Haygrove

TOTAL VENT

PART OF THE
ADVANTAGE SERIES

FOR GROWERS, BY GROWERS

Born of the berry growing industry over 30 years ago, Haygrove now supply growing systems to the best growers of over 30 crops in more than 50 countries around the world.

As commercial growers ourselves, we understand the complex challenges presented by climate, geography, crop sensitivities, labour resourcing, market demands and the ongoing development of technology that will reshape our industry.

Our engineers work with our growers to innovate solutions that are functional, sustainable and profitable. Our polytunnels, substrate systems and associated technologies are developed and tested rigorously on our own farms to optimise the natural environment for maximum productivity and quality of crop.

As a business we are working strategically to create employment, provide healthy food sources for the world's growing population, and consistently improve environmental standards for the future of our planet.

With our expansive range of products and expertise, we work collaboratively with each of our customers to cultivate their potential, for the long term.

Haygrove

TOTAL VENT
THE ULTIMATE IN VENTING FLEXIBILITY

Our patent pending Total Vent polytunnels are uniquely designed to mechanically roll the polythene to the apex of the tunnel, creating precise climate control and mitigating the effects of extreme weather events.

SUPERIOR TUNNELS FOR OPTIMUM RETURN ON INVESTMENT

At Haygrove we develop commercial solutions for a huge range of customers, from small-scale growers to international horticultural specialists. Total Vent is part of our premium Advantage series, designed and used by us in our farms around the world.

Our versatile Advantage series has been specifically engineered with tomorrow in mind. Strength, ease of management and a superior agronomic environment allow growers to reduce labour requirements, extend cropping seasons, optimise yield and quality and adapt to changing conditions.

The advantage of the fully retractable Total Vent combats a range of challenges, including widely accepted downsides to protected cropping. The ability to fully open and fully close the tunnel gives growers the agility to manipulate the climate to maximum effect.

Yield and crop quality have the potential to excel with the improved tunnel management boosting plant health, pest and disease management, pollination and reduced plant stress in hot, dry or humid environments. Total Vent can be integrated with retractable shade nets and existing environmental farm management systems to give growers a suite of mechanisms to effectively manage the climate, at a signifcantly lower cost than alternative greenhouse products.

FOR THE LONG TERM

Being growers ourselves, we're always asking - how can we best anticpate the challenges of unpredictable climates, complex and demanding markets, and a rapidly evolving industry?

Total Vent's innovative strength and function safeguards both the valuable crop and the tunnel structure investment from increasingly frequent extreme weather events. Total Vent allows growers to adapt quickly to the ever-changing challenges of horticulture. Growers can be versatile today, and over the 25 year lifespan of the total vent investment.

WHAT'S THE ADVANTAGE?

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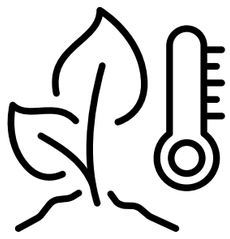
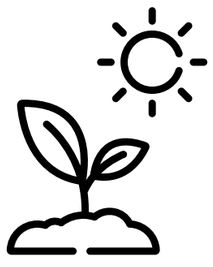


Climate Control

Total Vent allows for better temperature and humidity control by allowing you to open the roof or sides of the polytunnel in hot weather. The air vents on Total Vent are in the most effective position to allow hot air to rise and escape, preventing hot air accumulating above the crop.

Ventilation

Adequate ventilation is crucial for preventing the build-up of humidity and controlling temperature fluctuations. Total Vent enables improved air circulation, reducing the risk of diseases and promoting healthy plant growth.



Natural Light

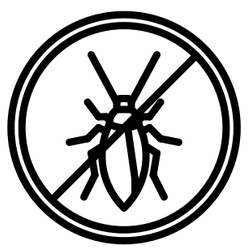
Fully retracting the polythene on the Total Vent will increase the UV light exposure, giving growers a potential increase in both plant health and rates of photosynthesis.

Energy Efficiency

By utilising natural ventilation and sunlight, Total Vent can reduce the need for artificial heating, cooling, and lighting. This can result in energy savings and lower operating costs.

