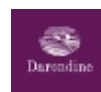
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Italy renews its plantations

Italy faces an uncertain asparagus campaign, with lower production but new plantations on the way.

BY LUCIANO TRENTINI

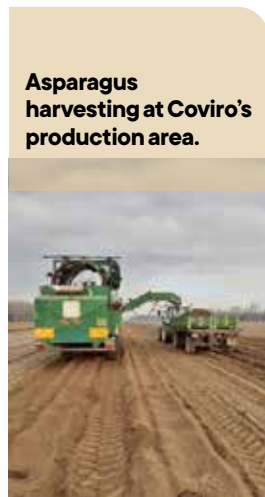
The harvest of green and white asparagus begins in February, with the greenhouses of Sicily the first to start, followed by the Naples area. At the end of the month, harvesting begins in central and northern Italy, where farms use a variety of techniques to heat the ground, such as geothermal water or hot water derived from alternative energies (wood chips or biogas), or they heat the roots with innovative systems using electricity. The past two years have seen a fall in production area, especially in the south, where most of the production is concentrated. This trend, which started in 2019, is primarily due to the pandemic and the consequent closure of stores and restaurants, but is also related to the problems of hiring pickers. Another factor is the climate, as producers have had to deal with spring frosts, droughts and extended periods of high temperatures (above the maximum tolerable level of 30°C). Phytosanitary problems have also affected productivity.

Diverse planting methods

In the first months of 2022, large and medium-sized asparagus producers have begun replacing old plants. The new production is destined for sale at public food markets and Italian and foreign retail chains. A portion of this production will also be directed towards the processing industry. Even small family-run farms are now beginning to grow asparagus to supplement



Production from new plants will be sent to general markets as well as Italian and foreign retailers.



Asparagus harvesting at Coviro's production area.

their incomes from other farming activities or are replacing species that are no longer economically viable. This production is mainly intended for direct sale at production sites or at local markets. In the last two years, the pandemic has certainly influenced the way consumers buy their asparagus, as they have turned more to online channels and also reduced the number of purchases they make and the overall quantity they buy. It is not easy to make precise estimates of the change in production area since planting methods vary from area to area in Italy. In northern Italy, farmers use one-year-old plants, while in the south of the country, farmers prefer to plant seedlings produced by specialised nurseries. Almost all of the nursery material comes from Italian nurseries authorised for production, some is also imported from Holland, France and Spain. At time of writing in March, the low temperatures and lack of rainfall are affecting availability and market prices are quite high for green and white asparagus of Italian origin. **AW**

Apofruit

increases PGI and organic production

Apofruit has doubled its asparagus production and strengthened both its organic and its PGI crops. "We are continuing to differentiate our production on a 50% PGI/50% organic basis. In

Romagna and the Bologna Plain, we grow green asparagus with integrated pest management systems, as well as the PGI Asparago Verde di Altedo, which, since last year, has seen renewed popularity among producers and consumers. In the south, in the Foggia area, we are focusing on our organics, with machine processing, at farms that are also Bio Suisse® and Naturland® certified in order to access foreign markets," said manager Ernesto Fornari. Apofruit also continues to invest in technologies such as heated greenhouses to enable increased production and an extended calendar. Overall production exceeded 1,000 tons in 2021, despite a delayed start to the campaign.



OPO Veneto

changes packaging and focuses on quality

OPO Veneto has changed the packaging of its asparagus and is increasingly focused on product quality. "Compared to a few years ago, we

have started to reduce the size of our traditional bunches, and we are now offering a new tray packaging with a more practical weight for family use. In our area, where asparagus growing is so important, white asparagus is undoubtedly the king, with three excellent products on offer – the PDO of Bassano, the PGI of Badoere and the PGI of Cimadolmo – and consumption of all of these varieties is rising rapidly. With costs rising, the clear challenge we now face is quality," said president Adriano Daminato. The past seasons have seen production damaged by adverse weather. Nevertheless, there is continued strong demand for white asparagus in northern Italy and in European markets such as Germany and Switzerland, where demand for an early product is often met through forcing techniques.



On the left, Adriano Daminato, president of OPO Veneto. On the right, Mauro Borgnera, vice president.

