Asparagus World

THE 100% ASPARAGUS MAGAZINE

#3
YEAR 2021

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by Guy Dubon,
Co-editor of *Asparagus World*
and Editor of *Réussir Fruits & Légumes*

Cover:
AOP Asperges de France

Guy Dubon and Christian Befve, co-editors

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A step **towards the future**

In an inconstant world, change can take different forms. It can be synonymous with alteration, modification, transformation and variation. It can also mean moulting or metamorphosis, words that are closer to the living world and to agriculture. The evolution it imposes may be long, profound but also brutal, and even lead to destruction. Changes can be classified as either occurring within a system (type 1) or else affecting the system itself (type 2).

The changes presented in this new edition of Asparagus World are of both types. One that is inevitable is climate change, whose most visible manifestation is global warming. It affects the system itself, but in dealing with it, asparagus crops must find agronomic solutions within the system.

New technologies coming into agriculture are bringing about changes in agrarian systems from within, even though these technologies arrive from the outside. They link and connect agriculture and asparagus crops to information and digital technologies, robotics, space, etc. Data is becoming a new resource for dealing with future developments and advancing different scenarios. While various hypothetical futures can be predicted, prevention would seem a wiser option. So, adaptation that can allow for change is the only response in the present circumstances. In a world where everything is constantly changing, we need to anticipate the future.

NEWS

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MARKET

PORTFOLIO

International Asparagus Days returns to Italy

The next International Asparagus Days will take place from 7 to 9 September 2021 in Rimini, Italy, in association with Macfrut 2021. And there are already 4 good reasons to come and visit.

International Asparagus Days, IAD, is an international event dedicated to the entire asparagus industry. From production to marketing, through cultivation techniques, harvesting, and packaging, this meeting is aimed at all professionals of the sector. For the first time, IAD will be held simultaneously with Macfrut, the international fruit and vegetable fair, creating significant synergies and opportunities for exhibiting companies. All exhibitors who participate with a booth at the IAD fair in Rimini will also have a virtual booth available on the platform macfrutdigital.com in the Asparagus Pavilion, thereby expanding contact and business opportunities with operators from around the world. The show is organised in collaboration with the world's leading asparagus experts: Christian Befve and Luciano Trentini.

15th International Asparagus Symposium

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

The Asparagus Working Group of the International Society for Horticultural Science (ISHS) and the University of Córdoba (UCO) will organise the 15th International Asparagus Symposium to be held from June 12-15, 2022 in Córdoba, Spain. The event welcomes everyone engaged in research, teaching, growing, or public services related to asparagus cultivation and product quality. The 15th International Asparagus Symposium will be an ideal opportunity for attendees to share knowledge and information, and will include oral presentations, poster sessions, exhibitions, and seminar discussions. Post-symposium visits are planned to farms and research centres. The event will also offer the perfect chance to experience Córdoba and its culture.
Deadline for submitting abstracts: December 15, 2021 (online submission at https://www.ias2022.com/).

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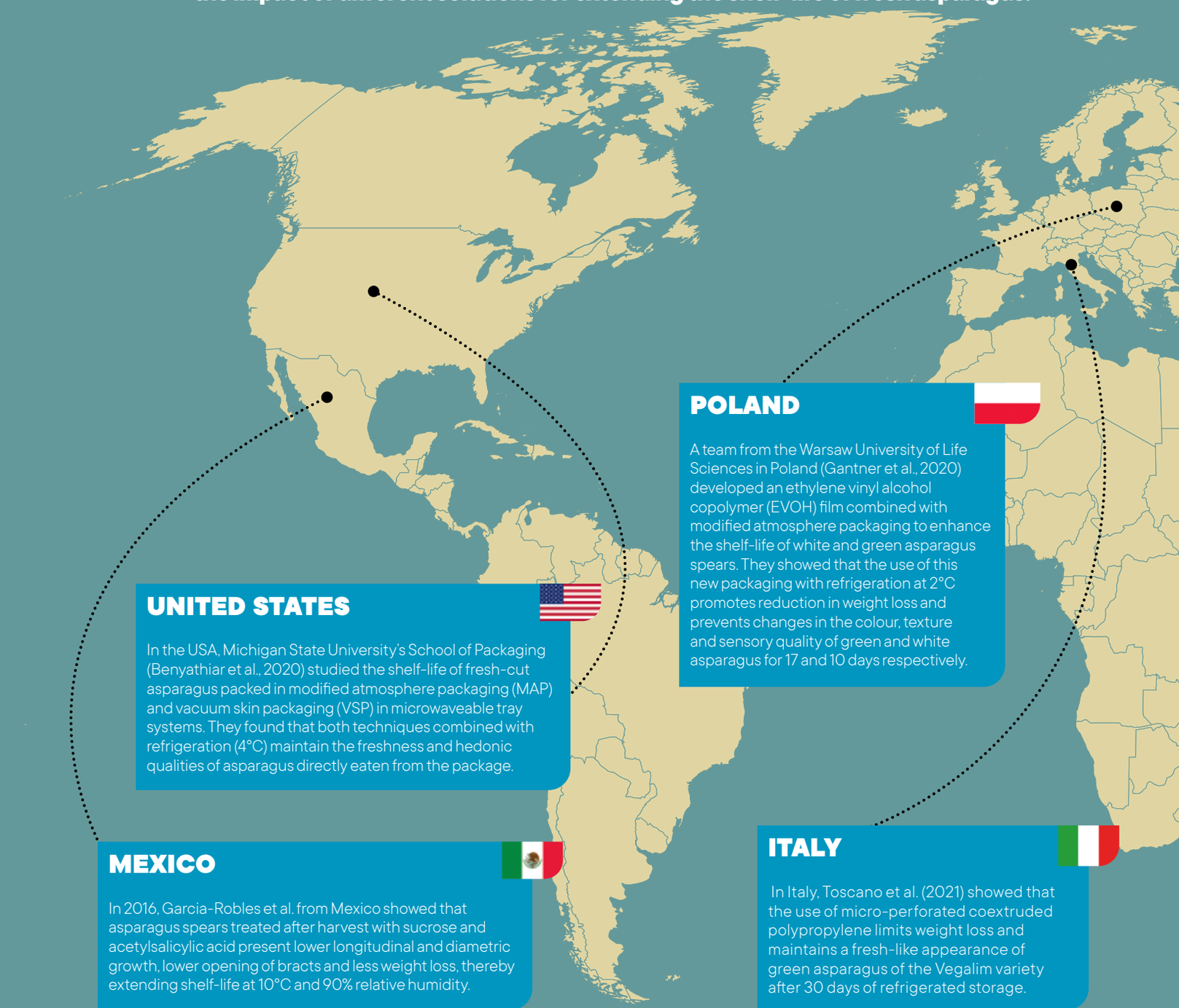
What's new in asparagus

The increased consumption and production of asparagus in recent times have heightened the need to extend the shelf-life for long-distance distribution. During storage, asparagus spear quality is reduced due to toughening, water loss and changes in biochemical compound content. Various physical methods have been studied to reduce these undesirable traits, like quick cooling, long-term refrigeration, and storage in a modified atmosphere. Packaging management is also known to play a key role in preserving asparagus quality. Various research programmes have been set up to study the impact of different solutions for extending the shelf-life of fresh asparagus.



POLAND

A team from the Warsaw University of Life Sciences in Poland (Gantner et al., 2020) developed an ethylene vinyl alcohol copolymer (EVOH) film combined with modified atmosphere packaging to enhance the shelf-life of white and green asparagus spears. They showed that the use of this new packaging with refrigeration at 2°C promotes reduction in weight loss and prevents changes in the colour, texture and sensory quality of green and white asparagus for 17 and 10 days respectively.

UNITED STATES

In the USA, Michigan State University's School of Packaging (Benyathiar et al., 2020) studied the shelf-life of fresh-cut asparagus packed in modified atmosphere packaging (MAP) and vacuum skin packaging (VSP) in microwaveable tray systems. They found that both techniques combined with refrigeration (4°C) maintain the freshness and hedonic qualities of asparagus directly eaten from the package.

MEXICO

In 2016, Garcia-Robles et al. from Mexico showed that asparagus spears treated after harvest with sucrose and acetylsalicylic acid present lower longitudinal and diametric growth, lower opening of bracts and less weight loss, thereby extending shelf-life at 10°C and 90% relative humidity.

ITALY

In Italy, Toscano et al. (2021) showed that the use of micro-perforated coextruded polypropylene limits weight loss and maintains a fresh-like appearance of green asparagus of the Vegalim variety after 30 days of refrigerated storage.

science?

CHINA

In China, Pu et al. (2020) demonstrated that high-oxygen modified atmosphere packaging maintains a tender texture, inhibits the increase of lignin content and delays the lignification process in green asparagus stored for 30 days.

SOUTH KOREA

In South Korea, a team from the Kangwon National University (Wang et al., 2020) showed that a 60% CO_2 treatment at 4°C for 48 hours in modified atmosphere packaging is capable of maintaining the post-harvest sensory and biological qualities of asparagus, and provides strong inhibition of microflora growth during the storage period.

VIETNAM

In Vietnam, Tran et al. (2020) showed that the use of a biofilm made of chitosan-alginate directly applied on the asparagus can be considered a new form of multi-component edible coating that allows very effective quality preservation and shelf-life extension.

THAILAND

A team from Thailand (Lwin et al., 2020) studied the effect of electrostatic atomised water particle (EAWP) treatment on the spear lignification and for maintaining asparagus quality. The results show that EAWP treatment maintains colour, reduces weight loss, and inhibits lignin and cellulose accumulation, leading to a better shelf-life of the asparagus during storage at 4°C.

By Julien Rocherieux,
Expert consultant
at Agrosome

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Climate change is expected to lead to global warming but also to a change in rainfall, with shortages and also excesses.

The major challenges of climate change

Climate change is now a reality that all farmers must consider, especially asparagus producers. It has implications for variety choice, planting techniques, and water management, right through to harvesting. Here are six suggested approaches to dealing with the challenges.

BY GUY DUBON @ReussirFL

According to a great many scientists, climate change is now an inevitable and irreversible phenomenon. Its most visible manifestation will be in the warming of the climate. This presents a huge challenge for agriculture, and therefore for asparagus production, too. Farmers must develop coping strategies in order to deal with the challenges of climate change. According to the sixth report of the Intergovernmental Panel on Climate Change (IPCC), one of the stated global goals in this regard is to limit warming to 1.5°C in order to give people and ecosystems more time to adapt. But there is an urgent need to take concrete action now.

Asparagus accumulates and "memorises" the effects of the climate

All living beings are affected by climate change, be they plants or animals. The impact on plant phenology was the first observed indicator of climate change. For example, many studies around the world found that "fruit species, which are often perennial species, are particularly exposed to climate impacts with multi-year and cumulative negative effects." In the case of the Golden Delicious apple tree, compared to the late 1980s, flowering now takes places an estimated 11 days earlier in northern Europe, as in the Rhineland (Germany), and 8 days earlier in Anjou (France). The same must be true for asparagus, a perennial plant that accumulates and "memorises" the effects of the climate (drought, heat wave, flood, etc.). This change directly affects crops as well as the development of pathogenic fungi and aggressor insects and their environment. In the Northern Hemisphere, bio-aggressors are moving northward at a rate of 26.6 km per decade, accord-

ing to a comprehensive 2013 study based on farmer accounts. These changes also affect the physiological needs of plants, such as the cold requirements of certain varieties of asparagus. According to the University of Chile, winters have lost 10-20 hours of cold each year in the country's Central Valley. The onset of the cold period has shifted from autumn to winter, making it less effective at triggering plant physiological processes. An increasing scarcity of water and rising temperatures associated with climate change are also noticeable in many areas.

Increasing demand for irrigation water

Water resource management is one of agriculture's key challenges. Prioritisation of water for human use, which ranges from "water rights" to speculation on its sale in cubic metres, is becoming ever more apparent in several parts of the world. These developments might lead to the displacement, relocation or even the abandoning of asparagus cultivation in some producing countries. According to the University of Chile, if temperatures rise by 20°C, which seems a likely scenario, the demand for irrigation water will increase by 12%. And the same is true in Peru, where these changes are also subject to the El Niño phenomenon. Major problems are also being posed by the extreme temperatures (above 45 °C), which some production areas are beginning to encounter very frequently, especially in the Mediterranean region. "In Catalonia, demand for water for perennial crops such as apples and stone fruit has increased by 20% in recent years. In addition, the mainly limestone, poor and shallow soils accentuate the effects of drought," said Robert Savé, a researcher at the IRTA (Institute of Agrifood Research and Technology).

In general, climate change also leads to excesses: wetter and colder springs, rising average temperatures, drier summers, extreme temperatures, more numerous and violent storm events. However, answers to some of these constraints and fears do in fact exist, as we will explain on the following page. *AW*

Climate change is leading to increases in extreme weather events and temperatures.

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6 ways to counter climate change

1 Change the varietal range

When establishing an asparagus plantation, it is necessary to reflect on the choice of varieties, as well as on the setting of the asparagus and its management, with particular attention to irrigation. The varieties are characterised by their different cold needs during their vegetative rest period. Colder areas or temperate climates, such as northern European countries (e.g. Germany, the Netherlands, France) and those in North America (US, Canada) require 1,000 hours of cold (under 7°C), while intermediate areas, i.e. with a Mediterranean climate (e.g. Spain, Italy, Middle East, California, Mexico, Australia) need between 500 and 600 hours, and hot zones or warm areas (e.g. Peru, Philippines) have no need for cold at all. It is likely that global warming in temperate zones will alter the current varietal range in Northern Europe and North America. The varieties chosen will be less demanding of cold in order to facilitate their annual storage and ensure an economically satisfactory lifespan. For green varieties in particular, an increasingly important criteria will be tip closure rather than flowering under the effects of heat. Improving the quality of the spear is currently a major goal for all breeders.

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2 High ridges to limit excess water

Even if average temperatures are likely to increase, the overall rainfall of some areas, especially in temperate climates, should remain stable. However, the precipitation regime could alter, with very heavy rainfall accumulations in autumn and winter. This consideration is driving interest in planting on ridges (see box). Ridge cropping is used to address water accumulation caused by very heavy rainfall, which could become increasingly more frequent. With this technique, planting is conducted at between 25 and 30 cm above ground level. Ridge cropping also allows natural drainage. Asparagus crowns are always found outside of the wet zone during wet and rainy winters or springs (see Asparagus World n°2/2020). A higher bed also results in more exposure, which leads to faster drying. Localised irrigation is a must in order to concentrate moisture at the foot of the plants. With this method, about 10% more input will be required on the row and per hectare. Another consideration is planting depth. Reducing depth also lowers the risks associated with excess moisture (asphyxiation, root diseases, etc.). Precocity can improve with faster soil warming: 1 cm less in planting depth = 1 day more precocity.

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3 Optimise irrigation

Irrigation provides new roots with moisture at the plateau level during harvest; this is mainly for green asparagus, but also for white. Each new spear produces 1 to 3 roots at its base. Close monitoring of root development is required to ensure constant humidity and allow the right humidity at depth. If these new roots are in drought, this will result in a lack of calibre, wrinkled spears, and loss of tip quality; in very harsh drought conditions, the spear can become completely dehydrated. On the other hand, supplying water ensures better calibres and yields and less flowering of the tip.

4 Culture Management

Sprinkling and shading can limit flowering and improve the quality of green asparagus. The spear contains more than 90% water and it is difficult to protect the skin from the aggression of the sun and wind and from too low hygrometry levels. In the greenhouse, two or three rounds of sprinkling during the hot hours maintains a humidity of above 80%, which is required to harvest a spear that is turgescent, un-wrinkled and of good calibre. Supplementing the moisture supply with sprinkling also lowers the ambient temperature.
Tall grass between the ridges creates a micro-climate, which reduces the risk of frosts and regulates the temperature by +1.5 degrees. The planting of long grass also reduces the effects of wind and prevents mulch from being blown away during storms.

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5 Night harvesting

Harvesting at night protects asparagus from the daytime effects of the sun and dehydration. Asparagus harvested at night is colder, whiter and less fibrous. Professionals practising this technique find that spears harvested at night are 10°C cooler than those harvested in the middle of the day. The cooling and storage process is facilitated during calibration and packaging. Asparagus harvested at night is also of better quality: it is straight, less fibrous, and has better calibre. Night harvesting often takes place in calm weather to avoid possible damage caused by the often dry wind to green asparagus, which bends. Indeed, wind affects the skin on the exposed side of the asparagus, and this invisible wound results in curvature.

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6 Put the asparagus under cover

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Like many other crops that suffer from increasingly frequent extreme weather (hail, high winds, intense rainfall, etc.), planting asparagus in greenhouses is an increasingly feasible practice. At the beginning of cultivation, greenhouses can regulate climatic jolts and bring more precocity, which often equates to better sales prices. The benefits depends on the structure (greenhouse, plastic) and the volume of the greenhouse (tunnel, multi-span).
Mini-tunnels (Engels type) provide three weeks of precocity compared to the open field and 20 to 30% more yield per hectare. Plastic tunnels, 5 to 9 m wide, provide 4 to 5 weeks of precocity and 30 to 50% more yield. Multi-span tunnels provide a gain of 5 to 7 weeks of precocity with 40 to 70% more yield per hectare. Yields are improved by the favourable conditions when growing in spring, but also by the longer vegetative period in the spring and autumn which increases the accumulation of reserves in the crown. Greenhouses also improve working conditions, making the harvest more comfortable and efficient thanks to the regularity and density of the spears to be harvested.
Today's new horticultural greenhouses equipped with photovoltaic panels mean that the benefits of sheltered production can be enjoyed for just a limited financial outlay. Investments in greenhouse structure are supported by energy-producing partners. However, in this type of greenhouse, the percentage of shade can be very important and become a limiting factor in terms of the precocity, productivity and longevity of the crop. Hence, the design of the sheltering structure is also crucial to its success.

Cultivating **plant cover**

As with many crops, the introduction of "plant cover" is becoming increasingly common with asparagus, as it provides organic matter and reduces weed problems.

BY GUY DUBON @ReussirFL

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Plant cover improves soil structure and is a source of organic matter.

The idea of combatting weed invasions by using other plants is beginning to spread in asparagus farming. Sown in combination with several species, such as common vetch, hairy vetch, oats, rye, faba beans, clover, etc., these plants are referred to as 'plant cover'. Plant cover helps limit weed development, improves soil structure and is a source of organic matter. This particular topic was the focus of the 4th technical day of the AOPn Asparagus of France congress (16/09/2020).

These plants improve soil structure

This 'plant cover' is only implanted in the in-between rows. Such controlled grassing makes for easier passage of machines and harvesters during harvest, especially in clayey soils. As they develop height, they create a micro-climate at the ridge level by reducing the effect of wind. The absence of wind prevents mulch from flying away and greatly reduces the number of twisted spears in green asparagus. Plant cover also has beneficial effects on compaction and water runoff, and therefore on soil erosion. According to French agronomic data, 60mm of rain in 30 minutes results in 68% runoff, and the loss of

Plant cover in testing

Since 2018, French cooperative Copadax has tested nine forms of inter-row plant cover for asparagus to assess their agronomic effects and weed control effectiveness. The cover is sown after ridge splitting (June-July); then, in some cases, it is pulverised in September/October and destroyed during pre-ridging at the beginning of winter. "The aim is to retain the three most interesting cover types and then make more detailed assessment of their level of recovery and return of organic matter and their impact on performance, which may not be negligible," said Christophe Labrouche, Copadax's technical manager. The results of the first few years have already shown the importance of vegetation cover density and soil humidity (even if it means watering), in order to successfully establish the vegetation cover.

1,120 kg of soil and 80 kg of organic matter per hectare. The presence of plant cover limits runoff to 6%, soil losses to 40kg and lost organic matter to 3kg. These plants also improve soil structure by bringing organic matter in the form of roots and vegetation after mowing. Their roots fragment the soil, facilitate water exchange and improve soil biodiversity. "The soil is a place where exchanges occur between air, water, minerals and organic matter, which is structured and organised by biological activity," said Maëlle Depriester, sustainable development councillor of Maine and Loire, underlining the importance of this environment. A living soil is a place of complex biodiversity that can contain billions of bacteria, millions of nematodes and mites, and metres of fungus mycelium per gram of earth, not to mention the multitudes of macrofauna in the form of earthworms, insects, etc.

Producing organic matter in the field

"By adding minerals, carbon and soluble sugars, plant cover provides raw materials for the humus, but, above all, it promotes synthesis," said Herminie Szitas, technical manager of Jouffray-Drillauda. Plant cover improves or maintains soil structure. It also represents two tons of dry matter, or about 600kg of young humus, per hectare. Its beneficial effects on the structure and life of the soil prepare the soil for new planting in the in-between rows, in the case of replanting. But plant cover is also a crop that needs planting, maintaining and protecting (see box).

Damien Violleau, head of asparagus growing, underlines just how far the possibilities extend: "You have to start de-compacting your head before de-compacting the ground," he said. Violleau, who is already practising agriculture in living soil, prefers to "produce organic matter directly in the field rather than bringing in compost. Having cover in place also reduces weed invasion, especially if you have successful removal and take care during planting." AW

Risk of competition and drops in yield

Plant cover is also a crop that needs irrigating and mowing to prevent the risk of competition with the asparagus.

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The risk of competition or reduced yields due to the presence of plant cover is very low or even non-existent as long as certain rules are followed. It is essential to be able to irrigate by locating water supplies through drip feed ducts or a ramp equipped with a drop hose system. The introduction of green manure is not recommended if the crop cannot be irrigated because this carries a risk of creating competition for water between asparagus and plant cover, which would penalise future yields.

Maintenance by regular mowing

The plant cover must not grow laterally and invade the mound. Hence, it is necessary to control it either via directed chemical weeding or mechanical weeding at the foot of the mound. From the end of July until autumn, the grass grows too tall. Its excessive development reduces the aeration of the crop and limits the entry of light, which promotes stemphillium and rust. Therefore, installing plant cover requires ensuring large gaps between rows, especially for white asparagus. The grass is planted at the end of July at a width of 50cm to reduce its potential for taking soil when ridging-up. Before sowing the vegetation cover, it is possible to bring soil back to the foot of the mound in order to make a reserve of soil for use during ridging. Maintenance is carried out through regular mowing. The number of passes is the same as for soil maintenance but it requires three times less diesel consumption than for soil work. AW

Production under solar panels

Producing asparagus in photovoltaic greenhouses presents opportunities that some French producers have already seized. The structure of the greenhouses, especially in terms of luminosity, is essential to their success.

BY GUY DUBON @ReussirFL

In France, photovoltaic (PV) greenhouses have appeared on the agricultural landscape in opportunistic fashion. When combined with agricultural activities, electricity production would appear a rather seductively virtuous solution. Many companies specialising in green energy production have offered partnerships to farmers (see box). There have been many attempts to grow crops under PV greenhouses, including with tomato, strawberry, raspberry, lettuces, etc. But capturing the light via photovoltaic panels and the shading this causes come at the expense of the luminosity available to the crops. "Our climate assessment and modelling work has shown a 46% decrease in light transmission under venlo-type PV greenhouses," said Christine Poncet of INRAE Sophia Agrobiotech during an event dedicated to this topic in 2018. However, this light transmission depends on the design of the greenhouse, its orientation, its surface area, the rate of occultation (the exposed part is usually facing south, or 50% of the roof) and the transparency of the photovoltaic panels.

© C. Befve

Asparagus is one of the crops offering interesting potential for production in photovoltaic greenhouses.

Problem-free harvest roll-out

Cultivation and technical itinerary are equally important factors in ensuring successful photovoltaic greenhouse production. Asparagus is a crop that offers great potential as its production cycle seems to be well suited to the particular conditions of photovoltaic greenhouses. In fact, in the spring, the production of spears does not depend on the brightness of the shelter. The sun's radiation alone can generate soil warming. At the end of harvest, the asparagus vegetation in the greenhouse receives enough brightness, which is at its maximum during the summer period. What's more, the protection PV greenhouses offer from rain and wind, as well as part shading and the delaying of the first frosts seem to favour the development of foliage and longer storage. This is why several French asparagus producers have already committed themselves to this form of farming.

Régis Serres produces green asparagus of remarkable straightness and high-tech quality

One such case is Régis Serres, a farmer in the Lauragais region (France). Today, he has a 10-hectare Reden Solar photovoltaic greenhouse park that is shared between asparagus and red kiwi production. He planted his first green asparagus in 2017. In the 2021 campaign, Régis Serres started the harvest on February 20th and had already harvested 2.5 tons by March 15th. As Serres explains, "Usually, the harvest runs from February 20 to May 25 and reaches about 4 tons per hectare. The harvest is spread out, with none of those production hits from the temperature variations that outside production is subject to." This technology also provides the highest-quality asparagus. The greenhouse's protected enclosure leads to a remarkably straight asparagus with excellent tip quality. "There is very little discarded at sorting - just 2%," said Serres. The regularity of production also facilitates the commercial development of this high-end product, which is very popular with restaurant owners, even if this year's pandemic has limited this segment of the market.

"Greater potential returns"

To obtain quality green asparagus, Régis Serres uses the Vitalim variety for its precocity and Grolim for its calibre. These varieties can obtain calibres of 16-22 mm and 22mm, respectively, as demanded by distributors. They are planted at a density of 10 plants per linear metre, in double rows, with an inter-row of 3.20m, or 35,000 plants per hectare. At the end of harvesting, the producer carries out light weeding and installs a drip irrigation system. The vegetation develops during the summer into four successive shoots that can reach up to 3m high. Serres plans to top the first shoot at a height of 1m to avoid the shedding of vegetation. During this period, the plants' health protection is limited to the use of an insecticide against aphids and asparagus beetle. There are no treatments used for foliage disease. The vegetation is halted by ceasing irrigation in early October, so that plants stop growing in mid-November, and the foliage turns yellow and dries out in December. The farmer grinds and removes the vegetation in mid-January. He then opens the greenhouse to allow the cold to plunge the crowns into vegetative rest for a few weeks. Régis Serres says that he is satisfied with his "production tool", even though he thinks there is a potential for higher yields, albeit with slower growth of the asparagus. The producer and his team of pickers also appreciate the working conditions offered by this protected space. The various grinding and tillage work is always done on time and in good conditions, without the constraints associated with working in external environments. The convenience offered at harvest time is also very much appreciated. In addition, consumers love his asparagus, which not only looks better, but tastes better too.

IN BRIEF

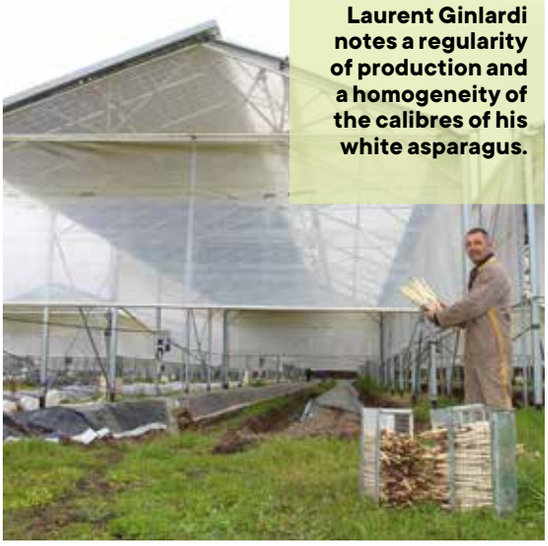
Transparent solar cells

Progress is also being made on developing transparent solar cells. Organic solar cells have a number of advantages. In transparent or semi-transparent form, they can be more flexible than other technologies as the wavelengths of light they capture can be adjusted. Researchers at North Carolina State University have grown lettuce under different wavelengths of light. In trials, the researchers have changed the ratio of red light to blue light received to mimic the wavelengths that would be blocked by transparent solar cells and have found that the plants develop very well.

Regularity and consistency of production

In the Landes region (France), Laurent Ginlardi also produces asparagus in a Mecojit photovoltaic greenhouse. He has 3 production sites of 2 ha. On two of his sites, the shelters are double-span greenhouses 2 x 6m wide and spaced 5m apart. This set-up allows for significant brightness. Light enters through the sides and the opening facilitates ventilation. In 2017, Ginlardi planted the Vitalim variety at 24,000 plants per hectare. Each span is planted with two rows 2.80m apart. The growing cycle is comparable to that employed by Serres, but Ginlardi has chosen to produce white asparagus, which means the mounds are covered with black/white plastic. By keeping the greenhouses closed in early spring, the producer gains 1 to 2 weeks of precocity compared to field crops grown under a small plastic tunnel. He is also seeing regularity of production and homogeneity of calibres, which is advantageous for direct sales of his asparagus in the region's

various markets. "However, there is a difference between the row of asparagus most exposed to the sun and the others. Water requirements are higher and the quality of asparagus is lower," said Ginlardi. In fact, he has observed a temperature variation of up to 10°C between the sunny side of the greenhouse and the shaded side. Ginlardi, who also has another 2-hectare multi-span photovoltaic greenhouse, admits he no longer wants to produce asparagus in the field. *AW*



Laurent Ginlardi notes a regularity of production and a homogeneity of the calibres of his white asparagus.

MORE INFO

Achieving brighter photovoltaic greenhouses

There are many types of photovoltaic greenhouses, and some poorly sized ones have too much shade. This penalises plant production and means that the structures are less productive. Faced with numerous failures, SDD Solar has developed a prototype photovoltaic greenhouse. Managers Philippe Dupouy and Hélène Dutrey said: "Our goal has been to make energy available to agriculture." Their 10 x 4.5m single-span greenhouse with channel was designed to achieve a compromise between power generation, brightness and ventilation. The photovoltaic panels are placed on the south side of 50% of the roof surface and achieve a light transmission of 20%. The rest of the cover is made of polycarbonate or glass. The sides of the greenhouse are closed using plastic films and insect-proof nets, thereby facilitating aeration and reducing the entry of pests. "The design of our greenhouses can be adapted to suit the crops envisaged. We want to be part of industry development projects alongside farmers," said the SDD Solar managers. As part of a contract partnership, SDD Solar provides the greenhouse for agricultural production. According to the company, greenhouse development projects are underway in asparagus, kiwi, berries and vegetable crops in south-western France and abroad.

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Die Blastunnel sind über sieben Spargeldämme mit einer Breite von 15 m gespannt. Verwendet wird eine 200 my starke Folie

© S. Tillemans

Die zahlreichen Stürme haben dafür gesorgt, dass die Blastunnel im zeitigen Frühjahr häufig abgelassen werden mussten – der damit verbundene Aufwand ist enorm

Spargelanbau im Blastunnel

Er ist ein positiv denkender Mensch. Erwin Tillemans aus dem niederländischen Panningen hat vor 22 Jahren mit Spargelanbau begonnen und gilt in dieser Region als einer der Pioniere für den Anbau im Blastunnel - einem Verfahren, das nicht für Menschen mit schwachen Nerven geeignet ist. Mit 23 ha Spargelfläche unter Blastunnel ist Erwin Tillemans mit Abstand der Branchenführer für dieses Anbausystem, dessen Vorzüge und Nachteile er im Laufe der Jahre zur Genüge kennengelernt hat.

BY THOMAS KÜHLWETTER

1998 ist Erwin Tillemans in den Spargelanbau eingestiegen, damals mit einer kleinen Fläche von 0,5 ha. 2001 wurde erstmalig ein Blastunnel errichtet, der sich dann gleich in der ersten Nacht verselbständigt hat und weggeflogen ist. 2004 wurde eine neue Hofstelle gebaut, 2008 ein neues Wohnhaus. Spargel ist heute die einzige Kultur im Betrieb, die Anbauflächen wurden permanent erweitert. Ging es über viele Jahre nur stetig bergauf, so hat Erwin Tillemans seit 2017 – ähnlich wie viele seiner Berufskollegen – festgestellt, dass die Wirtschaftlichkeit der Spargelproduktion deutlich gelitten hat. „2016 war noch ein gutes Jahr, aber die Banken haben ihn in diesem Jahr schon darauf hingewiesen, dass es langsamer in der Branche vorangehen wird und die Märkte gesättigt sind. Der Spargelbauer war zu diesem Zeitpunkt beeindruckt von dem guten Überblick, den die Banken damals schon hatten, denn über mehrere

Thomas Kühlwetter, Editor of Spargel & Erdbeer Profi

Asparagus under inflatable tunnels

In the Netherlands Erwin Tillemans produces 23 hectares of asparagus under inflatable tunnels. Each tunnel covers 7 rows of asparagus. The plastic film is lifted by the hot air thereby gaining precocity and also during the harvest period. It takes a lot of time to assemble and disassemble. When the wind is too strong, the tunnel is deflated.

Jahre waren zuvor beträchtliche GMO-Mittel in den Bereich geflossen, die zu erheblichen Anbauausweitungen geführt hatten".

Erwin Tillemans hat davon nicht partizipiert. Er vermarktet seinen Spargel frei. Im frühen Bereich, wenn im eigenen geheizten Gewächshaus oder unter Blastunnel geerntet wird, zählen auch einige Kunden in Deutschland zu seinen festen Abnehmern.

Zurück zum Anbau im Blastunnel, der in Panningen und Umgebung populär ist, obwohl immer mehr Anbauer - wenn sie eine Altersgrenze um die 60 Jahre erreicht haben - sich von diesem Kulturverfahren verabschieden: „Es ist doch alles ganz schön schwer und man muss unbedingt gute Nerven haben", erklärt Erwin Tillemans.

Wer im Blastunnel anbaut, muss die Wettervorhersage sehr gut im Blick haben. Wird z.B. für den Folgetag eine Windstärke von 6 oder noch darüber hinaus angesagt, muss der Tunnel abgelassen werden. Im Vorfeld muss die Anlage komplett gestochen werden, denn die aufliegende Folie würde die herauswachsenden Köpfe beschädigen und zu erheblichen Verlusten durch Abbrechen führen.

Gerade in diesem Jahr war das zeitige Frühjahr durch sehr viele Stürme geprägt und die Tunnel mussten häufig abgelassen werden. Liegt die Folie auf den Dämmen auf und es regnet, besteht die Gefahr, dass sich „Wassersäcke" bilden. Und diese zu entfernen, ist nicht immer einfach. Ist der Sturm passé, muss die Folie wieder aufgeblasen werden.

Das System mit dem Blastunnel hat im Betrieb von Erwin Tillemans über Jahre gut funktioniert, aber gerade in den jüngst zurückliegenden Jahren ist die Konkurrenz durch den Anbau unter Minitunnel groß geworden. In diesem Jahr 2020 konnte Erwin Tillemans am 27. Februar den ersten Spargel unter dem Blastunnel ernten. Knapp zwei Wochen später konnten schon bis zu 450 kg (und zum Teil noch darüber) an guten Tagen pro ha geerntet werden. Sortiert entspricht das einer Menge von ca. 380 kg Spargel. Doch die Schwankungen der Erntemengen sind zum Teil von Tag zu Tag beträchtlich. 70 Arbeitskräfte sind erforderlich, um die Ernte auf den insgesamt 23 ha Blastunnelflächen einzubringen. Die Temperaturführung im Tunnel ist schwierig, spätestens im April besteht die Gefahr, dass durch hohe Temperaturen immer mehr offene Köpfe gebildet werden. Eine Lösung besteht dann nur darin, die Tunnelfolie abzunehmen und in der Folgezeit entsprechend geringere Erträge zu erzielen.

Nicht nur die Installation der Tunnel, auch deren Abbau ist recht arbeitsaufwändig, auch wenn dies für Erwin Tillemans inzwischen zur Normalität geworden ist. Beim Abbau müssen die Folien, nachdem der Druck aus den Befestigungsschläuchen entwichen ist, aus den Gräben entnommen und aufgewickelt werden. Anschließend muss der Druckschlauch aus den Gräben entnommen werden, was jedoch insbesondere dann schwierig ist, wenn er stark verschmutzt ist. „Aber wenn der Sturm eine Minitunnelanlage durcheinander bringt, ist das auch mit viel Arbeit verbunden", sagt Erwin Tillemans.

In dieser Saison ist er bei der Ernte aus dem Blastunnel mit 12 €/kg für Doppel-A-Spargel gestartet. Unter dem Strich ist die Saison für den Blastunnel recht gut gelaufen, Preise und Mengen waren für den Anbauer aus Limburg akzeptabel. Die gesamte Umsetzung der erforderlichen Hygienemaßnahmen war jedoch auch mit wesentlich höherem Aufwand verbunden. Nachdem die Ernte im Blastunnel beendet war, sind die Preise in den Niederlanden deutlich in den Keller gegangen. Warum dies so ist, kann Erwin Tillemans sich kaum erklären, denn weder das Mengenaufkommen noch das Wetter, das über die Konsumfreudigkeit der Verbraucher entscheidet, haben nach seiner Meinung einen Anlass dazu geboten. *AW*

Wie funktioniert das Verfahren?

Zunächst wird um einem Bereich von sieben Reihen ein 60 cm tiefer Graben mit einer Kettenfräse gezogen. Im Anschluss daran wird die Folie ausgebreitet und mit ihren Rändern im Graben abgelegt. Im nächsten Schritt werden Schläuche im Graben abgelegt und mit Hilfe von Kompressoren soweit aufgepumpt, dass der Druck die Folie an den Seiten fixiert. Von der Frontseite wird Luft eingeblasen, sodass die Folie sich nach oben hebt und eine deutliche Erwärmung im Innenraum und damit auch eine Verfrühung der Spargelernte, ermöglicht.

© S. Tillemans

Über Ventilatoren wird ein Überdruck erzeugt und somit die Folien im Tunnel nach oben gehalten

Anticipare la raccolta dell'asparago **grazie all'energia elettrica**

Per soddisfare i consumatori ci si è dovuti affidare ad asparagiaie che sono riscaldate o con acque geotermiche o con acque calde da altre fonti rinnovabili o come nel caso di questa nuova esperienza che di seguito illustreremo riscaldando il terreno con il calore fornito dall'energia elettrica.

BY LUCIANO TRENTINI

In italia, nel 2021, gli asparagi verdi e bianchi precoci hanno subito un'impennata delle richieste per via di una serie di situazioni legate alla scarsa presenza di prodotto proveniente oltre che dal Sud America (Messico e Perù), anche dalla Spagna a causa dall'andamento climatico avverso caratterizzato da temperature fredde che di fatto hanno ritardato le raccolte in molte aree d'Europa.

Uno specifico cavo elettrico isolato

A Bosco Mesola, in Provincia di Ferrara, una zona molto vocata per la coltivazione dell'asparago in cui si coltiva l'Asparago Verde di Altedo IGP, Davide Zanellati, un giovane imprenditore, socio della Coop Casa Mesola, con la collaborazione agronomica dello scrivente e della ditta Ener Green di Piacenza che si è occupata della progettazione dell' impianto elettrico, ha realizzato nel 2020 una asparagiaia della superficie di poco inferiore a 1 ettaro dotata di un impianto di riscaldamento basale funzionante a corrente elettrica. Un secondo ettaro, sempre nella medesima azienda è in via di preparazione e il trapianto dell'asparago avverrà nell'aprile 2021. Per la coltivazione realizzata nel 2020 si è preferito distanziare le file a 3 metri ed è stata scelta una densità di circa 28.000 piante/ettaro. Questa asparagiaia dispone di un sistema di riscaldamento del terreno funzionante con l'ausilio di uno specifico cavo elettrico isolato posto alla profondità di circa 25 cm, che ha permesso di programmare la temperatura del suolo a livello dell'apparato radicale fra i 15 ed i 17 gradi, sufficienti, in questo 2021, per raccogliere e avviare la commercializzazione degli asparagi verdi a partire dai primissimi giorni di marzo, in linea con i tempi programmati. Per poter valutare l'efficienza dell'impianto, nonostante la giovane età dell'asparagiaia, si è optato per la raccolta già dal primo anno. Tenuto conto della situazione, si sono raccolti turioni per soli 20 giorni, dall'1° al 20 marzo, per evitare di stressare troppo la coltivazione. Ai fini di una valutazione agronomica e produttiva, sono state poste a dimora quattro cultivar: Verdus, Magnus Vitalim e Vittorio. Per questa prova che consideriamo innovativa, l'energia elettrica è stata fornita attraverso uno specifico contratto dalla rete pubblica distributrice.

Luciano Trentini, Asparagus consultant

Electric heating

In Italy, Bosco Mesola uses a specific insulated electrical cable to heat the soil to a depth of about 25 cm to have between 15 and 17 degrees at the root level. In 2021 its harvest of green asparagus began in the first days of March.

E' una tecnologia che può rientrare anche nei sistemi produttivi innovativi che possono utilizzare gli incentivi pubblici dell'agricoltura 4.0. Al momento naturalmente è presto per fare valutazioni economiche, visto che solo nei prossimi anni sarà possibile trarre conclusioni e fare valutazioni più precise circa i risultati produttivi e il mantenimento delle temperature a diverse condizioni ambientali rispetto a quella dell'inverno 2021 caratterizzato da temperature piuttosto basse e scarsa piovosità. Le esperienze maturate nella produzione dell'asparago riscaldato con acque calde ci hanno fornito comunque elementi significativi circa il risultato dell'attività in corso. Alla fine della raccolta programmata al 20 marzo sono stati raccolti 26 quintali di asparagi sulle 20.000 piante poste a dimora dei quali oltre il 70% erano di categoria extra. Per quanto

La posa in opera del cavo della Ener Green di Piacenza prima dell'impianto.

Davide Zanellati mostra l'impianto (distanza fra le file mt 3) ed il suo prodotto precoce pronto per essere commercializzato.

concerne la tecnica di coltivazione adottata al momento dell'accensione dell'impianto e della erogazione del calore, si è preferito coprire le file con un film biodegradabile per ridurre la dispersione del calore e contemporaneamente limitare al massimo la presenza delle erbe infestanti. Le file dell'asparago sono state ulteriormente ricoperte con un piccolo tunnel del tipo Nantese utilizzando un film trasparente termico dotato di tasche per facilitare la raccolta.

Energia elettrica fornita da fonti rinnovabili

Una prima sommaria valutazione sui costi di installazione di impianti come quello descritto, che si prevede possa avere una durata di circa 10 anni, ci consente di affermare che l'investimento per riscaldare 1 ettaro di asparagiaia sia dell'ordine dei 30-32.000 euro. E' evidente che per impianti di dimensioni maggiori si potranno avere economie di scala anche importanti. Nelle condizioni agronomiche descritte la potenza approssimativamente necessaria per il riscaldamento di quell'ettaro è di circa 70 kW. Non in tutte le condizioni di lavoro sarà necessario l'impiego dell'intera potenza nominale dell'impianto. I consumi giornalieri dipenderanno fortemente dalle condizioni climatiche in cui il sistema si trova a operare e cioè dalla scelta di coltivare in file singole o binate, dalla zona climatica in cui si realizzerà l'impianto, dalla tipologia di terreno e dalle tecniche colturali adottate che potranno incidere in modo significativo sulla potenza necessaria. Ugualmente il costo dell'energia può avere prezzi diversi se questa viene fornita da rete pubblica od ottenuta da fonti rinnovabili quali il fotovoltaico o altro. Una prima sintetica analisi nella situazione descritta e per l'annata in corso in cui si è operato in questo 2020/21 ci fa pensare che il costo per Kg di asparagi verdi raccolti e commercializzati nel periodo che va dal 20 febbraio al 20 aprile, possa variare da 5,5 €/kg nel caso di una produzione di circa 6 tonnellate/ettaro per scendere a 4 €/kg nel caso in cui la produzione raggiunga le 9 tonnellate/ettaro. I valori calcolati e stimati, comprendono le quote di ammortamento per l'impianto dell'asparagiaia, l'ammortamento dell'impianto elettrico riscaldante, delle spese per il collegamento alla linea pubblica di erogazione dell'energia elettrica, delle spese di gestione dell'asparagiaia (concimazione, irrigazione, manodopera, etc). Essendo l'impianto gestito in coltivazione diretta dal titolare dell'azienda sono state escluse dal calcolo le spese per i costi figurativi quali il del prezzo d'uso del capitale fondiario, gli interessi per l'uso delle macchine e attrezzature e del capitale di anticipazione.

Maggiori informazioni a Macfrut 2021

Naturalmente, come preannunciato, nel momento in cui è stato redatto questo articolo non è ancora stato possibile avere informazioni più precise su alcune delle spese e dei ricavi e quindi siamo ricorsi a dati certi e stime. Tenuto conto della situazione commerciale di questo 2021 in cui l'andamento di mercato dell'asparago è stato attivo, il bilancio è da considerarsi positivo. I lati positivi di questo sistema sono sicuramente da ricercare nella facilità d'uso, nei bassissimi costi di manutenzione dell'impianto, nella elevata affidabilità e sicurezza di erogazione dell'energia elettrica. Per il 2022, con l'obiettivo di affinare la tecnica dell'uso di questa fonte di calore e continuare le valutazioni agronomiche ed economiche, con molta probabilità disporremo oltre al nuovo impianto, di una serra coltivata ad asparagi con copertura fotovoltaica la cui energia prodotti servirà anche per l'alimentazione dei cavi riscaldanti. Gli asparagicoltori dei diversi Paesi produttori che intendono valutare questa tecnica dovranno fare i conti con i costi sostenuti nei loro paesi. I dati economici evidenziati fanno riferimento ai dati e costi in Emilia-Romagna In occasione di IAD International Asparagus Days che si terrà a settembre in concomitanza di Macfrut 2021 sarà possibile avere maggiori informazioni in merito. AW

10 marzo 2021. Cv Vitalim in fase di raccolta . Fino al momento della raccolta, per impedire la fuoriuscita delle malerbe e per mantenere il calore, la coltivazione è stata pacciamata con film biodegradabile. La coltura è protetta da un piccolo tunnel.

MORE INFO

La Rosa anticipa la campagna grazie alle colture riscaldate

La Rosa anticipa come sempre la propria campagna degli asparagi bianchi grazie alle particolari tecniche di riscaldamento adottate in campo: "In buona sostanza le nostre coltivazioni sono servite da un impianto alimentato ad acqua calda, proveniente dalle nostre zone termali, che riscalda il terreno sottostante consentendoci di anticipare il raccolto di quasi un mese. Infatti generalmente alla fine di febbraio abbiamo già le prime produzioni di asparago bianco, tipico delle nostre terre, anche se questa stagione sta iniziando più lentamente del solito" spiega il titolare Paolo Queruli. La partenza rallentata è da attribuirsi alle basse temperature invernali, che al momento non garantiscono una grande disponibilità di prodotto, un problema compensato ampiamente da un'elevata qualità. Una produzione che trova nell'Italia e nella Germania i propri mercati di riferimento.