The **Bassano White Asparagus** means quality

Established in 2007, the Bassano White Asparagus PDO protects the production of excellent white asparagus in a specific area of north-western Veneto, where this type of cultivation has been present since the end of the 15th century.

BY GABRIELE ORSI

“**T**he Bassano White Asparagus PDO was created in a land that has always been ideal for producing a crop that is said to have originated right here. The peculiar characteristics of our asparagus derive from the fertile soil in which it evolved, thanks to the floods of the River Brenta. The soil is also very stony, and therefore rich in mineral salts, which give the product a particular taste when compared with white asparagus grown in sandy soils. The handmade packaging features a tie made of willow, which, together



© Consorzio Asparago Bianco di Bassano DOP

with our PDO seal depicting the ancient Alpini Bridge, makes it stand out in the market. Finally, there is always a tracking code to access data regarding the production period and the manufacturer,”

said PDO president Paolo Brotto. The White Asparagus of Bassano PDO is produced by about 50 companies, most of which are still family-run, spread across the ten municipalities of Bassano del Grappa, Cartigliano, Casola, Marostica, Mussolente, Pove del Grappa, Romano d'Ezzelino, Rosà, Rossano Veneto and Tezze sul Brenta, which annually place about 70 tons of PDO product on the market. The product is widely consumed locally, but also exported to the Far East, especially Japan, where about 10% of total exports are sent, and to a lesser extent to the UK. **AW**

COPA Canino

invests in new 100% plastic-free packaging

COPA Canino is focusing on more sustainable packaging while preparing for the final sprint in its efforts to obtain PGI certification for its asparagus. “The presentation and packaging of Canino’s asparagus are steadily moving towards total sustainability, with the elimination of all plastics, both in our traditional bunches, where polypropylene sleeves are replaced by paper ones, and in the trays, which are made of cardboard. This path was chosen above all to meet the demands of consumers and major retailers, who appreciate our adoption of plastic-free packaging,” said manager Giancarlo Benella. While the PGI request submitted to the Ministry of Agriculture is waiting to be forwarded to the European Commission, Canino’s asparagus continues to enjoy resounding success in the market, despite the spiralling production costs. Around 60% of the volume is destined for the Italian market, mainly wholesalers and supermarkets; ready-to-use solutions are supplied for the Ori del Lazio and Ori di Toscana lines of the Conad retail brand. The remaining 40% is sold to multiple foreign markets, including the UAE, to supply their food service channels, where the product is particularly popular.



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Spain eyes markets in Asia, Middle East

A new entity representing the Spanish asparagus sector's interest aims to work towards new export opportunities

BY JULIE BUTLER [@FreshScribe](#)

For the second year running, unseasonably cold weather and rain once again marred the February start of the green asparagus harvest in Spain this year. However, at time of writing in mid-April, there were signs of better weather ahead and thus hopes of the harvest rhythm increasing. Green accounts for the bulk of asparagus production in Spain and the annual average is now about 45 million tons. Almost all of it is grown in open fields, with only very small volumes in plastic tunnels, according to Antonio Zamora, president of Spain's new inter-professional organisation for green asparagus. Officially registered last year, this entity aims to protect and advance the interests of Spain's asparagus sector and has ambitious plans including opening up new markets beyond Europe. Zamora said the Interprofessional covers over 49,880 tons of production (over 80% of the national volume), with an annual sales value of over €80 million and 10,787 ha of planted area (87% of the Spanish total).

Spanish production generally stable

Green and white asparagus production in Spain is largely stable in terms of production volume and area but faces some challenges, Zamora said. The main production areas for green asparagus are in the regions of Andalusia (throughout, but about 5,500 ha are in Granada province alone), Extremadura, Castilla La Mancha (Guadalajara), and Madrid, while for white asparagus it's Extremadura (Badajoz), Navarra, La Rioja and Jaén. "There are some areas where the planted area may go down slightly in the next two years due to labour problems as well as the lack of profitability. We have to work on further developing automation in product handling processes and the digitalisation of companies and, of course, on costs in the field as well as on improving yields," Zamora said. Cooperatives in Andalusia,

Antonio Zamora, president of Spain's new interprofessional organisation for green asparagus.