Taking risks with **organic asparagus**

As the organic market develops, so does demand for organic asparagus. However, organic production imposes more constraints and is riskier than conventional farming.

BY DIDIER DUPRAT

As with all other vegetables, the production and consumption of organic asparagus is growing all over the world, especially in the European market, which is experiencing particularly strong growth in this segment. The development of surface areas has accelerated over the last 5 years, as farmers convert to organic agriculture. However, as seen in other vegetable crops, there is a wide range of asparagus growing areas, from one hectare for some producers to a hundred hectares for large farms.

Tested and developed by organic producers

For the vast majority of asparagus producers, their practices of organic farming are motivated by their beliefs and commitment to the environment and consumer health. But the growing market opportunities and the value of organic products are also factors (see box). Nevertheless, there are also many obstacles to production. There is a certain level of risk-taking in organic farming, especially in protecting crops against diseases and pests, and there is no margin for error. Anticipation and prevention are the keys to a successful organic asparagus crop. Organic asparagus producers are also pioneering new techniques, which are sometimes taken up by conventional (non-organic) producers to eliminate phytosanitary treatments. One such example is the burning of weeds to avoid using herbicides. Organic degradable plastic mulch is also used to prevent competition from weeds. Similarly, the generalised use of drip feed ducted irrigation is aimed at reducing water consumption and limiting the spread of weeds. New soil-working equipment, such as rotating brushes to destroy weeds at the foot of asparagus, are also being tested and developed by organic producers (see box).

Benefits and Constraints of Organic Culture

The pluses

- Personal benefits (production philosophy, respect for the land and life)
- Financial benefits (€1.5–€2 more per kg for the producer)
- Responding to strong consumer demand
- Pioneering production techniques

The minuses

- The lack of synthetic treatments forces farmers to anticipate all kinds of crop problems, such as fungal problems, pest attacks and weed control.
- Although nurseries are making efforts to quickly increase the supply, there is currently a lack of availability of organic plants both in terms of the quantity of crowns and varietal diversity.
- Strong tensions between the availability and price of inputs, especially organic matter.

Biodegradable films and mechanical weeding help control weeds.

Plant crop in good conditions

The ban on synthetic chemicals has required research into other means of pest and disease control. The use of auxiliaries such as nematodes to control asparagus beetle larvae is one line of development. Commercial biocontrol solutions and elicitors are also being put in place to protect crops. In addition to technical solutions, organic farming also calls for more monitoring of the plots and more correlation between the different leavers of production: varietal choice, crop implantation, fertilisation, irrigation, etc. (see AW No. 2) so as to plant the crop in the most favourable growing conditions and limit the risk of diseases and pests. For some producers, organic farming serves as a stepping stone in the transition to biodynamic agriculture (see Asparagus World No.1). *AW*

Organic agriculture in Europe

The European Union's organic agricultural production area grew by 6.0% in 2017 and by 7.6% in 2018, when it surpassed 13.8 million hectares. Organics accounted for about 7.5% of Europe's agricultural area in 2018 (compared to 7.2% in 2017), when over 300,000 farms were involved in the practice. Overall, the EU's organic production area more than tripled between 2000 and 2018. Spain has the largest organic area and Austria has the highest share of its agricultural territory. Consumption of organic products is estimated to be worth more than €40 billion. In value terms, 68% of the EU's organic consumption is accounted for by four countries: Germany, France, Italy and Sweden.

Didier Duprat,
Asparagus consultant

To successfully reduce the risks of frost damage, a mix of passive and active measures must be used. Active measures might involve irrigation.

Don't freeze in the face of late frosts!

Since ancient times, the appearance of asparagus has symbolised the arrival of spring. But asparagus growers in more northern regions often have to deal with the last throes of winter as the harvest starts. As the larger spears tend to emerge early in the season, losses affect both quantity and quality. Without a well-planned strategy for ensuring frost protection, the first harvests of the season can turn into a real management nightmare.

BY AMÉLIE LACHAPELLE

Amélie Lachapelle,
Asparagus consultant

It has been well established that frost damage occurs when ice forms inside plant cells. According to research, at a temperature of -2.8˚C, around 50% of asparagus spears show damage (Arora & Wisniewski). To successfully reduce the risks of frost damage, a mix of passive and active measures must be used. Passive measures might include the choice of the site of the asparagus field, the varieties used based on their earliness and techniques that delay the emergence of the spears. Active measures might involve irrigation, wind machines and crop covers to conserve heat, add heat and mix in warmer air.

First and foremost, before engaging in crop protection against frost, we have to ask whether it is in fact worth it because, depending on the type of frost, your efforts might all be in vain. When a radiation frost hits, there is no wind (under 8 km/h), the sky is clear, and the layer of cold air is only about 10 to 60 metres high. Under such conditions, if we can achieve thermal inversion, the frost protection will be effective. But when winds are stronger, the sky is cloudy and the layer of cold air is 150 to 1,500 metres above ground level, we are facing advection frost, which is much more difficult to protect against. Also, when using irrigation as protection, we must be aware of the dew point. Why is it important to know about the dew point? Because the greater the difference between the air temperature and the dew point temperature, the drier the air is. The drier the air, the more the irrigation water will evaporate. When water evaporates, it absorbs heat and cools the air around the shoots. Thus, when the air is drier (has a lower relative humidity) and/or the wind is greater, more litres of water per hectare are needed and the irrigation should be started earlier and at a higher temperature. Sufficient water

TEMPERATURE AT WHICH IT IS RECOMMENDED TO START IRRIGATION, BASED ON THE DEW POINT

Dew point	Air temperature
–1.1°C	**0° C**
–1.7° C	**0.5° C**
–2.8° C	**1.1° C**
–3.8° C	**1.6° C**
–4.4° C	**2.7° C**
–5.5° C	**3.3° C**
–6.7° C	**3.8° C**
–8.3° C	**4.4° C**

volumes are also necessary. Insufficient irrigation can do more damage than not irrigating at all in some cases. Remember that irrigation should be maintained continuously until the ice begins to melt or when the crop is receiving direct rays from the sun.

The use of protection covers can provide crops with temperatures that are up to 6°C or more above the outdoor temperature, depending on the manufacturer. Hoops are needed to protect the tips. Depending on the labour force and the acreage to cover on the farm, this might be a worthwhile strategy to consider. Another good option is the use of wind machines, which can cover 3 to 5 hectares, depending on the topography. But keep in mind that they become useless with winds of over 7 km/h or in cases of advection frost.

Another alternative worth considering is irrigating the morning before a light frost, as moist soil absorbs heat better. At night, the accumulated heat will rise towards the surface and the plant canopy. Make sure that the first 10-15 cm of soil is moistened. This method will work better if performed on a sunny day on bare soil. However, you should bear in mind that this method might save only the shorter spears, but it may represent a good option where water supply is insufficient or acreage is too large for protection with nighttime irrigation.

If, despite everything, the asparagus suffers frost damage, there will often be a delay before the crown develops new spears, leading to delays in the harvest schedule. Removal of the damaged spears from the field usually helps to shorten this gap and return to a bountiful harvest more quickly. AW

Winterhardiness in Asparagus

Asparagus cultivars bred in different climatic zones may not be broadly adapted. For example, UC157, developed in the mild winters of California, dies after a few years of cultivation in Canada, where air and soil temperatures of -20 and -5°C, respectively, are common. However, the Canadian-bred cultivar Guelph Millennium survives these conditions with high sustained yields. Studies in our research group comparing cultivars with varying adaptation to the Canadian winter suggest that survival can be related to the timing of dormancy induction and acquisition of freezing tolerance in the autumn, as well as the timing of dormancy release with the loss of freezing tolerance in the spring. Subjecting crowns dug sequentially in the autumn and spring to controlled freezing temperatures allowed an estimation of LT50, or the temperature at which 50% of plants die, an indicator of freezing tolerance. Compared to UC157, Guelph Millennium acquired freezing tolerance earlier in the au-

The delay in dormancy acquisition and senescence in the fall may make fern vulnerable to early frosts.

5 possibilities to manage late Spring Frost in Ontario

Southern Ontario is home to a small but rapidly expanding and relatively successful asparagus industry. Spears typically emerge in the last week of April and harvest normally gets underway in the first week of May. But this raises significant issues given that this region almost always experiences one or more frosts before the end of May. So, how do growers deal with these frost events?

1 Water proximity: Southern Ontario's asparagus production region is widely bordered by 3 of the Great Lakes. This fact alone provides a moderating effect on temperatures and reduces the likelihood of lethal frosts. So, planting fields closer to these (or other) bodies of water can provide significant benefits. During frost events, temperatures can be 3–4 degrees warmer in fields that are within 2–3km of a lake than in fields further inland.

2 Field location: Higher portions of a rolling field will always be less prone to frosts than those in lower areas where the cold air drains into.

3 Use of an overwintering cover crop: Many of Ontario's asparagus fields are autumn-planted to cereal rye. Besides the reduction in erosion and the benefits to the soil, this cover crop acts to slow the warming up of the ground in the spring and thus delays spear emergence. (There is limited benefit to attempting to hit early local markets given that they are usually flooded with very cheap Mexican imports during the start of our season.) Delayed emergence means a reduction in crop exposure to a killing frost.

4 Use of mulch: We are currently experimenting with the use of a straw mulch which we place over the top of plants early in the spring. Similar to the use of the rye cover crop, the straw acts as an insulating blanket and keeps the ground from warming up, thus delaying emergence.

5 Varietal selection: Due to the relatively cold and hard winters in Ontario, there are virtually no differences in terms of emergence between varieties from various asparagus breeding programmes. Nevertheless, Fox Seeds is currently investigating varieties that can produce a larger proportion of total spears later in the season to avoid the significant impact of an early frost and to offer growers a more even production profile.

tumn, and maintained freezing tolerance later in the spring. Interestingly, the fern of Guelph Millennium also senesced earlier in the autumn than that of UC 157. Differences in LT50 values were correlated with levels of metabolites in the crown, known to affect the freezing of cells, and the rhizome appeared to be more vulnerable to damage than the storage roots.
Both cultivars had similarly high levels of freezing tolerance in late autumn and early spring, suggesting they may be equally capable of surviving during the coldest periods of winter. Due to the technical difficulties of digging crowns from frozen soil in mid-winter, LT50 values have not been estimated and cultivar difference during this period cannot be fully discounted.

Why does an unadapted cultivar such as UC157 not survive well in Canada?

The delay in dormancy acquisition and senescence in the autumn may make ferns vulnerable to early frosts. In turn, this could disrupt the reallocation of metabolites to the crown, which is vital for plant health and vigour. Most significantly, early loss of freezing tolerance in the spring can increase susceptibility to damage from subsequent freeze-thaw cycles, which are common in Canada. UC157 steadily lost freezing tolerance once the soil thawed, while Guelph Millennium maintained high levels for several weeks. The timing of dormancy release can be related to a critical trigger temperature. UC157 may respond to cool soil in early spring, while several weeks of soil warming appear necessary to affect Guelph Millennium.
Cultivar selection is an important decision for growers. Caution is necessary when considering cultivars bred in different regions. So, it is crucial to obtain trial data over multiple seasons, especially in cold climates, to account for erratic annual variations. *AW*

DAVID WOLYN

Dr Daniel Brainard at MSU

EXPERT TESTIMONY

Effects of Rye on Emergence in Michigan

Through a grant supported by the Michigan Asparagus Research Board, scientists at Michigan State University (MSU) have been working with commercial asparagus growers on the sandy soils of west Michigan to evaluate the effects of winter rye (Secale cereale) on soil temperature and spear emergence. In Michigan, rye is commonly broadcast into senescing fern in the autumn and allowed to grow in early spring to protect soils and reduce wind abrasion of spears. Some growers let rye grow as long as possible in the spring in the hope of delaying emergence, avoiding potential frost damage and allowing more time for picking crews to make their way to Michigan. To better understand the impact of rye on spear emergence, the MSU team, led by Dan Brainard, set up field experiments on a grower's farm, comparing soil temperature and spear emergence in plots terminated as early as possible in the spring (mid-April) versus those where rye was allowed to grow as late as possible (early-May). In both years of the experiment, they found that delayed termination of rye lowered peak soil temperatures by 1–2°C and delayed spear emergence by 1–3 days. By early-May, when the chance of a late killing-frost is about 25%, 10–15,000 fewer spears per hectare had emerged in the late-killed rye plots. By late-May, when risk of frost is minimal in Michigan, total spear emergence was the same in both treatments. The team is also evaluating the effects of plastic mulch on spear emergence, and using data from these experiments to develop a predictive model of spear emergence for Michigan growers based on soil temperatures.

Dr. David Wolyn, professor at the University of Guelph

Bud and spear development of asparagus under constant temperature

Apical dominance and the number of bud clusters are relevant for yield formation. The most important differences between 'Backlim' and 'Gijnlim' were the number of viable buds and the number of active bud clusters.

BY CARMEN FELLER

Asparagus yield is the result of a complex sequence of physiological processes which are influenced by the environment and management in current and previous years. Meanwhile the knowledge of yield physiology has much improved. It is known that the total amount of asparagus yield is related to carbohydrate supply in storage roots. Also the number of buds can limit the total number of high quality spears. The apical dominance of a growing asparagus spear within one bud cluster is repeatedly described, but is rarely quantitatively proven. Therefore, our objective was to quantify the effects of apical dominance and bud cluster activity on asparagus yield pattern and to provide new experimental data for modeling of the asparagus crop.

Carmen Feller,
Leibniz-Institut für Gemüse- und Zierpflanzenbau (IGZ) e.V.

Experimental container trial

In April 2004, ten 40 L containers were filled with loamy sand taken from the top layer of an asparagus field at the research station in Großbeeren. A single, one year old asparagus plantlet was planted in each container. There were five containers planted with the cultivar 'Gijnlim' and five with 'Backlim'. The containers were set up in the field. Water and nutrients were supplied by drip irrigation. On April 1, 2008, the soil on top of the asparagus crowns was carefully removed. The containers were set up in a growth chamber at 20°C from April 7th, 2008, until July 4th, 2008. During this time spear length was measured daily except weekends and spears were cut close to the crown when longer than 25 cm. Each spear was assigned to a bud cluster, where a bud cluster was defined as a dense group of buds, clearly distant from other groups of buds on the crown. During the time in the growth chamber the containers were watered once a week but not fertilised. The light in the growth chamber was on only during the measurements.

Apical dominance of a growing spear

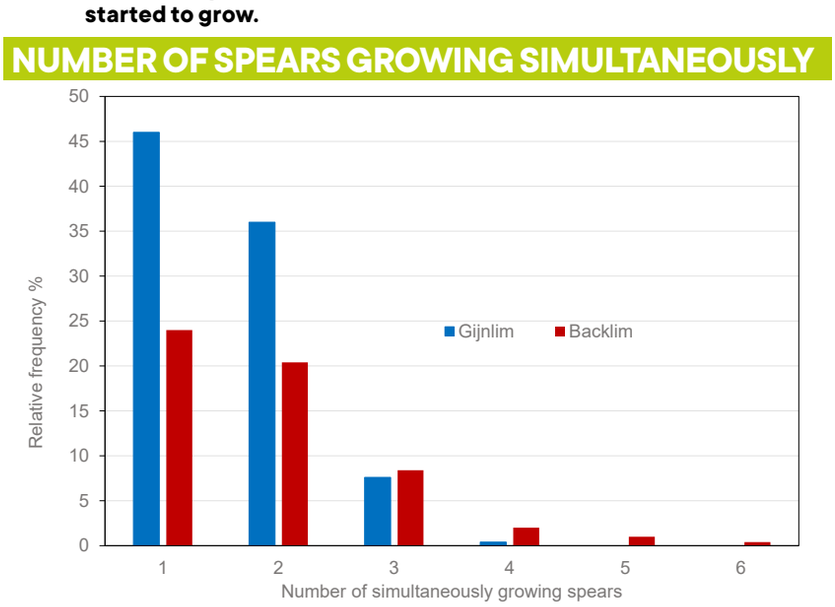
It was stated by Tiedjens in the year 1926 that the pattern of bud break is controlled by apical dominance within each bud cluster on the crown, i.e. growing spears produce inhibitory effects, which extends only to the buds of the same bud cluster.

There were many bud clusters in our experiment, which had only one growing spear at the same time because new spears started to grow only after the previous spear was harvested. This pattern confirms the message that a growing spear inhibits the development of the next bud. However, there were also bud clusters with up to four spears growing simultaneously. Hence, the appearance patterns of spears were quite diverse. Based on the frequency distributions observed in our study we suggest considering the effect of apical dominance within asparagus bud clusters as a stochastic process, in which the probability for a spear to start growing decreases with the number of spears already present at the same bud cluster. After a spear was harvested from a bud cluster which had no other growing spears, it took some time before a new spear started to grow.

Number of buds and spears

The active time of bud clusters was defined as the number of days between the start of growth of the first and

Figure 1: Number of spears growing simultaneously at the same bud cluster. Counted were the numbers of growing spears on all days when a new spear started to grow.



of the last spear at one cluster. The average number of active bud clusters was about five clusters per plant in both cultivars at the start of the experiment. Thereafter, the time course of active bud clusters showed marked differences between cultivars, with Backlim developing fewer active bud clusters and stopping spear production sooner.

The average spear appearance rates per plant showed characteristic patterns. Initially several – but not all – plants had a high spear appearance rate, which was caused by simultaneously growing spears at those bud clusters that were active from the start of the experiment. Thereafter followed a period with an almost constant rate, which resulted in a linear increase of spears. After a spear was harvested from a bud cluster which had no other growing spears it took some time before a new spear started to grow. On each day when a new spear started to grow we counted the number of previous days without growing spears at the same bud cluster. This number of days is called LAG. LAG equal to zero refers to spears that started growing when other spears were still present on the same bud cluster. At the end of the experiment, the average LAG for 'Gijnlim' and 'Backlim' was 5 and 3 days respectively. However, at the beginning of the experiment there was no LAG because two or more spears were growing simultaneously on all active bud clusters.

The number of harvested spears was significantly different between cultivars in our study. It is known that the number of buds is genetically controlled. The main period of bud formation is during fern growth following harvest and only a few buds are formed during harvesting. But even if new buds were formed, they may not be viable and hence do not contribute to spear yield of the current harvest. We observed that only a few new buds were formed during our experiments. Therefore, the plants run out of buds during the unusually long harvest period.

The cultivar recommendations for plant distance in the row are an indicator of the number of bud clusters. For example, a larger plant distance in the row is suggested for 'Gijnlim' than for' Backlim'. A genetically determined lower number of bud clusters mostly leads to thicker stems.

NUMBER OF ACTIVE BUD CLUSTERS RELATED TO TIME

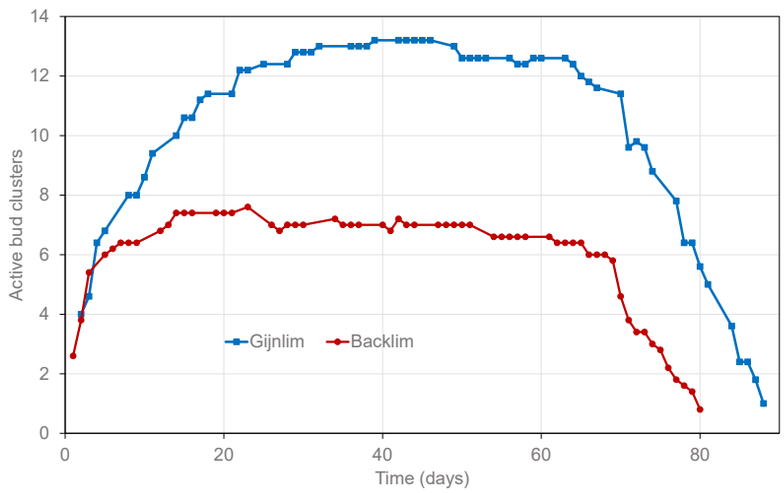


Figure 2: Number of active bud clusters related to time since begin of the experiment. Points show averages of five plants. Bud clusters were counted as active during the time between the growth of the first and of the last spear of each cluster

Carbohydrates in storage roots and spears

Our hypothesis that decreasing growth rates in time were caused by decreasing carbohydrate supply was not confirmed in this study. At the end of the experiment, the plants showed a broad range of carbohydrates in storage roots. However, there was no significant correlation with spear growth rate. AW

CUMULATIVE NUMBER OF SPEARS RELATED TO TIME

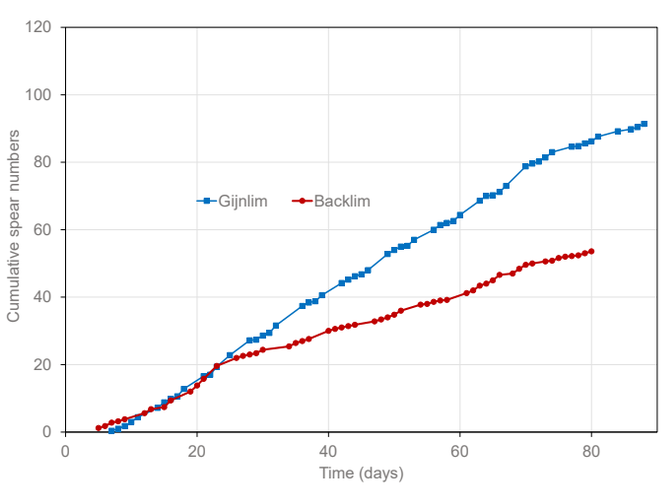


Figure 3: Cumulative number of spears related to time since begin of the experiment, average of the five plants.

April 2021 • Asparagus World n°3

Importance and interaction of nutrients in asparagus roots

The availability of nutrients has a significant influence on plants. It does not only affect the growth of plants but also other parameters like the quality of the harvested products and susceptibility to pests and diseases. It is well known that crops react to nutrients differently. The aim of this study was to examine the consequences of specific mineral status in asparagus.

BY DR. LUDGER ALDENHOFF, BDSE E.V. GERMANY

TABLE 1: SOIL SAMPLES OF TWO VARIANTS OF THE TRIAL IN 2017

		P2O5	K2O	Mg	B	Mn	Cu	Zn	Fe
fertilisation	pH	mg/100g			mg/kg				
-all	5.9	3.4	3.6	2.1	0.1	4	0.3	0.6	9
+all	7.1	12.8	7.4	3.3	0.34	18	1.4	2.1	11

Over the last few years, several pot-based fertilising trials were conducted to investigate different aspects of fertiliser application in asparagus. One of these trials was designed with seedlings in sandy soil with different nutritional contents.

Dr. Ludger Aldenhoff, BDSE e.V. Germany

Trial design

The trial contained several groups of 5 randomly positioned 5.5l pots, each group having just one nutrient withheld (all macro minerals and most micromineralls). As base material sandy subsoil of an existing asparagus field was analysed and then fertilised according to the trial design (table 1).

Seedlings were produced in grow plates filled with upper sandy soil from the same field. Once seedlings had developed at least one stalk, two plants were transferred into each pot. Overhead irrigation occurred at -200hPa and an additional small amount of the macro minerals and boron was applied once in the summer. In autumn, the crowns were weighed, and the mineral status of the roots analysed. This was repeated over three consecutive years.

Randomized placed 5,5-l-pots with a different nutrient status

Source: BDSE Bilder; Vesuche

TABLE 2: AVERAGE WEIGHT OF THE CROWNS IN AUTUMN 2016-2018

fertilisation	fresh weight [g]	
-all	10.9	a
-P	13.1	ab
-Zn	14.7	abc
-B	15	abcd
-K	16.6	bcde
-Ca	16.7	bcde
-Mn	19.4	cdef
-S	19.5	def
-Fe	19.8	ef
-Cu	20.2	ef
-N	21.2	efg
+all	21.6	efg
-Mo	21.6	efg
-Mg	21.9	fg
upper soil	25.8	g

letters show significant differences (LSD 5%)

Results and discussion

The induced lack of nutrients was evident in the amount of crown mass in autumn (table 2). Some treatments did not differ from the control (e.g. without giving Mg or Mo), whereas other treatments showed significant reduction in root mass (e.g. without any fertiliser or P). When a mineral was withheld from the plants, it translated to a reduced content in the root (table 3). For example, without giving nitrogen ("-N"), this group only contained 61 % of nitrogen compared to the average amount of all of the samples. The control group that received the whole spectrum of nutrients ("+all) was showing nearly 100% of each nutrient in the analysis. This indicates a close relationship between the soil and the root content, too – at least in the young stage of the asparagus plant.

Zinc was the only exception. Although lack of this mineral caused

TABLE 3: NUTRIENT CONTENT OF THE ROOTS IN WINTER 2016-2018 (IN % OF THE AVERAGE ALL SAMPLES IN THE TRIAL)

	Fertilisation													
nutrient	+all	-all	-N	-P	-K	-Mg	-Ca	-S	-B	-Mn	-Cu	-Zn	-Fe	-Mo
N	101	89	61	111	105	107	106	92	103	105	110	99	99	113
P	105	98	102	90	100	88	98	102	95	95	119	105	98	105
K	104	86	120	108	79	102	90	102	99	90	105	105	101	110
Mg	103	97	91	97	109	91	97	103	103	109	103	97	103	97
Ca	105	68	95	101	110	108	58	99	101	124	112	101	105	112
S	106	91	97	110	96	97	81	91	94	105	110	107	105	109
B	100	94	94	106	103	98	89	98	92	103	112	103	105	104
Mn	98	70	83	121	104	110	141	93	97	88	102	91	101	101
Cu	108	79	107	113	99	98	84	109	103	106	83	101	110	100
Zn	88	137	82	92	86	86	155	93	88	93	112	94	92	100
Fe	91	114	97	118	104	96	83	84	110	97	105	114	89	98
Mo	107	48	170	95	96	96	73	140	113	99	125	88	114	37

red = low content;
blue = high content

a significant reduction in root mass (table 2) there was only a small decrease in root content (table 3). There could be two explanations. Firstly, plants that lacked zinc in the soil showed the biggest differences between root mass in this trial (data not presented). Individual plants either grew normally or had significantly reduced growth. Secondly, the data showed all groups had an overall low zinc content compared to other trials and high amounts of data from crop fields in praxis. Additionally, calcium appears to be an especially important nutrient in asparagus. The relationship between fertilisation and root content was closest in this trial with very young plants. Lack of calcium also caused a lack of many other minerals. Closer inspection of the roots revealed a reduction in fibrous roots which may decrease absorption of some other micronutrients.

Conclusion

Although there were significant differences in the growth of the crowns and mineral content of the roots, there were no visible symptoms in fern. Other trials with plugs or crown also showed similar results. This indicates that root tissue samples may be more useful for improving fertilisation strategies than fern. The substantial differences in crown weight without visible differences in fern appearance in these various fertilisation strategies show that asparagus can have a significant "hidden hunger". This also indicates that checking the nutrient status of asparagus roots during winter can be a useful tool for improving plant growth. As with other crops, asparagus shows some antagonism in the absorption of minerals. For example, with manganese and calcium, lack of one leads to better absorption of the other. This could be used to check the basic absorption potential of the immobile calcium in older plants.

These investigations were only possible thanks to the financial support of the VSSE (the association of south German asparagus and strawberry growers.) AW

At planting, the potential for yield is predetermined by the varietal choice, its density and the technical means implemented (irrigation, fertilisation, plastic covers, etc.).

Establishing an asparagus plantation

The establishment of an asparagus plantation is carried out over several years. Multiple technical choices must be considered: variety, spread, density, etc., all of which are crucial to the profitability of the crop.

BY GUY DUBON @ReussirFL

Asparagus is one of the few perennial vegetable crops. Its installation is planned two years ahead and the plant can be exploited for about ten years. Nevertheless, it is the planting that is the defining moment. It's the moment when multiple technical choices must be made. Soil and climate often represent imposed parameters, but variety, density, depth of planting, etc. are more strategic decisions. The basics of plot preparation and tillage are common to any cultivation. Notable development in asparagus cultivation has come in the form of the prior input of green manure, the addition of organic matter and the deep working of the soil. What are normally considered recommendations

become obligations when replanting asparagus on asparagus. Lastly, it is the planting that determines the "economic potential" of the plot. The potential yield rests on the varietal choice, its density and the technical means implemented (irrigation, fertilisation, plastic cover, etc.). However, the planting configuration also influences yield as well as harvest speed, a determining factor in the final cost of production.

Respect the keynotes of plantation

Cultivating asparagus requires respecting certain "keynotes". The first step is to define the inter-row spacing, taking into account the existing equipment on the farm in order to avoid the need to invest in specific materials. Then, the rows must be of adequate length to optimise the investment in mulch, drip feed systems and labour for harvesting. For example, a hectare planted with 3.30m between rows represents 3 linear kilometres of ridge. This relates to the densification of asparagus (see box). The second keynote is the volume of land available to the roots; the larger the volume, the larger the root mass. A plant's yield is, of course, proportional to its root mass. The third keynote is to ensure that after too much rain or even flooding in winter, plants do not suffer from the presence of standing water. A

The organisation of the planting site is important to optimise the time spent.

MORE INFO

Choosing the right soil

A healthy, deep and well-drained soil is conducive to good asparagus cultivation. It is sometimes necessary to dig ditches and lay drains to improve these soil properties. But this is not about having dry soil - access to water and irrigation is essential! The ideal soil has a pH of between 6 and 7, and maximum clay content of 15% to avoid the development of fibres and bitterness in the spears. The maximum salinity tolerated by asparagus is 10 grams per litre. Soil test samples are taken at depths of 10–40 cm and 40–80 cm.

solution in this regard is to incorporate high ridge cropping (see Asparagus World No. 2).

Expanding inter-row gaps

Besides respecting these keynotes, many other precautions must also be taken, starting with healthy, well-drained soil (see box). Soil preparation begins one year before planting. This is the time to sow green manure, like Ray-grass, rye, mustard, siletta, phacelia, etc., which will provide a significant mass of organic matter when incorporated into the soil. However, it also destroys perennials, meaning that the land must be free and drained at the end of the summer before planting. Modification of lime or magnesium content in the soil is carried out, if necessary. Then, sub-soiling at a minimum depth of 80 cm is carried out across and in the direction of the rows. The supply of decomposed organic matter (dung, compost, etc.) is focused on the planting row. Then a spader passes along the row working at a depth of between 0.6 and 1.1m. The machine must work at very slow speeds in order to create a homogeneous, aerated, fertilised profile at all depths, which facilitates the descent of roots and thus limits the rise of the rootstock.

The orientation of the planting rows is another important element, with planting usually carried out in the direction of the slope, if one exists. The orientation of the rows can also be in the direction of the prevailing wind. However, with the widening of the

Deep soil work ensures good planting.

MORE INFO

Plant in deep soil

The use of spaders and deep soil planting is a fairly recent innovation. The goal is to get as much good soil as possible deep down and to oxygenate the soil as much as possible in order to attract as many roots as possible. Some equipment can allow the soil to be worked at depths of over a metre. But, it is imperative to adapt the depth at which the soil is worked depending on the location of the bedrock so as to avoid bringing up stones, clay, and chalk, etc. Working in the summer or autumn, rather than in the spring, will allow you to work at great depths. Before the passage of the spader, decompaction of the plot must be carried out across the field on the entire surface followed by a second passage only on the row. "The rise of poor soil to the surface is not a problem because good soil on the surface serves no other purpose than to confine the roots horizontally. At these depths, three times more earth is mixed than before. The soil that is going to be fetched up from this depth is generally less rich than the surface soil. A new soil must therefore be made with at least 3 times more organic matter and 3 times more phosphoric acid per hectare concentrated on the row than with spader-free methods," said Christian Befve, a consultant specialising in asparagus.

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distances between rows, not ridge-splitting at the end of the harvest and the grassing, the current trend is to plant across the wind as this strategy ensures better weeding efficiency. It also promotes the creation of a micro climate and avoids plastics films blowing away in high winds (see page 16).

Adapting to the current and future climate

Then comes the choice of the variety (or varieties) to plant. Asparagus World No. 1 devoted a long article to the presentation of varieties ("Varieties undergoing innovation"), while Asparagus World No. 2 contained an article on the choice of crowns ("How to achieve a good plantation"), both of which can be found on www.eurofresh-distribution.com/asparagus-world and befve.com. Bear in mind, however, that the selected variety must meet market demands to ensure it can be successfully marketed. Choosing vigorous and disease-resistant varieties is vital given the new legislation focused on reducing the use of chemical crop protection. The calibre of the spears determines the crop's profitability as it is the cost of producing a kilo of asparagus that essentially accounts for the cost of the harvest. Choose good calibres, as a 15g spear costs as much to harvest as a 45g spear, and is therefore 3 times cheaper per kilo to produce. Another key factor that now must be taken into account is how best to adapt to the current and likely futures climatic conditions (see page 12). AW

MORE INFO

Asparagus is phytotoxic for subsequent crops

Replanting a new crop of asparagus on the same plot can be risky. Indeed, the presence of the roots of old asparagus would be phytotoxic for the new crop. In addition, phytotoxicity increases from year to year after the cessation of cultivation, especially between the 2nd and 4th year. This effect of toxins emitted by old crowns on later crops was highlighted by Ludger Aldehoff, a German researcher at BDSE Brucshal, whose work was presented at the 2017 International Asparagus Congress in Potsdam, Germany. The practical advice is to "replant as early as the year after an asparagus crop is removed or wait at least ten years." The decrease in the root volume and absorption potential of the plant is also to be taken into account in the management of fertiliser inputs on an asparagus bed replanted with asparagus. Observations of 17 varieties of asparagus in virgin soil or replanted show that they react differently. Cumulus, Tallems, Gijnlim and Vitalim are found to retain their root potential in the replanting condition, while the root potential of Steiniva, Bacchus, Fortems and Ramon is reduced by about 30%. The other varieties show a decrease of about 20%.

https://www.koppert.fr/defis/coleopteres/criocere-de-lasperge/
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Asparagus is becoming denser

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Large gaps between rows and increased density improve picking speed.

More asparagus on the row means less distance to cover. Higher plant density and "new designs" increase profitability.

BY GUY DUBON @ReussirFL

Two planting lines and a staggered chevron layout increase the density on the row.

Today, new asparagus fields are usually planted at a density of between 30,000 and 32,000 per hectare for large-calibre crown varieties and between 22,000 and 25,000 for the most common ones. Density increases as distances between rows widen. This trend is directly related to the reduction in pickers' movement. In an asparagus plantation with 2-metre inter-rows, the distance travelled by a picker is 5 km per ha. When rows are distanced at 3.30 m, pickers cover only 3.3 km per ha. After 50 days of harvest, the travel gain is 85 km/ha. The picker will have walked 250 km in the first plot and 165 km in the second.

More soil volume for roots

But if the planting distance widens, the density must increase to keep the same number of plants per hectare. At distances of 2.5 m, 5 crowns can be planted per linear metre compared to 7 crowns for an inter-row of 3.3 m. Some plantations now have 4 m gaps between rows. This increase requires a new arrangement of the crowns on the row. From one planting line, we move to two planting lines 20 cm apart and a staggered crown layout to provide more useful space in which the claw can grow. It will therefore be necessary to open a wider planting trench. Observations made on these new asparagus designs show that they generate a 10% increase in yield compared to the smaller spread. They also extend the lifespan of asparagus plantations by 3-5 years thanks to the associated reduction in plant health risks. Moreover, they allow for better quality and better calibre spears thanks in particular to the large volume of earth available between rows. The widening of the inter-rows also facilitates ridging-up with a larger volume of surface soil available between the rows. It leads to better aeration of vegetation and a reduction in foliage health problems (e.g. rust and stemphylium). Working between rows is also facilitated and work times reduced (shorter rows to be covered and maintained). It reduces investment in equipment in linear metres (drip feed ducts, plastic covers, etc.). Finally, this mode of implantation allows the cultivation of green manure in the inter-rows and offers the possibility of replanting in soil that is (almost) free of asparagus (see page 36). AW

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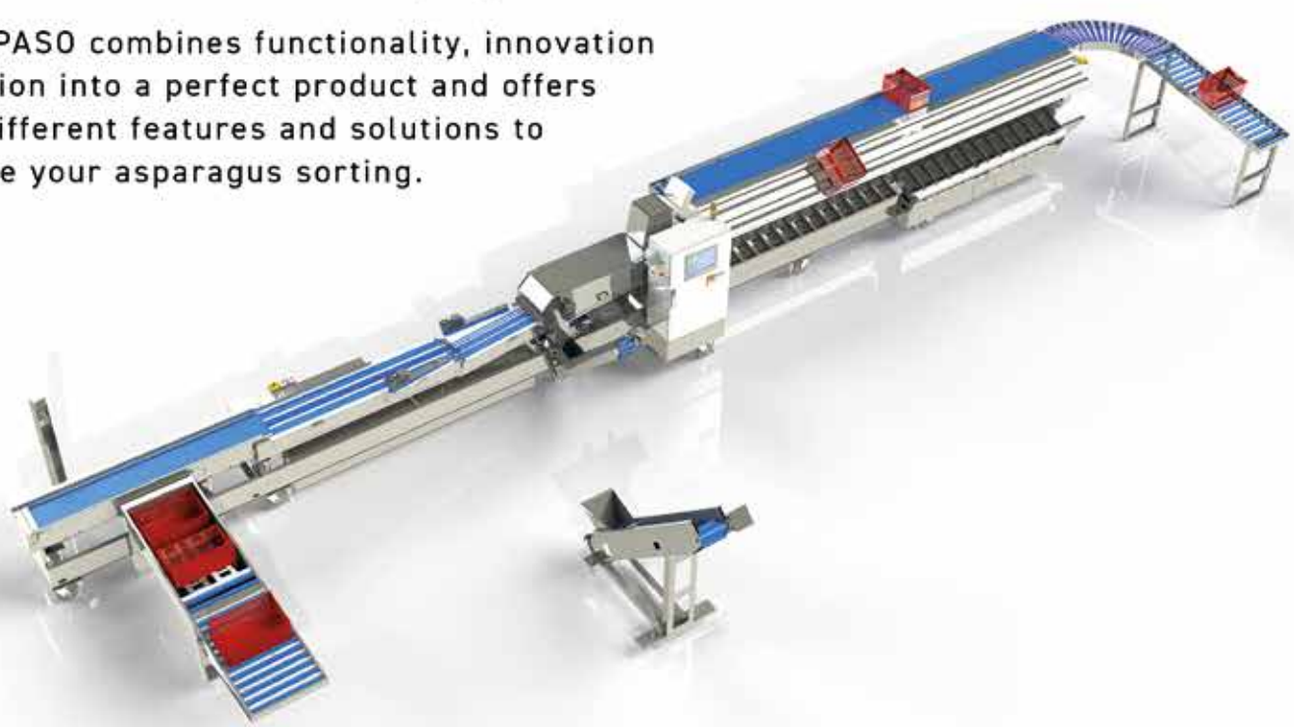

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Asparagus goes **high-tech**

New technologies are coming into agriculture, and asparagus is no exception. Drones, probes, cameras and sensors are already used to optimise crops, creating data that generates new developments.

BY GUY DUBON
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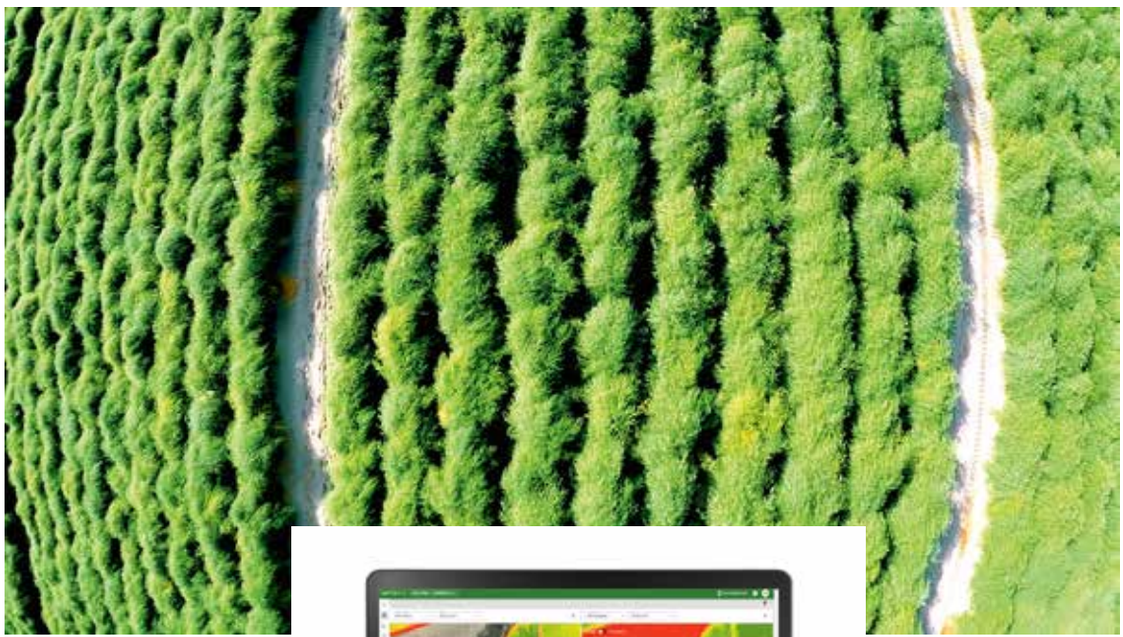


New technologies, such as drones and infrared imaging, provide a new understanding and control of the asparagus crop.

Connected agriculture is the convergence of agriculture and information technologies (sensors, vision, networks, assessment tools, robotics, artificial intelligence, etc.). When adapted to crops, these technologies can improve productivity but also meet environmental and societal expectations. Already present in livestock and in other crops, these new technologies are now coming into the field of asparagus, too, as evidenced by César Urrutia in Peru and Olivier Lamote in France.

The primary functions of these new technologies regard the accumulation of data. Occasional human observation is replaced by digital continuous information capture via sensor, probe, camera, drone and satellite, which all generate data. This information can be stored, compared and modelled, but its final use still requires human analysis, i.e. asparagus professionals and specialists. This influx of information can amplify experts' skills. The high speed of information transfer allows precise decision-making and fast implementation.

A mine of information

Connected agriculture is still in its infancy. It therefore has to contend with various problems, such as the sometimes anarchic development of the various tools, the reliability of companies (often start-ups) that supply them, and the competence of the people who use them. One might think that it will never become easier to implement going forward.

However, many observers of connected agriculture predict and anticipate other problems, including the accessibility of data while avoiding "toll networks", the inter-compatibility of data between different sources to make it possible to assemble and exchange, and the control and ownership of this mine of information. Data is, however, spawning major developments. For instance, experiments could go from being a demonstrative study (research, tests, development) to a demonstrative study with the acquisition and comparison of a great deal of data to determine the development or the solution. In the same way, it is possible to go from being reactive when piloting plots (as is currently the norm) to making decisions in anticipation thanks to forecasting knowledge, live information and future simulations. At the moment, the very high costs are the key obstacles to development. The lack of engagement between the agricultural sector and high-tech companies and managers is another limitation, as is the incomplete coverage of communication networks.

"Using AI to **anticipate droughts and diseases**"

César Urrutia from Space AG, a Peruvian start-up, offers Raptor Forms: a mobile application for making evaluations and collecting field data.

"Artificial intelligence will help growers find correlations and anticipate droughts or disease," César Urrutia from Space AG*

The agricultural sector is undergoing a drastic technological transformation because of the COVID-19 pandemic. Farmers need information to make better decisions on time and the current restrictions make it more difficult to be present every day in the field, so decisions have to be made remotely by fewer people.

Many start-ups in the agro-technology sector have received millions of dollars to develop solutions based on drones, satellites, internet of things, sensors, big data, analytics, robots and artificial intelligence, which provide valuable information so farmers can have greater profitability based on making informed decisions. The most successful companies in the digitisation process are those that put technology adoption high on their priority list and where stakeholders are actively involved in the process.

When the manager of a leading agro-exporter in Peru told me that he wanted us to help him in his digitisation process, I understood that it was a long-term task. Preliminary analysis revealed that the internet speed was very limited and that there was a wealth of data, but it was disorganised and not very accessible to all areas.

Field evaluations, for example, were collected empirically on a reduced area with paper and pencil, and then digitised later on. When a real problem was detected, it was too late to do something and fix the problem.

Today's high internet speeds make it possible to view satellite images or high-resolution drone images to detect problems in the vegetation due to salts in the soil, water stress or disease. It is also possible to use mobile phones or tablets to collect photos or information where problems are detected. For example, in the case of asparagus, it is possible to measure damage due to prodiplosis, noctuids and elasmopalpus. This information can be collected in digital form on the evaluator's mobile phone and viewed in real-time on a computer controlled by the manager or the head of irrigation or production. All the information is integrated in a single platform that also incorporates meteorological and irrigation data.

Having all the information organised on a single platform, without errors and immediately available allows us to use artificial intelligence to find correlations that can help anticipate droughts or disease related to rises in temperature or humidity, or find correlations between the vegetation index or NDVI of a satellite image and estimated yield.

The automation process also allows control of the quality and quantity of production in the field by ensuring more productive plots. Tools such as digital codes or QRs permit better monitoring and traceability. All of this information can help us reduce logistics and labour costs since we know in advance the daily production and how many people we need. All decisions today can be made on an informed basis, rather than by simple intuition.