@Centro Sur

“The asparagus harvest in Spain provides about 18,000 jobs.”

Asparagus from the PGI 'Espárrago de Huétor Tájar, the only PGI for green asparagus in Spain.



@Centro Sur



@Centro Sur

where many small farmers drop off their pick, handle around 3/4's of Spain's green asparagus crop and thus play an important role in helping maintain rural livelihoods. (The asparagus harvest in Spain is estimated to generate about 18,000 jobs.) "Asparagus is a relatively small sector compared to others in Spain and we need to work towards greater commercial concentration and a reduction in production costs, thus putting the sector on a stronger, more professional footing," he said. "We also need to carry out more field trials and consider other production methods so as to reduce costs and boost yields and quality," he added.

Eyes on expansion in Singapore, Hong Kong, Canada

Zamora said about 65% of Spain's green asparagus is destined for export, mostly to EU countries. However, in recent years, trade has opened up in the Middle East, Canada and Asia. "Spain has enjoyed access to the asparagus markets of Hong Kong, Singapore, Kuala Lumpur and Taiwan for about 2-3 years and we'd particularly like to develop these markets," he said. The inter-professional also aims to lift consumption, including domestically, particularly by promoting the qualities of Spain's green asparagus. This product is already well-known in many European countries and given it can reach such destinations by truck within just two days of harvest, it has the major advantage of freshness over imported rivals, plus a lower carbon impact than those air-freighted to Europe, Zamora said. Freshness is crucial because the main competitors are Peru, which is a year-round supplier, and Mexico, which overlaps with the start of the Spanish campaign, both of which have lower production costs. EU rivals during the Spanish season are Italy and the UK. Within Spain, consumption is slowly growing and more people are starting to try asparagus grilled or mixed in with scrambled eggs, for example. So far there does not seem to be great demand for products like microwave-ready bags, but Zamora predicts such demand will grow as Spanish consumers are also looking for fresh products offering both health and convenience. Asparagus consumption actually has a long history in Spain, having been kicked off by the Romans and with surviving recipes showing it was a prized ingredient in Al-Andalus cuisine. **AW**

* PGI: Protected Geographical Indication

Spain's asparagus PGIs*

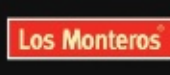
Espárrago de Huétor-Tájar PGI: **green-purple asparagus** Organoleptic profile: tender, fleshy and firm texture, delicate sweet-sour flavour and a deep aroma, reminiscent of wild green asparagus. Located in the western part of the province of Granada, in the lower alluvial plain of the Genil river. From select varieties indigenous to the area and growing at altitudes from 450-650m. Its gastronomic appeal makes it popular with restaurants.

Espárrago de Navarra PGI: **white asparagus** Grown in the central Ebro valley, the production area covers 263 municipalities in Navarre, Rioja and Aragon with the asparagus grown in clay or open clay soils in a continental climate with Mediterranean influence and mean temperatures of 13-14C. Varieties included are Argenteuil, Dariana, Desto, Cipres, Grolim, Juno, Steline and Thielim, for consumption fresh or preserved.

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The secrets to an **extra early asparagus season** in England



© Waitrose

At £3.50 for a 200 g bunch, upmarket supermarket chain Waitrose had early season UK asparagus in stores from Feb 26 – 8 weeks earlier than usual. (Holding the spears: New Forest Fruit technical director Grzesiek Putyra.)

Fruit growers often use clever ways to extend their season or make it start sooner and in the case of this British strawberry producer, that know-how is being transferred into earlier, tastier asparagus.

BY JULIE BUTLER [@FreshScribe](#)

New Forest Fruit's green asparagus spears were already in Waitrose stores from February 26 this year, about two months ahead of the usual mid-April kickoff for the UK asparagus season. This was partly due to a warmer start to 2022 and a unique microclimate in Hampshire, on England's 'sunnier' south coast. But CEO Sandy Booth explains that repurposing coir from his strawberry substrate in order to grow asparagus in raised beds, using microbiology to keep everything healthy, and a general tendency to challenge norms, are what give him an edge. "We're very innovative – we're always looking for the next best thing," he said.

No need for heating or bending to harvest

Booth started growing asparagus in 2014 as a trial, experimenting with different methods, inclu-

CEO Sandy Booth says New Forest Fruit's system may cost more, but means it harvests early and has normally finished by May 5, when others in Britain still have weeks to go.



© Duncan Booth

ding using soil mixed with coir and then coir only in plastic bins. But then he saw a grower in Holland using beds to grow white asparagus 80 cm above the ground, which for one thing saves pickers from having to bend over. This inspired him to apply a new method from 2018. Now, after coir substrate – made from coconut husks – has been used for two years to grow strawberries, it is put through a bio-chopper "to bring it back to life", then placed in asparagus beds about 80 cm high and 1.2 m wide. Because asparagus roots can reach a depth of up to 1.5 metres, they get a helping hand from the coir but still grow about a metre or so into the soil, Booth said. Furthermore, there's no need for heating. Just after skinning the tunnels, a 25 gm fleece is placed over the top of the beds, like another tunnel, and then a thin black polythene covers the bed until the spears pop through. Because the French tunnel metal is to the ground, it is quite low and heats up faster. Combined with the volume of coir used, which heats up faster than soil, the result is like a huge solar panel that raises the soil temperature

to up to 20°C. “There is no heating to achieve this, it’s all natural,” Booth said. After harvesting, the tunnel polythene is removed. “Yes, our system is more expensive, but it means we harvest early and have normally finished by May 5, when everyone else in Britain has still got 6 weeks to go,” Booth said.

Challenging conventions, including a doubling of the usual crowns/ha

A typical asparagus bed in the UK is 60 cm wide, planted with about 22,000 crowns/ha, resulting in about 8 plants per linear metre in soil, Booth said, but the respective figures for his 120 cm wide coir beds this year are 42,000 crowns/ha and 16 plants/m. His oldest crowns under his new system are now in their 4th season. They produced about 100 g of spears per crown in the first year, 200 g in the 2nd year and 300 g in 2021, the 3rd year. “We think 300 g per crown is the maximum we can expect in yield,” he said. New Forest Fruit expects a volume of 50-60 tons this year, after 30-40 tons last year. Most of the crowns come from Dutch plant breeder Thwan van Gennip and this year were mainly the Gijnlim variety but next year 65% will be Aspalim, “which is a bit earlier and has a nice flavour.”



@Duncan Booth

The coir beds are 120 cm wide and this year were planted with 42,000 crowns/ha, resulting in about 16 plants per linear metre.

“**The plants show no signs of disease, their nutrient uptake is higher, and the spears have excellent Brix levels of 7-8.**”

Using microbiology for the best possible compost

Grzesiek Putyra, New Forest Fruit’s technical director, said the firm uses microbiology to turn the coir into the richest possible compost. It thus aims to have the same spectrum of bacteria and fungi (like *Trichoderma*, *Mycorrhiza* and *Bacillus* family bacteria) as found in a healthy natural growing system. “We have special tools to measure the bacteria to fungi ratio, which is very important for asparagus, and also the carbon, organic matter and microbial biomass,” he said. Very old techniques are used to treat the soil, including use of earthworms. “While most commercial growers focus on soil applications of NPK (nitrogen, phosphorus and potassium), in addition we use humates and 3 different species of kelp in order to provide the plants with over 70 nutrients found in the ocean,” Putyra said. Last year was dedicated to reducing the usage of fungicides and pesticides and this year no pesticides are being used on the crop and also no nitrogen-based fertiliser, just biocontrol, and weeding is done manually. The farm is not organic (for reasons including that organic certification takes years and is currently based on soil growing media) but applies many organic techniques. Thanks to all these measures, the asparagus plants show no signs of disease, their nutrient uptake is higher, and the spears have excellent Brix levels of 7-8, where the industry average is around 4-6, Putyra said. *AW*



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Is **pre-peeled asparagus** becoming more popular?

There are signs that for white, and even green, asparagus, consumers are welcoming increased ability to buy fresh spears pre-peeled or to have them peeled at the point of sale.