**Space AG is a Peruvian start-up with a clear mission to feed the world using technology. It has extensive experience with superfoods like blueberries, avocados, grapes and asparagus. The firm's main products are Airview (for collecting data using satellites and drones), Raptor View (a decision support platform that integrates information from different sources) and Raptor Forms (a mobile application for making evaluations and collecting field data).*

Agro-technologies serving asparagus

Olivier Lamote of Cosmocel

In France, Cosmocel offers the SSAT (Agro Technological Monitoring Service), which brings together various new technologies at different levels of the plot (e.g. probes, sensors, cameras, satellite). "This agro-technological monitoring aims to enable us to have a better understanding of the crop, facilitate decision-making and better understand the effects of the bio-stimulants we market," said Olivier Lamote of Cosmocel. This service, offered free by Cosmocel to its partners, includes soil and leaf analysis (Pronut), which, thanks to the use of deep learning software based on 10,000 analyses, can make recommendations for fertilisation. It also monitors Redox Potential. "It's about estimating a soil or plant's oxidation potential using a voltmeter and analysing it. In particular, it helps to define the risk of disease development," said the specialist. "The concept of Redox Potential is something which is increasingly being taken into account in agriculture and can provide the key to understanding many phenomena," he said. The SSAT also provides a diagnosis of a crop's photosynthetic performance with the measurement of the NDVI (normalised difference vegetation index) by satellite imagery (Taranis). Soil water kinetics (Spiio) are also evaluated with sensors that record humidity/temperature/EC, etc. Finally, the service uses time-lapse cameras that take one photo per day in the same location. "By compiling the images, it is possible to visualise the growth of the plants and see differences in growth according to the feeding of the crop," said Lamote. The first measurements taken in asparagus crops in 2020 have prompted Cosmocel to re-test in 2021. The objective is to establish a repository for this culture over the next three years.

Innovation is dynamic

The year 2020 was deprived of the many trade shows and meetings that are important places of exchange for companies. Innovation has nonetheless remained strong and dynamic. Some of these new products here are presented here.

Hopefully the trade shows will be back in 2021.

Hepro

conquers Spain with vertical industrial peeling machines

The asparagus sector of Navarra swears by Hepro®'s industrial peeling machines. "We always fly to Spain as a team. During commissioning, we take the time to answer queries and familiarise customers with how the peeling machines work," said Ellen Reinhold, responsible for sales in Benelux, Spain and Peru. The vertical peeling principle is particularly popular within the asparagus processing sector. It enables customers to cut personnel costs and optimise the peeling process. In addition, thanks to Hepro®'s unique vertical-cut quality, there is no need for reworking. The machines are manufactured in Germany and marketed worldwide. Hepro® peeling machines have been used successfully in Spain, Peru and China for over 10 years. "We visit our customers on site at regular intervals. We are also very well positioned in terms of IT, so that spare parts can be shipped worldwide within 24 hours. Our customers can reach us by phone at any time. But nothing can replace an on-site visit," said Reinhold.

Strauss

optimises processes & cuts labour costs

Strauss Verpackungsmaschinen is a world-famous supplier of harvesting, sorting, weighing and packing equipment for asparagus. Their latest invention, released in 2020, is the PLC software solution for existing combination weighing units, providing easy handling thanks to a powerful and precise machine. Strauss sorting machines come with an improved counter-rotation system under the camera for even better turning of bent asparagus. Moreover, thanks to its weighing segments, the customer can process exact bundles to achieve best-quality results. Meanwhile, the firm also offers the GUB buncher to cut foil consumption. As a stand-alone machine or in addition to a sorting or weighing machine, the device bunches products with two rubber bands and an optional label application, or with one rubber band and one ElastiTag®. Strauss customers can benefit from the support of a close network of sales and service teams, developed over the past 20 years.

Tenrit

goes green

Tenrit has added a new product to its range of asparagus peeling machines: the Tenrit Solo A Green. The innovative feature of the machine is that it peels both white and green asparagus, with the latter only being peeled in the last third of the asparagus. The change from white to green is made quickly at the push of a button. "This makes it possible not only to peel green or white asparagus continuously, but also to respond flexibly to customer requests," said Carl Philipp Tenge-Rietberg, managing director of Tenrit. Via the touchscreen, peeling pressure can also be selected to match the selected sorting: thin asparagus requires less pressure than thicker asparagus. The device also peels products with curved shapes and bent heads, which are more common in green asparagus. This new peeling machine is suitable both for production, with a continuous output of 3,600 pieces per hour, as well as for farm shops or weekly markets. The machine has a footprint of 1.90m x 0.70m and can be equipped with compressor and water supply for mobile use. It only requires 230V electricity.

Neubauer Automation

water jet cutting

ESPASO - the most sold automatic asparagus grading machine for white, green and purple asparagus over the world, is developed by Neubauer Automation with the best technology to simplify work flow, reduce costs and increase productivity. Now we are glad to introduce the unique system in the market: the sec -water jet cutting -. This is an option you can add to the ESPASO. The length of each spear is determined and its curvature is also taken into account. Then the spear is cut to the exact length according to your requirements by the water jet cutting robot. This procedure significantly reduces the waste of each spear and will markedly improve your profits up to 12%!

Cerescon

first three Sparters

After successful acceptance tests, Cerescon delivered the first three Sparters in the past few weeks: two in the Netherlands to Teboza and Martens Asperges and one in Germany to Früchtehof Ahlbrand in Warendorf. The fourth selective asparagus harvesting machine has been sold to a Dutch grower in Noord-Brabant. In recent weeks, various operators from Teboza, Martens and Ahlbrand have been trained to operate Sparter in the field. Cerescon has produced a total of six Sparters in 14 weeks in a production hall in Reusel. These six Sparters will start harvesting in the Netherlands and Germany. In addition, Cerescon is planning various demonstrations with the robot at various growers in Europe. Cerescon invites interested parties in a demo to contact them.

Janny MT

180 kg and 30 days storage

For several years now, Janny MT has been working on the development of new membranes to improve their permeability and therefore increase the volume of asparagus stored in a natural controlled atmosphere in their storage modules. This has now been achieved. In practice, the far superior permeability of this new membrane makes it possible to optimise the modules to store up to 180 kg (compared to 90 kg previously). This new material will still be tested by a number of companies in 2021 to expand on a bigger scale the following years. "I think we have achieved an important breakthrough for the industry: we now need to bring it on to the profession." the company commented.

Reyenvas, S.A.

launches Rey Pro TR

Reyenvas, S.A. has developed a new product for cultivating white asparagus called Rey Pro TR, which is revolutionising the European markets. This new pocket-film is designed to reduce labour costs and improve crop quality. The figures obtained to date show that it boosts yields by two or even three times compared to traditional films and offers a clear improvement in crop quality. The Rey Pro TR is a multilayer sheet, the underside being of black PE, the middle of white PE and the top of black Biopolymer. With growth, the biodegradable sheet is stretched, at which point, the white colour of the middle-sheet appears to prevent burns or the opening of the asparagus heads and improves fruit size. This biodegradable sheet disappears within 12 to 16 weeks. Asparagus can grow to up to 15cm above the ridge, significantly reducing the percentage of colouration or open heads and cutting harvest frequency to every 4–10 days, thus increasing profits by up to €10,000 per hectare.
This innovative product is distributed in Europe by F.I. Trading, which actively participated in developing the Rey Pro TR.

Cosmeco

specialists in asparagus cultivation

Cosmeco Srl has specialised in the production of agricultural machines for more than 40 years. The firm has now added to its range for asparagus, with the market launch of the B70 bedformer, a totally adjustable machine that can form seedbeds at up to 70cm high. Cosmeco has also developed two new accessories. The first is a film-holder - a reel support for laying films made of plastic or other materials. It is totally customisable both in terms of film width and height from the ground, which allows placement on seedbeds of any height. The second innovation is a film winder/unwinder for drafting or collecting films made of plastic, TNT or other materials with pockets for ballast designed specifically for asparagus. Equipped with a tear-proof hydraulic clutch (tractor hydraulic system) and braking system to allow adjustment of operating speed, the item is currently available for film widths of up to 180cm. Other products in Cosmeco's line for asparagus include mulch-laying machines, which are totally customisable and can be applied to bedformers to permit multiple operations in a single step.

Europlastic

presents double film and new plastic range

Europlastic continues to innovate and adapt to the needs of ever more technically demanding customers by offering more up-to-date and efficient product ranges.
Multitech is a double film for growing white asparagus on arches. It provides excellent agronomic and financial results for producers. The two-in-one product is made up of two films assembled together, one thermal and the other opaque. It is easy and economical to use as it requires handling only one film and can be used on a single type of hoop. Multitech offers a very good relationship between investment, yield, quality and labour costs and represents excellent value.
Asparaclim is a new plastic range dedicated entirely to green asparagus cultivation and was specially designed to meet the requirements of this very technical crop. It offers greater efficiency thanks to its climatic effect by acting as a barrier to conserve humidity in the tunnel. In addition, the film's athermic properties allow prolonged use during harvesting, thus considerably improving the yield, size and quality of asparagus. Asparaclim is a plastic designed for cultivating green asparagus.

Arrigoni

agrotextiles that protect against insects and rain

Arrigoni has expanded its range of agrotextile solutions for crop protection. "This year we have been working on three main lines of innovation. We have improved air circulation with Biorete Air Plus®, which can protect against insects and parasites of all sizes by ensuring a passage of air that is up to 32% greater than offered by standard insect nets. Meanwhile, for rain control, we have developed Protecta®, an innovative fabric that reduces the passage of rainwater by over 90% while continuing to allow normal air circulation. It has a durability of over ten years. Finally, to prevent the drift of phytosanitary and fungicide treatments, we are introducing new fabrics that are capable of blocking the uncontrolled spread of treatments. This allows growers to carry out organic production without having to worry about what is happening in a nearby field," said Davide Daresta, communications manager. Arrigoni's agronomists work closely with the major farms (open-field and high-tech greenhouse), and has 2,000 customers in 72 countries around the world.

CoRHIZE

the app for asparagus producers

The AspaView kit is a complete all-in-one tool developed by CoRHIZE to support asparagus producers all year round. It helps control irrigation in season, monitors temperatures during dormant periods and helps manage mulch during harvest. The specific module on the Columbus app is improved each year taking into account the experiences of producers and technicians. "We remain committed to developing reliable and practical tools that offer both basic and highly specialised support for different user profiles," said Serge Escuraing, CEO of CoRHIZE. With its Nutrisens kit already employed by several technical organisations, the company is also working on improving nutrition.

Leonardo Zanarini

Ecogreen

electric asparagus harvesters

Ecogreen Italia presents a new device to accompany its electric asparagus harvesters. It's an anti-slug pellet dispenser. Slugs are more and more frequently attacking the asparagus fields with consequent production problems. Ecogreen wants to help growers with this new device which is easily installed at the rear of its electric machines to dispense anti-slug pellet while running along the asparagus rows. The dispenser is connected to the electric unit of the machine and, by adjusting a potentiometer, the worker adapts the quantity of slug pellet that is distributed along the row. It's a very practical, easy to use system that helps optimise your harvest.

Ionnis Tsakiris

Daios

Dalin Pocket Advance, the new film

Daios, the largest Greek producer of agro-textiles since 1977, specialises in films for protecting asparagus crops: "Our latest novelty is called Dalin Pocket Advance. It is a pocket film specially designed for asparagus. Thanks to a special valve, it allows the cells to be filled while preventing soil from entering. Rainwater can enter but it is drained through the micro-holes on the cell and this guarantees better performance with great benefits and lower costs for asparagus producers," said Ioannis Tsakiris. Like most of the company's special films for asparagus, Dalin Pocket Advance is destined for the major European markets, especially Germany (80%).

Oxybiotop

presents preventative treatments against asparagus beetle

In the fight against asparagus beetle, Oxybiotop proposes SILSTIM. The product consists of macerations of insect-repellent plants, which are classified as "basic materials", making it eligible in organic agriculture. Recommend dosage is 10L/100L of water sprayed with 2L of (very viscous) black soap. The application must be used preventively (i.e. before the presence of insects), even before the appearance of stems and foliage in the summer. It must be reapplied every 15 days, or every 7 days in cases of heavy rains. SILSTIM repels insects before they can even lay their eggs and it also prevents the development of any eggs by gluing larvae and adults together with a very viscous black soap as well as through the plants' repellent effects. According to the Oxybiotop, SILIBOOST allows soil oxygenation despite compaction and thus stimulates biological activity, providing a healthy bacterial shield and guaranteeing soil and plant balance.

Medinbio

two synergetic microorganisms

Medinbio, pioneer and leader in the System Approach, has just obtained the approval of GAIA Sol for all crops and particularly relevant for asparagus. It's a unique combination of two synergetic microorganisms: Trichoderma, for strong soil colonisation and Bacillus, close to the roots and rebiotics (algae, humic acids, etc.) to promote the microorganisms' development. Better yield with:

- accelerating of the nutrients' release
- occupying the soil, thus reducing fungal pressure
- eliciting the roots and the plant protection against Stemphylium.

For these actions, GAIA offers a remarkable cost effectiveness ratio. Application: Autumn: 1.5–3 kg/ha depending on sanitary conditions; Postharvest if risk of soil diseases increases during winter: 1.5 kg/ha; End of summer 1,5 kg/ha to activate the defense systems to face the risk of Stemphylium. Medinbio's product range for asparagus also includes Greenflash and KHI2 for defense systems activation, while SCUD and Cleanhex will be applied during the risk period.

Cichorium

an endive and asparagus parallel

Cichorium sees a parallel between endives and asparagus. These two plants have an incredible and faithful memory of their life cycles. In both cases, their consumable crops are derived from a reserve organ (the crown of the asparagus and the root of the endive) and come from a dormant bud. The growth of both plants is closely linked to temperature and humidity levels, which makes it possible to adapt production to a certain market or industry. Both vegetables grow in the dark (in earth or air) and quickly turn green in the presence of light. It is based on these parallels that Cichorium has become a producer of organic endive and offers EndiCAR. Its quality chicory is produced all year round by means of a complete cultivation system that is free of any form of treatment.

Keragro

innovative crop protection

Composed of medicinal plants and essential oils, ALGOPREV promotes a healthy and protective environment for asparagus crops and prevents certain biotic stresses, (e.g. larvae and insects). Keragro manufactures a range of specialties capable of preventing certain invasions or diseases. The formula is made up of seaweed, plants, essential oils and trace elements to nourish, fortify, dry, dessicate, protect and scar over asparagus crops. KeraSoufre powder has a proven track record thanks to its repellent and fungistatic effect. Keragro supplies direct to customers in France and is currently seeking distributors outside of the country.

Getade

plant immunology

Getade has been developing alternative solutions for plant protection for more than 20 years.

Its core business and know-how are based on enhancing the physiology and immunology of plants through messenger vaccines (European patents), especially on asparagus crops. Getade offers tailored programmes to meet the desired objectives of different stakeholders in the sector and welcomes any special requests.

Find out more on the website www.getade.fr

What's new in varieties?

The creation and observation of new varieties is of great importance in the innovation of asparagus production. Numerous breeders present their innovations and varieties currently being launched.

Bejo

unveils surprising purple and tricolour asparagus

© Bejo

Bejo has presented the first 100%-male purple asparagus, Erasmus, which can be cultivated in cold and intermediate areas. Erasmus is delicious when used fresh and unpeeled. This super sweet salad asparagus is best left uncooked in order to keep the bold purple colour, which can be lost during cooking. The special characteristics of the Erasmus purple asparagus distinguish it from well-known green and white varieties and represent an interesting addition to the current asparagus market. Bejo's Cumulus variety is a well-known beautiful and tender white asparagus with an exceptional taste that can also be enjoyed when cultivated as a green asparagus. When grown slightly beneath the soil surface, it develops attractive tricolour spears: white, green and purple. Besides offering a colourful asparagus, Cumulus also promises a special taste experience and can be consumed fresh unpeeled. Easy to prepare, healthy and tasty, this tricolour asparagus meets changing consumer demands. It's delicious used raw in fresh salads, as well as cooked in stir-fry dishes and on the BBQ.

© Limgroup

Limgroup

introduces Maralim

After years of intensive and successful trialling, Limgroup brings the asparagus variety Maralim onto the market. Maralim is suitable for the production of white asparagus in the mid-early segment in temperate climates. Thanks to its perfect tip-closure, the harvesting rhythm can be changed, while maintaining the same quality level, which can save labour costs. Trials have shown that the yields of Maralim can be up to 17% higher than for conventional varieties in the mid-early segment. The variety's high productivity and good sorting translate into more kilos of class 1 asparagus and therefore higher turnover per hectare. In short, growing Maralim can lead to gains of several thousand euros per hectare. Maralim produces a typically white and straight asparagus and has very low susceptibility to breakage, hollowing, pink discoloration or rust. The variety is perceived as very tasty by consumers. Maralim can be used in all sales channels, from retail to home delivery, where, among other things, quality and taste are what lead to repeat purchases.

© Planasa

Planasa

launches three new asparagus varieties

Planasa has just launched three varieties onto the market that will be available from 2022. Darkong, Darzan and Darius, the names of the three new selections, mark the start of the renewal of its variety catalogue planed by the company for the next five years.
The three selections are characterised by 100% male genetics, following the research line that began with Darvador, whose development is offering very good results to European growers.
As for its individual characteristics, Darzan is somewhat less precocious than the well-known Darlise, but offers great production and exceptional vigour. Darkong, on the other hand, is a good choice for growers who opt for high yields and large sizes for white asparagus production. And finally, Darius, although a late variety, provides uniform quality throughout the season.
These three new selections, together with Darvador, are Planasa's commitment to gradually renewing its catalogue and offering growers varieties that will help them to be more competitive and position themselves as market leaders.

© Eurofresh Distribution

Marcello Sbrighi

Coviro

offers green and white asparagus for the most diverse climates

Over the past couple of years, Coviro has presented new varieties suited to growing in Mediterranean climates, such as Starlim, Atticus, two early green hybrids of Dutch origin, and an absolute novelty Espada, which is also very early and was developed by the University of California. These join a range of well-known varieties such as the early Atlas and De Paoli, Grande (a high-yielding Californian hybrid), and Vegalim (a late hybrid). "As for the varieties suitable for continental climates, we have had great success with green ones of Italian origin, which represent about 80% of our offering. These include Eros, Giove, Ercole and Franco, as well as the Dutch Magnus. Among our white varieties, we have the Dutch Grolim and Cumulus, and, above all, the Italian Vittorio, which is a new hybrid with high climatic adaptability and can be used for the production of both white and green asparagus," said Marcello Sbrighi, sales manager. The current campaign seems to have started promisingly, with the prospect of repeating the good results of 2020, when 2.5 million plants were sold. This followed two difficult years during which yields had dropped by as much as 40%. Coviro's production is destined mainly for the Italian market, as well as Slovenia, France, Germany and Hungary.

© Walker Brothers

Walker Brothers

consolidates partnership in EU with Blumen Vegetable Seeds

Although the Covid–19 pandemic brought unprecedented challenges to industries around the globe last year, Walker Brothers never stopped exploring new ways to improve its asparagus business. By consolidating its partnership with its European distributor, Blumen Vegetable Seeds, Walker Brothers, Inc. continues as a leader in the asparagus world.

Since the outbreak of Covid–19, Walker Brothers, Inc. has witnessed an increase in growers wishing to produce and supply fresh asparagus domestically. New growers have contacted the firm via various virtual platforms. Through these connections, the company has found new homes (e.g. in Africa) for its productive and competitive green hybrid asparagus varieties, including Atlas F1™, Grande F1™, UC 157 F1, etc. In this group, Grande F1™ stands out as the dominant variety in Mediterranean countries and has been tested by new growers in areas with similar climates. Walker Brothers, Inc. understands the importance of developing more efficient varieties that offer sustainable and profitable returns, in addition to offering its existing commercial varieties. New hybrids from the Walker Breeding Programme are being tested in 17 countries, including Italy, Spain, and other Mediterranean countries. Walker Brothers, Inc. and Blumen Vegetable Seeds will continue to proudly supply regional and international growers with its decades of expertise in asparagus.

© Lamboseeds

Lamboseeds

presents rustic Saent asparagus

For the first time, Lamboseeds is to offer the market a different variety of asparagus, characterised by a more marked and bitter taste than traditional asparagus. "Saent was born out of a research and development project developed together with Luciano Trentini, who also takes care of the agronomic aspects, and developed commercially by Ortofrutta Castello, supplier of Coop. Saent is a recent variety with rustic characteristics and a tendency to develop a purplish red colour. It is medium-sized and the result of a cross between the Officinalis genus of asparagus and wild asparagus, selected from the species of the Veneto coast. It is ideal for lovers of strong-flavoured vegetables. In 2021, we'll launch the first major volumes in sustainable packaging containing an information sheet to inform customers of the product's value," said sales manager Sandro Colombi. Meanwhile, in addition to producing asparagus for the fresh market, the first trials of industrial processing are set to get underway in collaboration with Sipo to create derivative products for the kitchen such as spreads and pesto. Italian retail will be the target market in the initial commercial phase, focusing particularly on connoisseurs of niche and high-value products.

Un importante porcentaje de los costes productivos corresponde a las labores de cosecha.

Producción en Perú

Dejando atrás un caótico 2020

A mediados de los años ochenta, el arrollador éxito del espárrago peruano fue tal que abrió las puertas al desarrollo agrícola de este país. Si bien las producciones y exportaciones permanecen estables desde hace una década, las empresas que siguen en este sector tienen como objetivo no perder competitividad en los mercados internacionales.

BY RODRIGO PIZARRO YÁÑEZ

Una vez que en 2011 Estados Unidos estableció el tratamiento cuarentenario para el espárrago fresco proveniente del Perú, el sector desaceleró su crecimiento anual. Así, los volúmenes exportados se han mantenido en 130.000 toneladas y el valor de los envíos continúa fluctuando los US$400 millones (unos 330 millones de euros aproximadamente). El impacto no ha sido menor, considerando que Estados Unidos recibe el 70% de los envíos peruanos de esta hortaliza. Además, esta industria está aún a la espera de los resultados del informe de Aphis, de Estados Unidos, sobre el riesgo de plagas en el espárrago que, de ser favorable para la industria peruana, podría significar el fin de la fumigación con bromuro de metilo, que resta vida de anaquel a esta hortaliza.

En un año marcado por el Covid-19, la campaña peruana de espárragos no estuvo exenta de inconvenientes. Específicamente, el gran problema del 2020 fue la falta de transporte aéreo hacia la Unión Europea ya que, producto de la pandemia, hubo recortes en los vuelos comerciales y turísticos que cuentan con espacios en sus bodegas. Pero, ¿qué hicieron algunas empresas? Trabajar con atmósfera modificada para que la hortaliza pudiese tener una más larga vida de

ABSTRACT

Rodrigo Pizarro Yáñez

Leaving behind a chaotic 2020

In the mid-eighties, when asparagus became Peru's number-one non-traditional agricultural export, the crop's success was so overwhelming that it kick-started the country's agricultural development. The agro-climatic conditions of the Peruvian coast mean that asparagus can be harvested all year round and exported in different forms (fresh and processed). Today, Peru is the world's second-largest supplier of asparagus, only surpassed by Mexico. It ships over 90% of its exports to just 3 destinations: the United States, Spain and the Netherlands. Although production and sales have remained stable for a decade, companies in the sector are working to ensure they maintain their competitiveness in international markets, especially after such a turbulent 2020, which was marked by the Covid–19 pandemic and agrarian worker protests.

poscosecha y así poder hacer envíos marítimos, aunque a un mayor coste productivo.

Movilizaciones sociales marcaron el fin de año

Por si fuera poco, y cuando estaba acabando la que quizás ha sido la campaña más atípica del espárrago peruano, a finales de diciembre se produjo un estallido social, que afectó a las dos principales regiones productoras del país: Ica, en el sur y La Libertad, en el norte.

Las movilizaciones impactaron las cosechas de fin de año. Hubo muchos campos que no pudieron ser cosechados. Y ya se sabe que, cuando no se cosecha una esparraguera esta vuelve a florear, debiéndose esperar hasta la siguiente temporada. Este problema llegó justo en temporada alta y si bien se perdió producción, hubo además un impacto negativo en los jornales de los trabajadores.

Estas movilizaciones motivaron que en diciembre pasado el pleno del Congreso peruano aprobase un texto sustitutorio de la Ley del Régimen Laboral

> **“Los rendimientos productivos en Perú en 2008 eran de 10,7 t/ha. Una década después estos eran de 11,6 t/ha.”**

Huerto de espárragos junto a uno de uva de mesa en el norte del Perú.

No solo fresco

La producción de espárragos en Perú no solo está destinada para la venta en fresco. Un importante porcentaje de esta hortaliza se destina a la agroindustria, cuyas principales empresas están ubicadas en el Departamento de La Libertad. Allí es donde se producen conservas y congelados. **Las exportaciones de conservas sufrieron un fuerte crecimiento en 2020,** con envíos que superaron los 108 millones de euros, versus los 79 millones de euros que se habían conseguido en 2019. Sin embargo, **los envíos de congelados sufrieron un retroceso de un 14%** respecto de 2019, en gran parte, **motivados por la pandemia del Covid–19.** En 2020 las exportaciones fueron por 31 millones de euros, mientras que en 2019 habían sido por 34,5 millones de euros. **Los envíos en estas tres presentaciones sumaron 469 millones en 2020.**

Agrario, que establece una Bonificación Especial por Trabajo Agrario de un 30% de la Remuneración Mínima Vital, lo que actualmente suma 62,40 euros. Este bono no tiene carácter remunerativo. Además, la ley establece que el sueldo diario sería de 10,80 euros; y que los trabajadores podrán acceder al 5% de las utilidades de la empresa hasta el 2023, que subirá a un 7,5%, hasta el 2026 y, a partir del 2027 será del 10%. Según la Asociación de Gremios Productores Agrarios del Perú (AGAP), en promedio las empresas agroindustriales con más de 100 trabajadores pagan 345 euros al mes.
Para los expertos, lo que hace esta ley es ajustar lo que se tiene que pagar por mano de obra. Así, mientras más se dependa de la mano de obra, más subirán los costes. El tema es que el piso que ha marcado la ley es igual para todos y hay incertidumbre sobre si los pequeños productores esparragueros lo podrán soportar.
Para muchos, los esparragueros serán uno de los más afectados, ya que en época de cosecha se necesita un importante número de trabajadores y también personal para aquellas labores típicas que se deben realizar en el huerto durante el año.

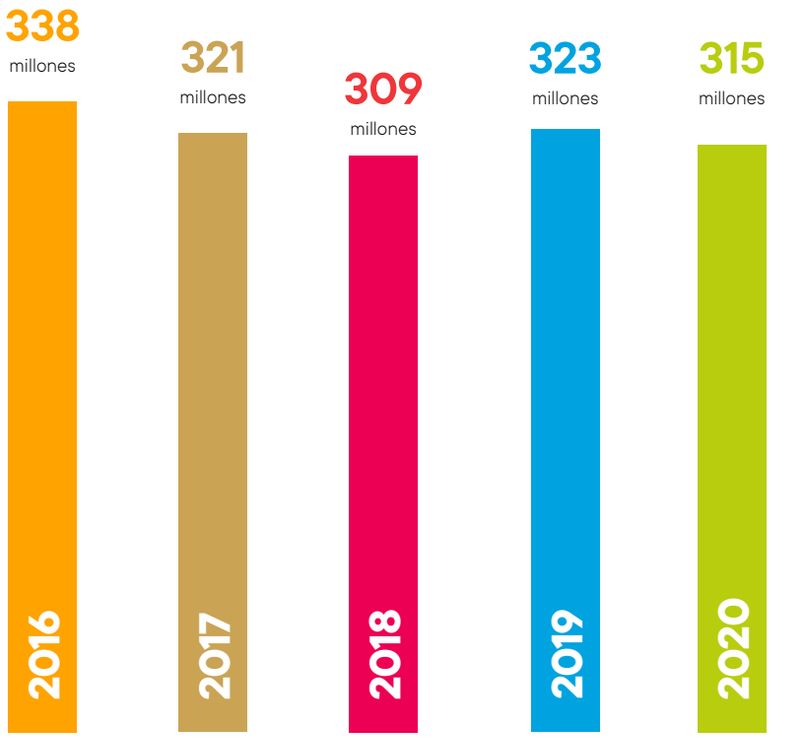
Empresas que dejan el cultivo

En un escenario así, con un cultivo que ya no está dando los retornos que había hace décadas atrás y donde la nueva 'estrella' es el arándano e incluso el aguacate, hay empresas que han anunciado su salida del cultivo. Una de ellas es Agrícola Chapi, que optó por acelerar su salida, programada para 2022. Hoy el 33% de sus campos están cubiertos con esta hortaliza, sin embargo, los márgenes de los otros cultivos que maneja: el aguacate y la uva de mesa, son mayores. También ha motivado esta decisión la competencia mexicana, que tiene costes operativos menores y está mucho más cerca del mercado más importante, Estados Unidos.
Hace unos años, Camposol había tomado la drástica decisión de 'matar' 2.000 hectáreas de espárragos, que fueron replantadas con arándanos, transformándose hoy el principal productor y exportador de este berry en el Perú.

Las empresas que permanecen quieren un renacer

Pero, como dice el dicho, 'a mal tiempo, buena cara'. Y eso lo saben bien los productores, sobre todo aquellos que aún confían en lo que puede seguir dando esta hortaliza a la agricultura peruana. Así es como están planeando nuevas técnicas de manejo y tecnologías para no perder competitividad en los mercados internacionales.
Una tendencia que se observa en Ica (al sur del país) es la instalación del cultivo a una mayor densidad. La decisión de ello pasa por explotar la planta en menos años, escapar de los daños que ocasiona el Fusarium y recuperar rápidamente la inversión. Así, si a mediados de los años ochenta del siglo pasado, cuando se cultivaron las primeras esparragueras en Ica, se hicieron a una densidad de 16.000 plantas/ha, a inicios del 2000 esta era de 25.000 plantas/ha y, desde hace unas campañas que se está sembrando a 30.000 plantas/ha, con serias intensiones de llegar a las 36.000 plantas/ha.
Si de variedades se trata, en Ica y tan solo hasta hace unos años, los campos estaban cubiertos con dos variedades principalmente: UC 157 y Atlas. Sin embargo, cada vez hay una mayor área sembrada con UC 115 (DePaoli), que ha encontrado en algunas zonas de esta región el lugar ideal para su desarrollo. Se trata de una variedad flexible, capaz de adaptarse a diferentes suelos y climas.
Hay quienes proponen darle un impulso a la producción peruana, de la mano de nueva genética de otros orígenes. Así, por ejemplo, a Chile entraron con fuerzas las variedades súper machos de la Universidad de Rutgers (Estados Unidos) y la Universidad de Guelph (Canadá). Es una alternativa que podrían estudiar los productores peruanos, recomiendan los especialistas.
Sin embargo, para muchos, el principal desafío para la industria esparraguera peruana es aumentar la vida de poscosecha de esta hortaliza, que hoy está entre 14 y 18 días para los calibres delgados y 21 a 25 días para los calibres más gruesos. Los expertos señalan que, si es posible extenderla a 35 días, se podrían ahorrar costos de transporte y lograr mejores precios.
Por ello es que hay empresas del sector que han realizado ensayos con compuestos naturales que cubren a la hortaliza, evitando así la deshidratación de esta, permitiendo también que la base cortada del espárrago absorba las soluciones. El panorama en el recién pasado 2020 estuvo combulsionado, como lo ha estado en las diferentes zonas productoras del planeta, pero en Perú, quienes siguen en el negocio, confían en que esta hortaliza aún tiene futuro en el país. *AW*

EVOLUCIÓN DE LAS EXPORTACIONES DE ESPÁRRAGOS FRESCOS (EN MILLONES DE EUROS)



Fuente: Elaboración propia con datos de Sunat.

MAPA DE LA PRODUCCIÓN DE ESPÁRRAGOS FRESCOS EN PERÚ

Ica es una de las principales zonas productoras y junto a La Libertad, las más importantes del Perú.

En pos de la **deseada recuperación**

© Danper

Si bien la producción de espárrago peruano en 2020 cayó un 4%, los pronósticos para este año son más optimistas.

BY NADIA VENTICINQUE

La estricta cuarentena impuesta por el gobierno nacional para combatir la pandemia, sumado a los disturbios sociales y los bloqueos en las principales carreteras hacia fin de año en las regiones de Ica y La Libertad que crearon una reducción en la asistencia de trabajadores y restricciones logísticas, particularmente al evitar la recogida de contenedores de espárragos para su envío al exterior, golpearon la producción y las exportaciones de espárrago peruano durante el 2020. No obstante, hay buenas noticias para los mercados del espárrago peruano, pues las previsiones para 2021 del USDA pronostican alcanzar una producción de 370.000 toneladas, es decir, +5% en comparación al año anterior.

MORE INFO

El espárrago peruano vive su etapa de madurez con márgenes cada vez más pequeños, forzando a que muchas empresas dejen el cultivo y se queden solo aquellas que mejor manejo han demostrado.

Según el sitio de estadísticas Agrodata Perú, en 2020, Perú exportó 8.800 ton de espárragos congelados, un 10% menos que en 2019. El principal mercado fue Estados Unidos, seguido por Japón, España, Bélgica, Alemania y Corea del Sur. Probablemente, estas cifras se mantendrán estables en 2021.

En el caso de los espárragos frescos en 2020, las exportaciones totalizaron 130.000 ton lo que significó -1% en comparación al 2019. Estados Unidos fue el principal destino de los envíos, seguido por Reino Unido, Holanda, España, Canadá, Bélgica y Brasil. Las proyecciones de USDA indican que las exportaciones del fresco en 2021 se recuperarán, alcanzando las 138.000 toneladas. AW

Complejo Agroindustrial Beta

versatilidad, eficiencia y la mejor calidad

Pese a los desafíos del 2020, Complejo Agroindustrial Beta, pudo salir adelante. "Entendemos bien el negocio y nuestras claves son: la estabilidad, la capacidad de controlar variables, la mejorara continua y capacidad de adaptarnos a los cambios. Priorizamos programas y volúmenes pactados para todo el año; negociamos espacios logísticos con antelación; y trabajamos arduamente para mejorar eficiencias en campo y planta. Asimismo, seguimos apostando por nuestros socios estratégicos en los canales retail y mayorista, así como en nuestra oficina comercial en España" dijo el Subgerente Comercial Denys Sam, quien aseguró que la empresa seguirá apostando por el espárrago. "Vemos potencial para crecer. Seguiremos invirtiendo en nuevas variedades y expandiendo nuestra oferta en más mercados. Asimismo, hemos creamos más productos con valor agregado, como lo son los materiales ecológicos y reciclables. Esta versatilidad, nos permite seguir adaptándonos a esta nueva realidad, ofreciéndole al cliente productos de altísima calidad" asegura Sam.

Complejo Agroindustrial Beta cuenta con 26 años de experiencia, una superficie de 2,000 hectáreas de espárragos en Perú y producción propia de 25 millones de kilos anuales para asegurar, todo el año, un abastecimiento de espárrago fresco y congelado, a más de 38 países.

© Complejo Agroindustrial Beta

Danper

aumenta sus envíos por vía marítima

© Eurofresh Distribution

Para Danper, el énfasis en la estrategia logística, ha sido una de las claves para lidiar la crisis del 2020. De las 14,000 toneladas de esparrago verde que exportan, el 70% es producto fresco y, el resto, para conserva y congelado. Si en 2019, el 80% era exportado vía flete aéreo y 15% marítimo, en el año de la pandemia, eso cambió. Ahora Danper solo envía 40% por avión y 60% por barco. "La logística se ha vuelto un jugador esencial y estamos contentos de haber llegado a buenos acuerdos, para exportar con rapidez y competitividad" explica Jorge Aranguri, Chairman de Danper. La seguridad alimentaria y salud de los trabajadores también preocupa a la empresa, que ha desarrollado desde hace décadas una cultura basada en el "Valor Compartido", con la operación centrada en las personas y la estrategia orientada hacia los clientes. Rosario Bazán, CEO de Danper, lidera el gremio de las empresas agroexportadoras de la irrigación Chavimochic que, recientemente, equipó un hospital Covid en Virú.

Danper, que por 27 años ha sido la empresa líder en la agro exportación de espárrago peruano, ha iniciado el camino hacia la diversificación, que comenzó con alcachofas, piquillo y ahora, también, con mango, aguacate y arándanos.

I produttori italiani investono ancora sull'asparago

In Italia quest'anno la superficie in produzione è stimata in circa 9.500/9.800 ha . A questi bisogna aggiungere circa 1000 ettari di giovani impianti che attendono di entrare in produzione.

Risulta in aumento anche domanda di asparagi verdi per il mercato estero, meglio se biologici.

BY LUCIANO TRENTINI

Quella dell'asparago è una coltivazione che mantiene un trend che consideriamo tuttora positivo sotto il profilo commerciale visto l'andamento crescente della domanda da parte dei consumatori per tutte le tipologie di asparagi, verdi, bianchi e violetti. Gli investimenti in questo ultimo biennio,soprattutto nel Sud dell'Italia hanno subito una flessione già a partire dal2019, protrattasi anche nel 2020 poiché aggravata dai problemi commerciali connessi alla pandemia da Coronavirus. La motivazione del calo delle superfici investite ad asparago nel Sud Italia trova una motivazione legata sia ad aspetti agronomici, che ambientali, che hanno avuto ripercussioni negative sul reddito delle imprese. Come sanno bene i produttori di asparago le quantità raccolte oltre che dalla tecnica colturale, sono influenzate in maniera determinante dalla scelta della varietà da coltivare. Purtroppo in questi ultimi anni, il proliferare di nuove varietà, spesso non verificate sperimentalmente per longevità e produttività, hanno costretto i produttori a distruggere gli impianti a causa dello scarso reddito provocato delle basse produzioni.

Luciano Trentini,
Asparagus consultant

La Era post-covid 19

Nel 2020 la pandemia ha comportato la chiusura di bar ristoranti e mense (Horeca e ristorazione) e questo ha contribuito a ridurre il consumo di asparagi non solo freschi, ma anche conservati e surgelati . Solo la commercializzazione verso la GDO e l'export hanno consentito vendite pressoché normali .Sempre nel 2020 la difficoltà di reperire la manodopera ha avuto un peso notevole sulle decisioni degli agricoltori di ridurre gli investimenti ed anche sulla decisione di abbandonare la raccolta in impianti giovani. A complicare ulteriormente la situazione è stato l'andamento climatico negativo degli ultimi anni caratterizzato da primavere siccitose e frequenti gelate come nel 2020 che hanno in parte compromesso la produzione. Anche per questa campagna 2021 la situazione soprattutto in Puglia dove si coltivano circa il 50 % degli asparagi italiani è difficile. Gli abbassamenti termici e le abbondanti piogge stanno, come nell'annata precedente, nuovamente ritardando la raccolta compromettendo ancora una volta le rese produttive. Al momento, per carenza di prodotto i prezzi di mercato sono buoni ma si teme un abbassamento dei prezzi di mercato se si verificherà la temuta concentrazione di produzione fra gli areali produttivi del Nord e del Sud Italia per effetto degli andamenti climatici avversi, in analogia al 2021 quando le gelate tardive colpirono duramente.

I asparagi italiani in numeri

In Italia quest'anno la superficie in produzione è stimata in circa 9.500/9.800 ha . A questi bisogna aggiungere circa 1000 ettari di giovani impianti che attendono di entrare in produzione. Gli asparagi bianchi che rappresentano poco meno del 20%

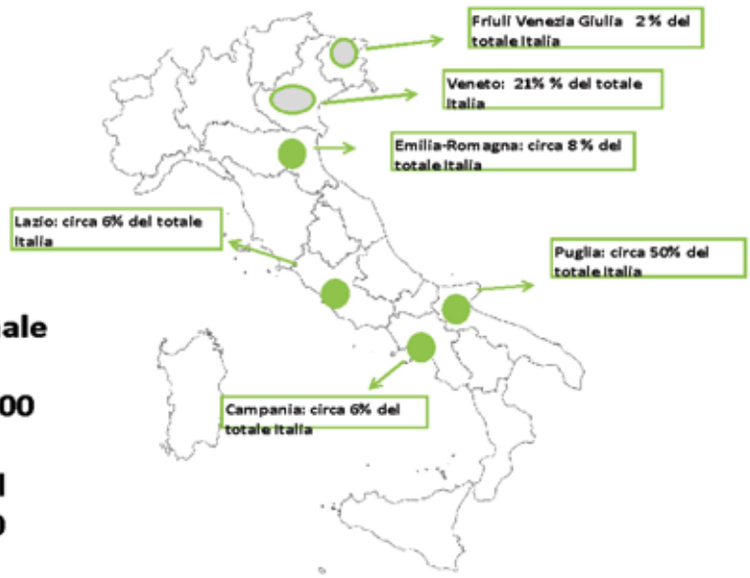
ABSTRACT

Italian producers struggle with multiple challenges

Despite agronomic and environmental issues, asparagus of all colours continue to attract growing demand in Italy, as well as in foreign markets, especially for organic. However, investment in the south of Italy has fallen in the past two years, a situation aggravated by the current pandemic. One reason is the proliferation of poor-yielding new varieties, often not tested experimentally, which have forced producers to destroy their plants due to the low returns. The dry springs and frequent frosts of recent years have compounded the situation. Once again this year, Puglia (where about 50% of Italian asparagus is grown) is facing a difficult campaign due to lower temperatures and heavy rains delaying harvest and compromising yields. The current lack of product means that market prices are good, but the fear remains that they will slump if northern and southern crops overlap. During the pandemic, the closure of the food service channel has led to a drop in consumption of fresh, preserved and frozen asparagus. RW

dell'intera superficie nazionale, sono presenti solo in due regioni italiane più precisamente in Veneto ed in Friuli Venezia Giulia . Gli asparagi viola (il più conosciuto è il Violetto d'Albenga) sono coltivati quasi esclusivamente in Liguria. A trainare la produzione nazionale sono sempre gli asparagi verdi di Puglia che oggi rappresentano ancora livelli produttivi superiori ai 5.000ettari, in Veneto si coltivano circa 2000 ha di asparagi verdi e bianchi(70%) . In Emilia-Romagna (circa 750 ettari) e in Lazio (500 ettari). In Campania la coltura interessa oltre 400 ettari di asparagi verdi coltivati prevalentemente in serra. In Friuli Venezia Giulia si coltivano circa 200 ettari dei quali il 70 % bianchi. Si può affermare che per questa campagna 2021, la superficie a livello nazionale rispetto al 2020 è diminuita di circa un 10% . La riduzione più marcata si è verificata al sud dove il calo è stimato molto vicino al 15 % . Stabile invece la produzione nelle regioni minori ed in Campania e nel Nord, dove si ha qualche nuovo investimento . In leggero aumento la produzione di asparagi precoci riscaldati o con acque geotermiche come il Veneto, in Friuli Venezia Giulia e nel Lazio, ma vi sono prove in atto che prevedono di impiegare acque riscaldate da energie rinnovabili o come nel caso di un recentissimo e nuovo impianto, che utilizza come fonte energetica la energia elettrica. *AW*

Le principali regioni Italiane produttrici di asparagi in Italia nel 2021.



La superficie nazionale in produzione è stimata in circa 9 .500 ettari circa. Una riduzione media del 10% rispetto al 2020

L'Asparago Violetto di Albenga

Presidio Slow Food

Coltivato sulla riviera ligure dal XIV secolo, l'Asparago Violetto di Albenga è diventato nel 2000 Presidio Slow Food, un evento che lo ha preservato dall'estinzione a causa dell'orientamento di molti produttori verso colture con cicli più brevi. Questa varietà unica al mondo, é praticamente inimitabile e inconfondibile per i turioni medio-grossi e per il colore viola intenso che gradatamente sfuma scendendo verso la base. Si produce nella Piana di Albenga, caratterizzati da un profondo strato sabbioso e limoso e da un particolare microclima che gli conferiscono un gusto delicato, consistenza morbida anche grazie alla assenza di fibrosità che consente di consumare l'intero asparago. "La coltivazione del Violetto è completamente manuale e la raccolta avviene da metà marzo a metà giugno, così arriva più tardi alla vendita" spiega Marialuisa Parodi Montano, referente dei produttori del Presidio. Oggie, l'Asparago Violetto di Albenga è estremamente richiesto da utilizzatori di alta gamma come il canale Horeca di lusso.

Asparago Verde di Altedo IGP

il gusto più intenso e marcato

Nato nel 2003, il Consorzio di Tutela dell'Asparago Verde di Altedo IGP tutela la produzione di asparagi verdi di varietà autorizzate nella bassa Pianura Padana tra le province di Bologna e Ferrara. L'Asparago Verde di Altedo IGP è prodotto esclusivamente in terreni che sono ritenuti vocati alla sua coltivazione e per questo presenta caratteristiche uniformi quale che sia il suo comune di provenienza. Si tratta di terreni sabbiosi, leggeri, ricchi di azoto e di potassio che conferiscono al prodotto le sue peculiari caratteristiche e il suo gusto intenso e marcato. "Oggi l'Asparago Verde di Altedo IGP è un prodotto d'eccellenza la cui fama, tramite il passaparola e la promozione nella ristorazione d'alta gamma in Italia e all'estero, è estesa in tutto il mondo. La domanda attualmente supera l'offerta, e che è richiestissimo non solo dalla GDO italiana ma anche su mercati internazionali dell'Europa centrale e settentrionale e della Russia" spiega il presidente Gianni Cesari.

L'Asparago Verde di Canino

in attesa della IGP

Ancora non è certificato IGP, ma l'Asparago Verde di Canino è già sulla buona strada con la richiesta. Queste asparago è caratterizzato da un colore verde assai più brillante degli altri asparagi e da assenza di fibrosità. "Il terreno vulcanico delle zone, ricco di risorse geotermiche, non solo conferisce al prodotto un'estrema ricchezza di minerali come potassio, calcio, magnesio e ferro che lo rendono un elemento altamente nutritivo, ma ci consente, tramite l'impiego delle acque calde, di anticipare il raccolto all'inizio di febbraio" spiegano Giancarlo Benella direttore della cooperativa COPA Canino che è capofila del progetto per l'ottenimento della IGP, progetto rivolto a tutte le aziende dell'areale della Maremma tosco-laziale – Canino ma anche Tarquinia, Montalto di Castro, Tuscania e altri comuni della zona – in un'areale che potenzialmente può produrre sui 20000 quintali all'anno di asparagi. IL prodotto IGP è indirizzato verso la GDO nel Nord Italia, ma anche verso l'estero, soprattutto in Germania, , Francia e penisola scandinava, e persino a Dubai.