BY JULIE BUTLER [@FreshScribe](#)

In Germany, a giant market for 'white gold', consumers like to buy freshly-picked spears direct from farm shops, where they usually have the option to have them peeled on-site after purchase. The latter is often also an option in the bigger German supermarkets, like Edeka, REWE, Real and Kaufland, where asparagus peeling machines may be found in the produce section, typically not for self-service but operated by a staff member who peels the customer's product selection. Though usually white asparagus, most of the machines can also peel green. Plus, pre-peeled white asparagus is available in some convenience stores, with popularity varying between regions, for instance selling better in east Germany and bigger cities than in the countryside and south/southeast, and overall accounting for a small share of total fresh asparagus on food retailers' shelves. Discounters, for example, usually don't sell peeled asparagus or sell only small amounts to test demand. Speaking of demand for peeled asparagus, is it growing only in the affluent, asparagus-loving German market? And what about in other major European markets?

The pandemic saw peeled asparagus used less in promotions

AMI, Germany's expert in agricultural market intelligence, says more and more consumers and caterers in Germany are buying peeled asparagus, though there are no concrete figures to measure this growth. Michael Koch, AMI's head of Horticulture, says this is largely due to the fact that consumers often buy asparagus unpeeled and have it peeled on the spot in the supermarket, at a sales stand or at the producer's. AMI thus analysed supermarket promotions for asparagus to see what kind of prominence, if any, they give to peeling. It found that in 2017, peeled asparagus accounted for about 5% of all promotional impulses for asparagus but in the last two years - marked by Covid-19 - less peeled asparagus was advertised. In 2021, for example, peeled asparagus accounted for under 2% of the advertising stimuli for asparagus. Though asparagus was represented 698 times in the advertising leaflets of German food retailers - 21% more than in 2020 - the number of promotions for peeled asparagus fell 25%. "This was the retailers' response to consumers having more time to prepare their meals and not relying so heavily on ready-to-cook products," Koch said. And though in general, peeled asparagus is rarely used as a promotional product in Germany, that doesn't



@BelOrta

Demand for pre-peeled asparagus is in line with a wider convenience trend witnessed by the expansion of fresh cut products, online grocery shopping and ultra-rapid delivery options, as busy consumers seek to save time.

mean it is not found on supermarket shelves, but that "it is an additional product during the asparagus season alongside unpeeled asparagus," he said.

Peeled is also popular in the Netherlands

As in Germany, peeled fresh asparagus is very popular in the Netherlands and Belgium, with the spears almost always peeled at suppliers' packhouses. Will Teeuwen, owner of Dutch asparagus grower and supplier Teboza: "About 10% of our sales in 2021 were peeled asparagus and we expect them to increase in 2022 because food service is fully open again." Teeuwen said supermarket sales of

peeled asparagus have been rising each year in both countries, with the growth rate particularly fast in stores that have only started to offer the peeled format in the last 3-4 years. Chains that have been doing so for about the last decade are still seeing growth, but at a slower pace. The pack volumes for supermarkets range from 350-700 g but the most

common size is 400 g. Teboza also supplies pre-peeled asparagus chunks ready for a stir-fry or soup. "We're trying to introduce new products every year to increase sales in the convenience area," he said. For restaurants, the standard size is 3.5 kg and, at the request of chefs, Teboza includes the peel in a separate bag on top of the pack. Food service demand is starting to pick up again after the lifting of Covid restrictions and though pre-peeled asparagus costs more, the industry realises it saves money by saving them time and prevents waste because the product has a much longer shelf life. The latter is thanks to the packaging, which is of a much higher quality than standard flow packs and also means the evaporation rate is much lower than in loose, 5 kg boxes. "Chefs can also reduce costs by buying

“ More and more growers are realising it is more profitable to cut green spears deeper and just peel the bottom 40% - the extra yield soon pays off. ”

HEPRO European sales development manager Lucas Klein

HEPRO says it sees a market trend towards peeling the lower part of green asparagus.



lower quality peeled asparagus, such as pink or purple, or bent or broken ones, they don't always have to have the best quality," Teeuwen said. Teboza uses HEPRO machines to peel its asparagus and in 2021 bought a new sealing machine which uses thinner material, thus reducing plastic waste.