L'Asparago Bianco di Zambana De.Co.

tenerezza e dolcesa, tutto insieme

Nata nel 2006, la Denominazione Comunale d'Origine (De.Co.) dell'Asparago Bianco di Zambana disciplina la produzione di asparagi nella Provincia di Trento: "Il nostro territorio è caratterizzato da terreni di riporto dei fiumi Noce e Adige, e pertanto estremamente limosi e leggeri il che li rende particolarmente adatti alla produzione dell'asparago. Inoltre il clima, segna sempre una differenza di 1–2 gradi rispetto al centro-valle. Il risultato è un asparago dal sapore molto dolce, privo di retrogusti amarognoli, e di grande tenerezza, che si inizia a raccogliere ai primi di aprile fino alla metà di giugno" spiega Willy Moser, presidente del Consorzio. Circa 12 aziende aderenti al disciplinare mettono in circolazione 450–500 quintali di prodotto all'anno, mentre si sta valutando la nuova zona di appartenenza del marchio, nel territorio di Terre d'Adige. Una produzione che al momento è destinata prevalentemente al mercato locale e nella GDO del Nord Italia e guarda con interesse alla possibilità di espandersi in altri mercati nazionali ed esteri.

L'Asparago Bianco e Verde di Badoere IGP

coltivato lungo il corso del fiume Sile

Il'Asparago Bianco e Verde di Badoere IGP nel 2010 ha ottenuto il riconoscimento IGP. Grazie alle caratteristiche dei terreni alluvionali della piana del fiume Sile, acquisisce un gusto estremamente dolce è anche privo di fibrosità: in pratica è uno dei pochi asparagi che si possono consumare per intero. "Fino a oggi, la produzione ha riguardato le principali varietà bianche e verdi come Dariana, Zeno, Eros e altre, ma da un paio d'anni siamo impegnati nella modifica del disciplinare per includere altre nuove varietà" spiega il presidente del Consorzio Carlo Benozzi. Attualmente associate al Consorzio sono circa 30 soci sparse in 15 comuni tra le province di Treviso, Padova e Venezia, lungo il corso del Sile, che annualmente immettono sul mercato 600–700 quintali di prodotto a marchio. Recentemente l'interesse per l'Asparago di Badoere è aumentato, richiamando nuovi acquirenti tra cui alcuni mercati interessanti come il Nord Europa ma soprattutto il Giappone e l'Australia, mentre il verde è destinato perlopiù alla GDO dell'Italia centro-settentrionale.

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New varieties could be key to better future for NZ growers

New Zealand's asparagus industry is currently going through a very challenging time, with very low returns for growers.

BY JULIE BUTLER @FreshScribe

© Tendertips

For the 2021 season, harvesting labour will be the biggest challenge with border restrictions likely to still be in place due to Covid-19.

Asparagus growers in New Zealand are looking to higher yielding overseas varieties so they can reduce their planted areas and thus lower their costs. According to Cam Lewis, managing director of Lewis Farms, which includes the family-owned asparagus and strawberry supplier Tendertips, this has become necessary because the minimum wage has increased considerably over the last few years in New Zealand and growers have not yet been able to pass on this cost. "This has led to NZ asparagus becoming uncompetitive in the international marketplace when competing with asparagus from much lower labour-rate countries. In the 2020 season, NZ exported very little asparagus for this reason. Until new export markets are found or the volume of asparagus produced in NZ reduces, the NZ domestic market is in an oversupplied situation which is then seeing very low returns back to growers," Lewis said.

> **"This has led to NZ asparagus becoming uncompetitive in the international marketplace when competing with asparagus from much lower labour-rate countries."**

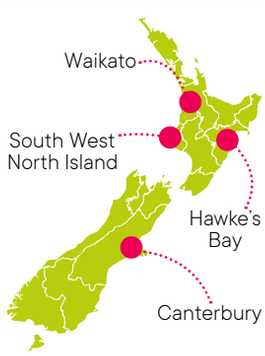
Labour will also be a challenge in NZ this year

The main asparagus growing regions in NZ are Waikato, Canterbury, South West North Island and Hawke's Bay and the harvest season, with around 100 days of daily handpicking, is generally between mid-September and Christmas. The 2020 season was colder than normal in NZ's lower North Island, where Tendertips and fellow asparagus grower Mangaweka are located, but the other asparagus regions of Waikato, Hawkes Bay and Canterbury experienced very good spring weather. "Overall, I would think that the NZ growers produced a normal amount of green asparagus, around 2,000 tons," Lewis said. "A small amount of this would have gone to processing (for canning), a small amount to export, and the rest to supply the NZ home market. For our 2021 season, harvesting labour will be the biggest challenge (as it is for growers right across the world) with border restrictions likely to still be in place due to Covid-19. What is in the NZ asparagus industry's favour is that the big NZ horticultural products – apples, kiwifruit and wine – do not have large demands for labour during the asparagus harvest period," he said.

Temperate climate helps produce sweet spears

Located in Levin, Manawatu-Wanganui, around 95km north of New Zealand capital Wellington, Tendertips benefits from the temperate growing climate of the Horowhenua district. Lewis credits the latter for the sweet flavour profile of his asparagus, something much appreciated by Japanese customers. Tendertips grows a number of different green varieties as well as purple, but not white, asparagus. It grows on a number of blocks in the Himitangi, Foxton and Poroutawhao areas, all within 20 km of its packhouse. "The geographical spread of crops provides some protection against isolated climatic events," Lewis said. During the season, Tendertips asparagus is available throughout NZ, dispatched fresh daily to supermarkets and also sold direct to the public from the packhouse shop. Tendertips holds NewZealandGAP certification, a GLOBALG.A.P. equivalent denoting safe and sustainable production.

THE MAIN ASPARAGUS GROWING REGIONS IN NZ



Home market most important for NZ asparagus industry

New Zealand has 35 asparagus growers but around 5 of them usually account for 90% of NZ's total annual crop, which is 2,000 tons from a planted area of about 560 ha. Their main market is NZ itself, with domestic sales in 2018 of NZ$8.6 million, and fresh exports worth $0.5 million (fob), according to FreshFacts NZ Horticulture 2019. The spears are sold either straight from the field or packed to some degree – washed, trimmed and graded, bunched or bagged. New Zealand asparagus growers may be registered with NZGAP or Growsafe Certified. Exports – usually by air in 5-10 kg boxes – sometimes add around half a million dollars in sales and are mainly to high value international markets, primarily Japan, but also Singapore, with smaller amounts to other countries including the Pacific Islands and Australia. However, they are of course affected by factors including the exchange rates between the NZ dollar and the currency in the export market. In the past, temporary labourers employed under New Zealand's Recognised Seasonal Employer (RSE) scheme made up about one third of the asparagus sector's seasonal workforce, accounting for about 134 RSE workers in the 2020 season. AW

"Okay" season expected in Britain

Lockdown rules are easing in the UK but not soon enough for asparagus growers

BY JULIE BUTLER @FreshScribe

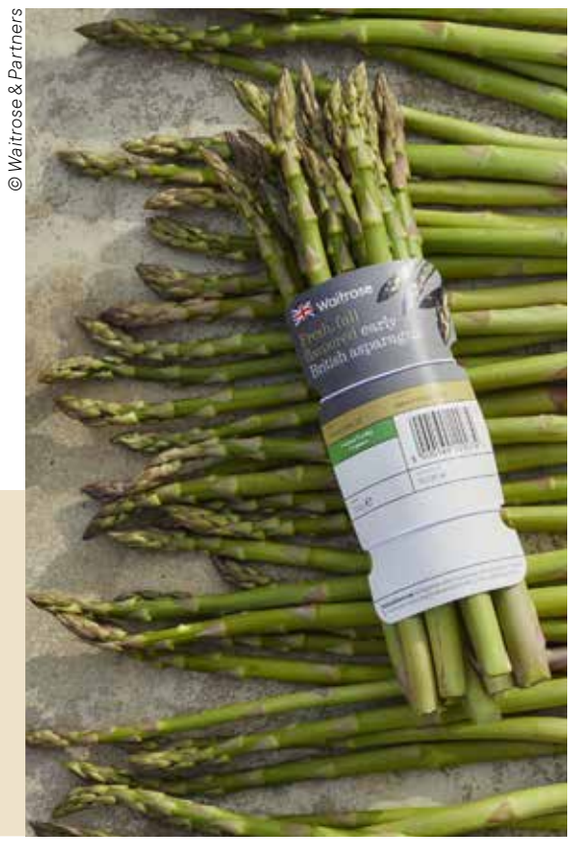
British asparagus growers were hoping retailers would help roll out the red carpet for the official start of their asparagus season on April 23 – St. George's Day.
Normally the country's chefs provide some fanfare but with lockdown rules limiting food service, it was hoped supermarkets – especially for online sales – would join the Asparagus Growers' Association in promoting the locally grown, in-season delicacy. From April 12, England's pubs and restaurants could once again open for customers seated outside and, if coronavirus goals are being met, from mid-May customers will be able to eat inside, but it won't be until the end of the official season, on June 21, that all legal limits on social contact could be removed.

Price rises hurt asparagus sales last year

Another challenge facing Britain's asparagus industry is that sales of fresh asparagus at retail dropped 3% YoY in volume last year to just under 10,400 tons, though the spend came in 5.2% higher at nearly £92.2 million. In contrast, over the same 52 weeks to December 27, 2020, the volume of all unprepared veg sold at retail was up 14% and the spend 10.5%. Joe Shaw Roberts, consumer insight director at Kantar, said: "In a year of unprecedented demand for fresh fruit and veg, sales of asparagus in British supermarkets appear somewhat sluggish. Though many of us were home cooking more than ever before, it was a tough 2020 for the industry as a disappointing growing season meant availability was low and prices rose by 13% to £8.99 per kilogram. This led to shoppers choosing other options, especially as the broader fresh vegetables market saw a 3.8% decline in prices to £1.46 per kilogram." Shaw Roberts said Tesco, however, bucked the trend and actually gained asparagus buyers in the 12 weeks to 14 June 2020 – the peak harvest time for the crop. "The supermarket secured enough product to run a multibuy deal on asparagus tips, giving it an edge over the competition. As a result, Tesco was able to encourage even more shoppers to purchase asparagus than the year before," he said.

Reasons to expect an okay season, at least

Though the British season officially starts April 23, Waitrose boasted it was "the first UK supermarket to welcome new season British asparagus to its shelves." From February 24 it sold British spears – at £3.50 for 200 g – in selected shops. Waitrose vegetable buyer Lucy Broughton said the early crop, grown near the south coast of England, was of the Gijnlim variety and available earlier due to the local climate (increased light levels and warmer temperatures) and advanced techniques. The latter include growing the asparagus in raised beds covered by a combination of black and white fleece tunnels over each bed to increase the plants' core temperature. The substrate is also covered on the sides with black ground cover and a very thin black membrane. Searches for asparagus are up 667% YoY on Waitrose.com, the retailer also reports, with popular recipes including Green baked eggs with new season asparagus; Asparagus, lemon & pecorino pasta; and Classic pea & asparagus risotto with sage butter. As for volumes this season, Chris Chinn from Cobrey Farms, the UK's largest asparagus grower, told Fresh Plaza in late March it was hard to predict: "But they should be better than last year when we had a very warm spring which made for a hard end to the season, this winter was also better than last year. We don't expect a bumper crop, but it should be okay." *AW*



© Waitrose & Partners

Though the British season officially starts April 23, Waitrose boasted it was "the first UK supermarket to welcome new season British asparagus to its shelves– at £3.50 for 200 g – in selected shops.

> **"Searches for asparagus are up 667% YoY on Waitrose.com, including popular recipes."**

The French asparagus sector is increasingly dynamic

France is expanding its asparagus production, concentrating its offering, and increasing market share.

BY GUY DUBON @ReussirFL

© AOP Asperges de France

Asparagus in France has enjoyed favourable technical and commercial dynamics over the past ten years. However, as the Covid crisis hit the last campaign rather hard, the French retail sector has rallied in support to promote asparagus consumption.

Organisational dynamics

Some consumers are discovering this vegetable for the first time, as revealed by Kantar panel figures. The number of French households buying asparagus increased by 11 percentage points in 2020, rising to 31% from a previously stable 20% since 2017. The challenge now is to maintain this momentum in 2021, an apparently achievable goal judging from the performance in the current campaign. French production is developing strongly in different areas. In 2021, Planasa joined the National Association of Asparagus of France and entrusted the marketing of 700 tons of asparagus produced on 170 hectares to its new commercial partner Priméale. There has also been an increase in the production of green asparagus, particularly in the south of France and under cover. The National Association of Asparagus of France comprises seven member groups spread over the south-western basins (Copadax, Maisadour, Tutiac and Planasa Vignerons), the Loire Valley (Fleuron D'Anjou) and the south-east (Cofruid'oc and Arterris). Sales during the 2021 season are expected to exceed 6,000 tons of asparagus, with white and purple varieties dominating. The association accounts for around 30% of the estimated 20,000 tons of production in France, and its share is growing. It is estimated that the French consume about 28,000 tons of asparagus each year, which leaves room for imports, especially Spanish green asparagus which is sold at very competitive prices in relation to French production costs.

Forthcoming ban on plastic packaging

However, French asparagus holds a significant commercial advantage in the form of its French origin designation and its local distribution. Market analysis reveals the prominence of French product on supermarket shelves thanks to the numerous communication campaigns carried out by Asparagus de France in the media (radio, TV), at points of sale and on social networks. In France, asparagus is sold in a variety of packaging, in 4 kg and 1 kg packs, in 0.5 kg bunches and in 0.5 kg flow-pack plastic bags. However, as of January 1, 2022, the AGEC Act (a law to tackle waste in the circular economy) will prohibit the use of plastic packaging for sales units of less than 1.5 kg. Asparagus will be affected, but a waiver request has been made to extend the deadline to 2025. The asparagus industry is currently looking for solutions. AW

French asparagus holds a significant commercial advantage in the form of its French origin designation and its local distribution.

Fleuron d'Anjou

harbouring ambitions for the Loire Valley

Traditionally cultivated in the Maine and Loire region, asparagus constitutes a strategic product for the Fleuron d'Anjou cooperative, which plans to increase production to 1,000 tons on 200 hectares within 2 years. Beyond planting dynamics, volumes have risen three-fold since 2015, thanks to strength in several areas, including the commitment of the group of asparagus specialists and the arrival of some young producers. The firm's technical support, its implementation of new protocols and its marketing expertise have been reinforced by investments in production and stations. Fleuron d'Anjou's offering is early, diversified and committed (20% organic and soon to be certified with HEV (High Environmental Value)). In order to meet gastronomic demands, work is currently being undertaken to develop the taste and storage life of asparagus as part of the project to promote the Val de Loire origin.

Priméale

meeting environmental expectations

Priméale is the leading French marketer of asparagus marketing 5000 tons out of the 20,000 tons of national production. "Priméale was already marketing Copadax and MaïsAdour asparagus. In 2021, Planasa was added to increase our offering with an additional 700 tons," said Bertrand Guivarch, Commercial Director. "In 2020, with the health constraints due to Covid-19, the share of asparagus sold in bags increased. We sell 45% in a 500 g flow packs and 55% in 5kg packs," he says. However, the use of this fresh pouch made of polypropylene with selective permeability has been called into question in the shorter or longer term (see above). "For this season, we are testing a new bag made of 60% paper with a transparent window to maintain the visibility of the product, the number one sales criterion," says Angélique Aubry, Head of Advertising Marketing. "It's one way of meeting consumers' environmental expectations, even if this recyclable alternative, doesn't meet the requirements of future legislation," she says.

Larrère

asparagus from the Atlantic coast

"At Larrere farms we produce organic asparagus. Fully committed into a CSR approach, the respect of nature, soils and plants is essential for us," said Patrick Larrère. "Our family farms are located in the heart of Les Landes in France, which is an historical production basin for asparagus growing. In order to extend our production season and to offer to our customers asparagus from January, we started to grow asparagus in our farm BVLH which is located in Comporta in the Alentejo region in Portugal. We chose this region because it is an area which has some very unique geological and climatic conditions, similar to what he have in Les Landes. In both of our farms, the asparagus fields are very close to the Atlantic coast, around ten kilometres from the ocean, and are surrounded by pine forests. The soils are mainly made up of a very clear sand which is typical of those regions. Those soils allow us to cultivate a product of excellence with a strong flavour typicality and sweet aromatic notes. Today Larrere Farms are already well established on local and French markets but we have the ambition to continue to develop exports by creating partnerships at European and international levels."

C'ZON

green asparagus in season

Import Direct Service, the head of the C'ZON brand, is an import-export company for ready-to-use fresh fruits and vegetables. It has only one conviction: to work directly with agricultural producers all over the world with the aim of bringing consumers a product that has naturally reached maturity. Acting in a short circuit, but not only, it also aims to charge a fixed price all year round on fresh products, without additives or preservatives, and with flawless traceability. In bundles or in trays, asparagus has always been a key reference for this SME, which has been established in northern France since 2001. And recently, C'ZON launched a fine green asparagus from France. This is an opportunity to expand its range and meet new customer needs that have been considerably felt since the arrival of the pandemic. This new asparagus comes from a local production in the North of France, a GLOBALG.A.P. certified production, like all the fruits and vegetables of the brand. (certification guaranteeing the use of good agricultural practices as well as maximum safety of the food products offered by the distributors). It is hand-picked when ripe and has proven itself to be a good choice for customers.
A new product that has already won over customers and that bodes well for the future.

This is **post-Covid!**

After a year under the shadow of the Covid-19 pandemic and with a new campaign underway, the asparagus industry is proving capable of organising the necessary manpower, and aims to capitalise on the growth in consumption.

BY JULIE BUTLER @FreshScribe

A year ago, the first wave of the Covid-19 epidemic struck just as the main asparagus season was commencing, significantly impacting the campaign in Europe, as testified by companies from France, Italy, Germany, the Netherlands and Spain. Across Europe, it has been shown that asparagus is highly dependent on manpower, which often comes from other countries. The health regulations put into place, and still in force today, meant changing the organisation of the production chain, harvesting, packaging and logistics. It also meant increases in these costs, which will have to be passed on to the final price.

The situation has led to producers focusing more on their domestic markets. With the restaurant sector on hold, asparagus has also lost an important outlet. This loss, though temporary, has already changed eating habits regarding asparagus. Consumers have been very receptive to fresh asparagus during this period, with some consuming it for the first time. It is now important to capitalise on this situation to increase the number of asparagus consumers in Europe.

MORE INFO

How Covid-19 affected production in 2020

In Mainland China, the world's top asparagus grower, the unprecedented market fluctuations and general negative impact caused by Covid-19 in 2020 saw its asparagus planted area decrease of 5% from 2019 to about 90,000 ha in 2020, according to a Fresh Plaza report quoting seed producer Walker Bros, Inc. In Peru, the Southern Hemisphere's top asparagus grower and global number two, production in 2020 fell 4% YoY to just over 352,300 tons due to a labor shortage during the harvest season, a result of the strict national quarantine imposed by the Government of Peru, says a USDA Gain report. And last year's asparagus harvest in Germany, the Northern Hemisphere's 2nd biggest grower after China, was about 117,650 tons, 10% down on 2019 and 5% lower than the average for the previous six years, according to the country's federal statistics office. Germany's lower harvest volume was partly due to a 2% decline in the acreage in production but was "also due to the fact that, as a result of the corona pandemic, there were no foreign harvest workers in some regions and therefore not all of the asparagus fields could be harvested," reported the Association of South German Asparagus and Strawberry Growers (VSSE).

GERMANY

Spargel und Beerenanbau Winkelmann GmbH & Co

Andreas Löbke, Production Manager

How has the pandemic affected your operations?

For the 2020 season we had a worker shortage of about 25%, especially women from Poland who decided to stay with their families. We understood and respected their decisions. In March 2020, much of what was happening was new and unknown and presented us with some challenges. Due to the great commitment of our staff, we were able to implement all the necessary hygiene measures in a short time. Disinfectants were organised from various sources, masks were sewn at employees' homes, the entire company premises were fenced off and guarded by a gatekeeper. We had 25% less production. But people who came working for us stayed for a longer period than usual, which helped. We have since learned to deal with the situation and have further tightened and improved our measures and hygiene standards. But the mutations with the higher infection rates worry us. In 2020, we had no infections on the farm. We hope that we will be able to do the same in 2021. We believe that customers are eagerly awaiting the first fresh asparagus and that sales in 2021 will be good.

© Beerenanbau Winkelmann GmbH & Co

How has it affected marketing, consumption and logistics?

None of our usual sales to gastronomy and canteen kitchen customers took place. Sales to food retailers worked well – but all on a lower base level. Our markets and our customer relationships have developed robustly, however. Consumers seemed to place more value on high-quality, fresh asparagus and ate a little more asparagus at home, maybe because they couldn't go out to restaurants. Our exports, mainly to Scandinavia, have remained stable. Our logistics partners were able to deliver everything as agreed. Our own logistics also functioned reliably.

The health regulations put into place meant changing the organisation of the production chain, harvesting, packaging and logistics.

ITALY

Apofruit

Mirco Zanelli, commercial director

How has the pandemic affected your operations?

The pandemic prompted Apofruit Group to adopt measures to protect its employees: the spaces dedicated to product processing have been expanded, additional specialist personnel have been recruited, processing lines have been equipped with safety devices such as plexiglass panels, and employees have been provided with protective masks in addition to normal PPE (gloves, caps and caps). In order to ensure the processing and marketing of the product, another processing line has been implemented at another of the group's plants. While we have had more difficulties hiring workers for harvesting, the quality of our asparagus is unchanged, divided as always into: Extra (40%), 1st Category (50%) and baby asparagus (10%), while our acreage has grown to 240 ha for a total production of 1,000 tons. And due to a new specification, which also covers some new varieties, the production of Apofruit's green Asparagus of Altedo PGI will be 30% higher this year on 2020.

© Apofruit

How has it affected marketing, consumption and logistics?

Last year's March-May lockdown reduced the purchase frequency for perishables like asparagus in favour of products with longer shelf life. This had a negative impact on the campaign in both supermarkets and general markets, but was worse for food service. Overall, our output was not overly high and was well spread out over the period, allowing for more regular marketing and avoiding production peaks that can cause price drops. In Switzerland, Germany and the Netherlands, consumption decreased and the presence of local production also affected export volumes. On the logistics front, we have witnessed a slight increase in road transportation costs, mainly due to the initial uncertainty and lack of means.

FRANCE

Priméale

Bertrand Guivarch, managing director

How has the pandemic affected your operations?

Labour posed few problems in 2020 in the early production zone because seasonal workers were present during the lockdown. In 2021, the travel protocols are well defined and allow the movement of workers. The new constraints require more supervision to respect distances and the use of equipment – we must ensure rules are respected for the safety of all. It's been necessary to halve the workstations on the graders. Despite a more rigorous organisation, packing station productivity is 20% lower. However, Priméale plans to market 5,000 tons in 2021, thanks to its new collaboration with Planasa France, which adds 700 tons.

© Réussir Fruits et Légumes

How has it affected marketing, consumption and logistics?

The first lockdown saw the restaurants close, and they are an important outlet for asparagus in France. But supermarkets rallied to offer asparagus to French consumers, some of whom discovered it for the first time. Kantar data shows the number of French households buying asparagus rose to 31% last year after sitting at 20% since 2017. It will be hard, but we think we can maintain this level in 2021. Covid-19 has also increased demand for proximity and local products, which favours our French asparagus. Last year, the share of asparagus sold in bags increased. We are selling 45% of our asparagus in 500 g flow packs and 55% in 5k g packs and this is due to the better health security of the flow pack and increased sales of asparagus in supermarkets. But from 2022, French law will forbid use of bags and plastic film for small sales units, which will mean the return to the bundle. The logistics of using paper bags are very difficult because there is currently no automation possible.

SPAIN

García Mateo & Sinova

Sergio Sinova, general manager

How has the pandemic affected your operations?

The availability of personnel has become one of the greatest challenges for all producers, regardless of origin, for various reasons: increased salary costs, restrictions on hiring foreign personnel due to limitations on international mobility to combat Covid-19, and increased personal space requirements for each worker to prevent contagion. All of this has resulted in fewer workers and lower productivity, or in extraordinary costs to adapt facilities to Covid-19 protocols. Like all companies, we have had to bear significant costs to adapt our facilities to Covid-19 protocols. Similarly, we've seen an increase in labour costs resulting from having to alternate personnel in our facilities, and we have had to constantly replace personnel in the event of Covid-19 infections. In addition, production rates have been reduced by having to prioritise space and reduce the number of workers in the warehouses.

© García Mateo

How has it affected marketing, consumption and logistics?

The food service restrictions diverted demand for fresh green asparagus to greengrocers and supermarkets. The 2020 Spanish campaign largely coincided with the March-May lockdown, which reduced fresh asparagus consumption, especially early in the campaign. The domestic and import campaigns don't overlap, so consumers don't have to choose between them. In fact, consumption during the domestic campaign makes them more likely to know the product and thus buy it more often the rest of the year. In the asparagus sector, the greatest impact of Covid-19 has been on air freight logistics for imported products. Prior to the pandemic, the vast majority of asparagus was sent to Europe on passenger planes, whose routes have been cancelled during the pandemic.

NETHERLANDS

Teboza

Will Teeuwen, owner

How has the pandemic affected your operations?

Just before the 2020 asparagus season, we were hit with lockdowns and closed borders in Europe which meant a significant amount of those who had worked at Teboza in past years were unable to return. With enormous effort by everyone in our organisation, we were able to fill the gap, such as by deploying workers from other sectors. This year, we have been in close contact with our employees, and we took control of the entire process from local testing before departure, safe travel and safe accommodation. We have also set up a test and quarantine policy in collaboration with the government and our health and safety officer. We see that after one year away, many people are happy to work with us again and we expect we'll have enough people to harvest and process every kilogram. The deployment of personnel from other sectors, small-scale accommodation, extra hygiene measures and more and small-scale transport have led to considerable additional costs in the past year, and will also lead to extra costs in the coming year and possibly the coming years.

© Teboza

How has it affected marketing, consumption and logistics?

As in most of Europe, in 2020 the catering industry was closed for almost all the asparagus season. As we expect a similar situation in 2021, our catering-related customers face another difficult year. However home consumption has been remarkably good and has offset the lower turnover. While sustainability in packaging has been an important theme in recent years, last year we saw that from a hygiene point of view, more asparagus was packed in plastic, such as flow packs and trays. We have not experienced any inconvenience with regard to the transport of our products to customers at home and abroad.

ADVERTORIAL

LOS Gallombares

Espárragos frescos todo el año

ENJOY THE BEST FRESH GREEN ASPARAGUS ALL YEAR ROUND

Agricultural cooperative Los Gallombares was founded in 1995 and is dedicated to cultivating and marketing fresh green asparagus in Poniente Granadino, in southern Spain. The cooperative can supply green asparagus throughout the year, thanks to imports from Peru and Mexico when there is no domestic production.

The cooperative currently has over 800 farmer members, whose strong commitment to their work is shown in their good production and great care for the environment. They have a combined production area in Spain of over 2,000 hectares and sell around 8 million kg of green asparagus per year, exporting it to more than 20 countries.

The Los Gallombares' mission is to offer its customers the characteristic flavour of fresh green asparagus with the highest quality possible. The cooperative is always adapting to its customers' needs, from presentation formats to providing the best quality service. What's more, around three-quarters of the materials used to package the green asparagus is 100% recyclable.

DISFRUTA DEL MEJOR ESPÁRRAGO VERDE FRESCO DURANTE TODO EL AÑO

Los Gallombares es una cooperativa agrícola fundada en 1995, dedicada al cultivo y comercialización del espárrago verde fresco en el Poniente Granadino, al sur de España. Ofrecen espárrago verde durante todo el año, gracias a la importación desde Perú y México, que está disponible en los meses que no existe producción nacional.

Actualmente, son miembros de la cooperativa más de 800 socios agricultores, cuyo alto grado de compromiso con su trabajo, se demuestra en buena producción y gran cuidado del medio ambiente. Juntos, reúnen más de 2000 hectáreas de producción, en el territorio español. Y comercializan en torno a 8 millones de kg de espárrago verde al año, que se exporta a más de 20 países.

Los Gallombares tiene como misión es ofrecer a sus clientes el sabor característico y la mayor calidad que puede obtener del espárrago verde fresco. Eso sí, siempre adaptándose a las necesidades que tengan los clientes, desde el formato hasta la presentación y dándole el mejor servicio que se pueda ofrecer. Adicionalmente, cerca de las tres cuartas partes de los materiales que se utilizan para la manipulación de su espárrago verde son 100% reciclables.

LA JOYA

LUXOR

LUXE

Los Gallombares S.C.A.

www.losgallombares.es / esp@losgallombares.es / +34 958 31 51 95

L'intérêt du **préemballé en sursis**

Le préemballage des asperges blanches en flow-pack permet d'allonger leur durée de vie. Mais son usage est remis en cause par la règlementation française concernant l'utilisation des emballages plastiques.

BY GUY DUBON @ReussirFL

L'asperge est un légume dont la respiration est particulièrement intense. Elle peut se déshydrater facilement ce qui entraîne une perte de poids très rapide. La perte d'eau génère la formation de stries qui déclassent rapidement le produit. Ce produit fragile peut perdre très rapidement en qualité. Une botte d'asperge non emballée peut présenter en magasin des symptômes de déshydratation marquée dès le deuxième jour. L'intensité respiratoire peut être limitée en conservant le produit à basse température et/ou en modifiant l'atmosphère.

Ralentir le flétrissement et la coloration

L'emballage des bottes d'asperge avec du film polypropylène microperforé permet de créer une atmosphère modifiée, réduisant la concentration en oxygène dans le sachet, sachant que ce conditionnement permet d'augmenter la durée de vie en magasin de plusieurs jours. Les essais mis en place entre 2011 et 2015 par le CTIFL[1] sur asperge blanche avaient pour objectifs de réduire la perte de poids, de ralentir le flétrissement et la coloration des turions, tout en minimisant la formation de buée dans les sachets lors de leur mise sur l'étal, ceci sans que le préemballage ne modifie les aspects de texture et de goût. Ces essais ont permis de montrer que le préemballage, quelle que soit la perméabilité testée (non perforé, macro et microperforé) limite considérablement la perte de poids au cours d'une conservation au point de vente. De plus, ils ont permis de définir une gamme de

L'emballage des bottes d'asperge avec du film polypropylène microperforé permet de réduire la concentration en oxygène dans le sachet permettant d'augmenter la durée de vie en magasin de plusieurs jours.

ABSTRACT

The interest of pre-packaged in reprieve

In France, studies carried out by CTIFL show that polypropylene bags can significantly limit the asparagus weight loss and extend its shelf life at the point of sale. However, they can change certain taste criteria (sweetness, bitterness, crunchiness, etc.). But their use is in question due to the coming French regulation concerning the use of plastic packaging.

Des séances d'analyse sensorielle ont permis d'évaluer les effets de l'emballage sur la majorité des descripteurs : croquant, fondant, fibreux, tendre, amer, granuleux et sucré.

perméabilité permettant de conserver les qualités visuelles des turions. Le choix de la perméabilité doit également permettre de maintenir la qualité organoleptique. Dans les conditions des différents essais, il apparaît que le conditionnement dans des sachets en polypropylène entraînerait une diminution de la perception du caractère sucré quelle que soit la perméabilité testée. La modalité non emballée est significativement perçue plus sucrée que les trois autres modalités, lorsque la simulation point de vente dure huit jours. En revanche, si la conservation au point de vente dure six jours, seule la modalité non perforée est significativement moins sucrée que les trois autres. Sur le caractère amer, qui vient en opposition du sucré, l'influence de l'emballage est également mise en évidence. Il y a une augmentation croissante de l'amertume perçue corrélée à la diminution de la perméabilité. La modalité non perforée est significativement plus amère que le produit frais. Pour le caractère croquant, le « classement » des modalités est le même : l'emballage le plus imperméable entraîne une perte de croquant. On constate également que le préemballage dans un film macroperforé génère une hausse du caractère croquant de manière significative.

Une perméabilité s'est avérée optimale

Pour le caractère fondant, qui vient en opposition du croquant, les conclusions vont dans le même sens : le produit frais est intermédiaire. Ainsi le préemballage dans un film macroperforé entraîne une perte du fondant (hausse du croquant constatée précédemment) et le préemballage dans un film imperméable produit une augmentation du fondant (baisse du croquant constatée précédemment). Concernant les caractères tendre et fibreux, on constate une logique d'opposition dans les classements des modalités. Ainsi, au cours de la conservation, les turions deviennent plus fibreux. Cette évolution est limitée par l'étanchéité croissante du film : la tendance est la même pour tous les essais réalisés. Les nombreuses modalités testées mettent en avant une gamme de perméabilités (de 3 $\mu m^2/cm^2$ à plus de 12 $\mu m^2/cm^2$) qui, dans les conditions particulières de ces essais (conditions de température de point de vente avec alternance jour/nuit), semblent être les mieux adaptées pour prolonger la conservation du produit avec une qualité acceptable (limitation du verdissement et de la perte de poids (0,5 à 1 %)). Ces essais montrent également les limites à partir desquelles on observe des défauts de conservation. Afin de garantir le maintien des critères organoleptiques (goût et texture), il est préférable d'éviter les perméabilités trop élevées comme celle testée via le film macroperforé. Ainsi, une perméabilité de l'ordre de 5 $\mu m^2/cm^2$ s'est avérée optimale. Avec des températures plus basses, la conservation est encore prolongée avec un optimum à 2 °C. Cette température utilisée au stockage permet de prolonger la conservation du produit au-delà de 15 jours, toutefois elle paraît très difficilement applicable sur le lieu de vente. *AW*

(1) Tiré de « Maintien de la qualité organoleptique ». AURORE MÉRY, MARIE-PIERRE CROUZET, CTIFL Publié dans INFOS CTIFL n°321 Le préemballage des asperges

Why Asparagus is among **the world's healthiest foods**

Asparagus spears are high in key nutrients, including vitamins, minerals and antioxidants

BY JULIE BUTLER
@FreshScribe

In August, it featured in WebMD's list of "12 Powerhouse Vegetables You Should Be Eating". And in December, a nutritionist listed it as one of "15 of the Healthiest Vegetables You Can Eat" in a Good Housekeeping article. Asparagus is even okay with the keto crowd, who welcome the fact it is filling, highly nutritious, and very low-carb. Furthermore, it is also low in saturated fat, very low in cholesterol, fibre-rich and low-calorie to boot. A 100 gram serving of cooked, boiled, drained asparagus (hereafter referred to as cooked) delivers only 22 calories, with carbohydrates contributing two-thirds of that energy, protein just over a quarter and fat the remaining 8%. In terms of weight, the vast majority of asparagus – over 92% – is water, 2.4% is protein, and 0.2% is fat (total lipids). While total carbohydrates account for 4.1%, 2% of that is fibre and just 1.3% simple sugars. Read on to find out what else makes this versatile vegetable so beneficial.

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Asparagus is not just a delicacy that delights the palate, it has many dietary benefits

Source: Flickr

Asparagus is packed with various vitamins and minerals

Based on data from the U.S. Department of Agriculture (USDA) Nutrient Data Laboratory, a 100 g cooked serving of this popular vegetable is an excellent source of Vitamin K, delivering 63% of the recommended daily value (DV). According to the UK National Health Service (NHS) website, Vitamin K refers to a group of fat-soluble vitamins that the body needs for blood clotting and helping wounds to heal, and there's also some evidence it may help keep bones healthy. Asparagus is also high (37% DV) in folate (Vit B9), which the NHS says helps the body form healthy red blood cells and reduces the risk of birth defects in unborn babies. Folate, and other B group vitamins, play a role in maintaining a healthy blood level of homocysteine, high levels of which are associated with increased risk of heart attack and stroke. A 100g serve of asparagus also delivers 20% of the DV for Vitamin A, as well as 13% for Vitamin C, Thiamin (Vit B1) 11%, Riboflavin (Vit B2) 8%, Vitamin E (7%), Niacin (Vit B3) 5%, Vitamin B6 (4%) and Pantothenic Acid (2%). Vitamin C is just one of the factors in the antioxidant properties of asparagus. Antioxidants neutralise free radicals – the chemical by-products that harm cell membranes and damage DNA.

Asparagus also a good source of essential minerals

Cooked asparagus also makes a valuable contribution to the dietary intake of necessary minerals, providing 9% of the DV of Selenium, 8% each for Copper and Manganese, Potassium 6%, Iron and Phosphorus 5% each, Zinc 4% Magnesium 3% and Calcium 2%. The NHS says Selenium

MORE INFO

What Britain says about health & its asparagus

British asparagus is packed full of goodness, so not only are you getting a delicious vegetable but a healthy one too.

- Eating asparagus promotes healthy bacteria in the large intestine and can help reduce bloating
- Asparagus contains vitamin K, essential for healthy blood clotting
- It is a rich source of vitamin C, which boosts your immune system
- Asparagus is a mild diuretic and is believed to help detoxify the body

Source: enjoyasparagus.com

helps the immune system work properly, as well as in reproduction. It also helps prevent damage to cells and tissues. Potassium, meanwhile, can be of particular value to people with hypertension, given high dietary potassium is associated with a decrease in blood pressure, particularly in the presence of a high-sodium diet. The NHS says Potassium helps control the balance of fluids in the body – one of the reasons asparagus is often touted as an anti-bloating superfood – and also helps the heart muscle work properly. In regard to the minerals in asparagus, it's interesting to note they are most concentrated in the upper sections of the spears.[1] It is also worth noting that green asparagus contains relatively higher nutritional components than white asparagus.[2]

Compounds with antioxidant and anticarcinogenic properties

Asparagus also contains a range of bioactives – compounds with actions in the body that may promote good health. Among these are flavonoids and other phenols which have been of particular interest to researchers for their antioxidant and potential anticarcinogenic properties. Rutin, an important flavonoid in asparagus, is one of the best natural antioxidants, but it has low bioavailability. It is, however, used in food including as a preservative and stabiliser. Other flavonoids in asparagus include tannin, anthocyanin, quercetin and kaempferol. According to At WHFoods[3], quercetin is one of the best-researched flavonoids in nutrition, and its intake has been linked to reduced risk of numerous cardiovascular diseases as well as other chronic health problems. A study in Japan found asparagus was the most important dietary source of quercetin (following onions) for people living near Hokkaido. Also found in asparagus are sulphur-containing compounds (S-compounds), one of which, Asparagusic acid, has been reported as being unique in asparagus and of strong interest for its pharmacological and flavour properties. (Some S-compounds have also been highlighted as being major contributors to the distinctive urine odour following asparagus consumption.)

Still much to learn about Asparagus

Asparagus also contains steroidal saponins, often associated with medicinal properties, including improving the health of rats on a high-cholesterol diet. These compounds are also linked to the characteristic bitter taste of asparagus. While this article spans benefits of eating asparagus spears, it's worth remembering that for centuries, other parts of the asparagus plant – such as roots and sprouts – have also been used in traditional medicine, particularly in Korea and China. There are even references to its use in ancient Greek and Roman times both for food and herbal medicines. And while A. officinalis is the commercial variety, various of the nearly 300 species in the genus Asparagus have been used for health reasons. Despite all this, there is still much to learn about the impact of asparagus on human physiology after ingestion and how best to store, cook and otherwise optimise its nutritional and flavour properties. *AW*

Sources:

1. *Pegiou, Eirini et al. "Green and White Asparagus (Asparagus officinalis): A Source of Developmental, Chemical and Urinary Intrigue." Metabolites vol. 10,117.25 Dec. 2019, doi:10.3390/metabo10010017*
2. *Wang et al. "The bioactive compounds and biological functions of Asparagus officinalis L. – A review" Journal of Functional Foods, Vol 65, 2020*
3. *WHFoods "What's New and Beneficial about Asparagus" http://www.whfoods.com/genpage.php?tname=foodspice&dbid=12*

NUTRIENTS IN 100G OF ASPARAGUS (COOKED, BOILED, DRAINED)

Name	Amount	Unit
Water	**92.6**	g
Energy	**22**	kcal
Protein	**2.4**	g
Total lipid (fat)	**0.2**	g
Carbohydrate, by difference	**4.1**	g
Fibre, total dietary	**2**	g
Sugars, total	**1.3**	g
Calcium, Ca	**23**	mg
Carotene, beta	**604**	µg
Cholesterol	**0**	mg
Choline, total	**26.1**	mg
Copper, Cu	**0.165**	mg
Fluoride, F	**21.9**	µg
Folate, total	**149**	µg
Iron, Fe	**0.91**	mg
Lutein + zeaxanthin	**771**	µg
Lycopene	**30**	µg
Magnesium, Mg	**14**	mg
Manganese, Mn	**0.154**	mg
Niacin	**1.08**	mg
Pantothenic acid	**0.22**	mg
Phosphorus, P	**54**	mg
Potassium, K	**224**	mg
Riboflavin	**0.139**	mg
Selenium, Se	**6.1**	µg
Sodium, Na	**14**	mg
Thiamin	**0.16**	mg
Tocopherol, gamma	**0.21**	mg
Vitamin A, IU	**1006**	IU
Vitamin B6	**0.079**	mg
Vitamin C, total ascorbic acid	**7.7**	mg
Vitamin E (alpha-tocopherol)	**1.5**	mg
Vitamin K (phylloquinone)	**50.6**	µg
Zinc, Zn	**0.6**	mg

Source: USDA FoodData Central

Source: Flickr

There is still much to learn about how best to store asparagus, cook it and otherwise optimise its nutritional and flavour properties.

Asparagus in party mood

Asparagus is more than just a vegetable. It heralds the arrival of spring, and many countries dedicate local festivals to the vegetable, offering opportunities not only to eat asparagus but also to elect Asparagus Queens or create illustrious fraternities in its honour.

Germans have an intensely passionate relationship with asparagus. The countless festivals taking place across the country attract large gatherings and see Asparagus Queens elected in many regions. This year, Saskia Kuenzer was elected Asparagus Queen of Hessen (bottom-right of this page).

© Gemeente Puurs-Sint-Amands

In Belgium, each year three grandmasters of asparagus award a celebrity the title of "Asparagus Knight of the Counts Society of the Klein-Brabant Asparagus". In 2020, the Belgian actor Riddering Jelle Cleymans (top left of this page) was awarded the honour of protecting the crops against winds and dragons.

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© La Voix du Nord

In France, asparagus is celebrated in the many towns and villages where it is grown. In 2019, Tatiana Beghin was elected Miss Asparagus Country.

© Fête des Asperges - Hoerdt

Hoerdt's asparagus festival takes an equal opportunity approach by electing both a Miss and a Mister Asparagus. In 2019, Ronja Fischer and Maxime Humbert became the new Miss and Mister Asparagus.

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At the National Asparagus Festival in Oceana County, Michigan, an asparagus queen is elected by members of the state's asparagus royalty.

© National Asparagus Festival of Oceana County, MI

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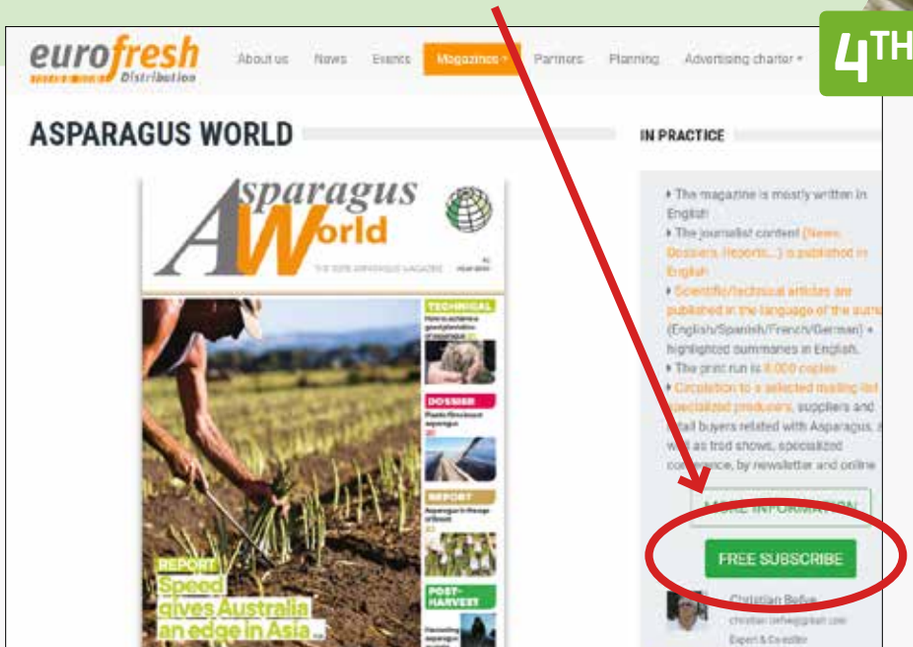

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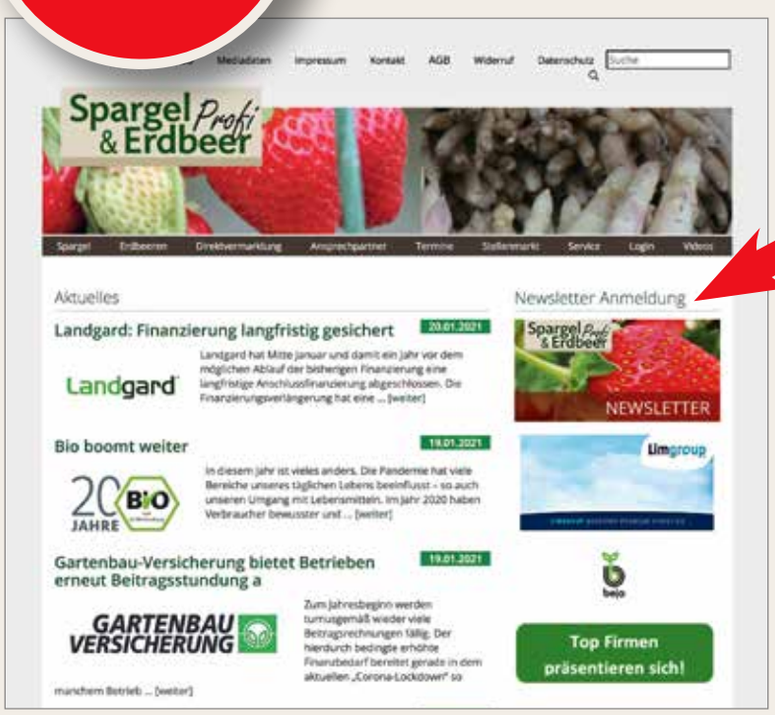

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