Peeling more common at farmer markets in Belgium

Belgium's BelOrta cooperative says its white asparagus growers report that peeled asparagus is becoming more and more popular in their direct-to-consumer sales but this has not transferred to all supermarkets, where the volumes of pre-peeled asparagus are not that high. Peeling machines are found at most growers in Belgium, but not at stores, cooperatives or auctions, reports BelOrta leafy vegetables and vegetable crops expert Benny Cuyppers. Also, while pre-peeled asparagus had started to penetrate in food service, the closing of restaurants and switch from out-of-home to at-home asparagus consumption due to the pandemic in the last two years meant sales in that segment have remained stable but not grown further, he said.

Trends driving up demand for peeled asparagus, both white & green

German peeling machine company HEPRO GmbH says consumer demand for greater convenience and ready-to-cook foods is driving up sales of peeled asparagus. Pre-peeled white spears can save up to 15 minutes of work in the kitchen per kilo of asparagus, and, when correctly sealed in a material it has deve-



@Proseal

Peeled spears accounted for about 10% of Teboza's asparagus sales in 2021 and it expects to sell more in 2022 now food service is fully back.

veloped, have a ten-day shelf life as well as being easy to steam in a microwave, said HEPRO European sales development manager Lucas Klein. This applies not just to white asparagus, there's a trend towards peeling for green asparagus, too. Though green asparagus has traditionally been cut at a height that allows it to be eaten unpeeled, "more and more growers are realising it is more profitable to cut the spears deeper and just peel the bottom 40% - the extra yield soon pays off," Klein said. Another trend is the growing popularity of professional equipment based on the vertical peeling method, which HEPRO Ltd. CEO Christoph Wolter says is gradually overtaking the classic horizontal method, especially in Spain, France and Peru. A major factor in this shift is that in the current global context of rising labour, energy and other input costs, the vertical method delivers greater efficiency - the enhanced precision means there's no need for re-peeling, for example - and requires less staff to operate the machines. Klein said while the horizontal machines cut off up to a third of the valuable vegetable, the vertical ones eliminate only the 23-25% that needs to be removed due to bitter substances in the peel. Wolter said that in general, HEPRO is seeing such a high level of interest in large peeling machines that it plans to further expand its production capacities. *AW*

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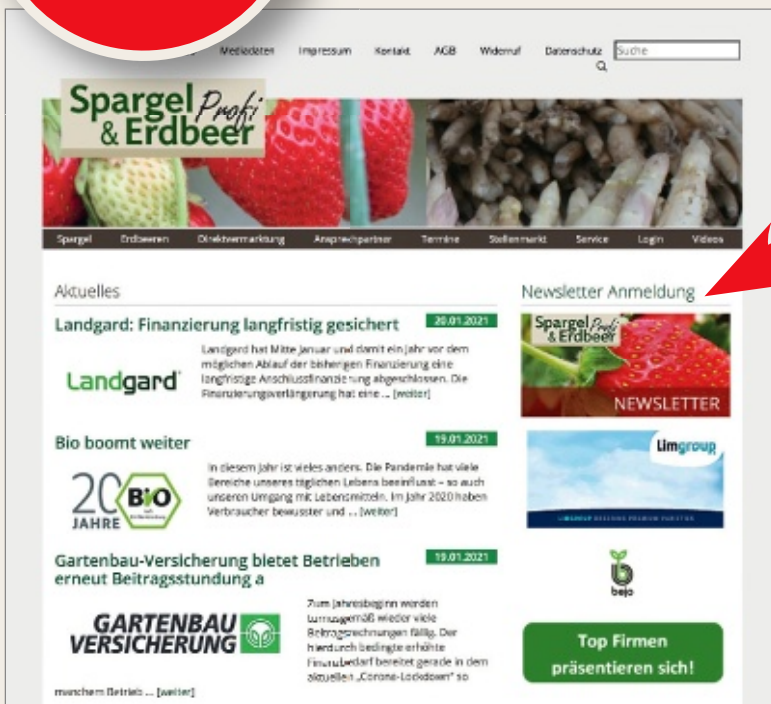
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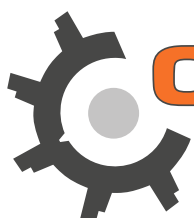


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