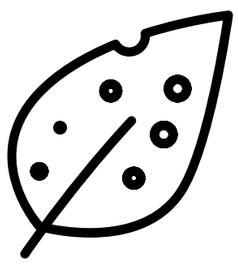
Adaptability

The retractable design allows you to adapt the greenhouse to different weather conditions and seasons. During colder months, the roof can be closed to retain warmth, while it can be opened during warmer months to prevent overheating.



Pest Control

Improved ventilation and the ability to expose plants to outdoor conditions can help reduce the risk of pest infestations. Natural predators can also be introduced to the greenhouse more easily.

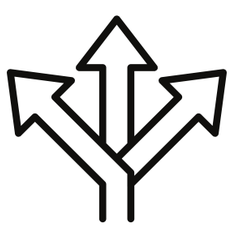


Reduced Disease Risk

Free water on crops increases disease pressure. Proper ventilation and sunlight exposure help prevent the buildup of moisture, and therefore prevent the spread of fungal and bacterial diseases.

Pollination

Rolling up the polythene allows beneficial pollinators better access through the crop improving pollination efficiency. Managing humidity and temperature are key to optimising pollination rates.



Customisation

Total Vent can be customised to fityour specific needs, sizes, and plant types. Total Vent is available in bay widths up to 10 metres wide with multiple configuration options to match your preferences.

Improved Plant Quality

The controlled environment offered by Total Vent can lead to healthier and more robust plants, ultimately improving the quality of your crops and their ability to perform better.

CLIMATE CONTROL

Protecting crops from pests and adverse weather, our Advantage series tunnels optimise climate conditions for your specific environment and needs. Minimising wastage and maximising your yield potential, our industry-leading growing systems also enable you to forecast with greater accuracy, and therefore build strong relationships with customers who can rely on your performance. Confidence in your ability to consistently supply quality products will lead you to access premium markets and the opportunity to increase your profit margin.

SURVIVING THE SPIKES

A fundamental difference between growing in Total Vent tunnels compared to a conventional polytunnel or glasshouse is the functionality to fully vent the tunnel. Fully opening and closing the tunnel gives growers the flexibility to manage the growing climate throughout the day and seasonally, including during the extremes.

Total Vent is particularly effective when the outdoor weather conditions are too hot and humidity levels are either too high or too low. Total Vent can be operated to mitigate plant stress by managing the internal VPD (vapour pressure deficit) through regular, strategic venting throughout temperature spikes.

TEMPERATURE, HUMIDITY AND VAPOUR PRESSURE DEFICIT (VPD) MANAGEMENT

VPD is the relationship between temperature and humidity. The measurement determines how much moisture the air can hold before it becomes saturated. It's a critical factor in plant growth and transpiration rates. The ability to fully open and fully close Total Vent provides the opportunity to maintain optimal VPD conditions and offers several advantages:

Prevention of Disease
Maintaining optimal VPD can help reduce the risk of fungal and bacterial diseases that thrive in conditions of high humidity. With the ability to adjust the growing climate, you can manage VPD to create an inhospitable environment for pathogens.

Enhanced Cooling and Temperature Control
Proper VPD management contributes to effective cooling of plant surfaces through transpiration. With Total Vent you can regulate the opening and closing of the roof or sides to maintain an optimal VPD, which aids in temperature control and prevents overheating

Reduced Stress and Improved Resilience
Plants experiencing stress due to high VPD levels or inadequate moisture uptake can exhibit reduced growth and susceptibility to environmental stresses. By controlling VPD, you promote healthier and more resilient plants that can better withstand fluctuations in temperature and humidity.

Optimal Photosynthesis
VPD affects the rate of photosynthesis as it influences the opening and closing of stomata (small pores on plant leaves). A balanced VPD helps ensure that stomata remain open for proper gas exchange and CO2 uptake, leading to improved photosynthesis and plant growth.

Moisture Management
Effective transpiration management helps regulate the moisture content in the internal environment. Proper ventilation, combined with irrigation practices, ensures that plants receive adequate water without leading to excess moisture buildup that could contribute to disease.

Water Efficiency
Plants in an environment with balanced VPD are more efficient in their water usage. This can lead to reduced water consumption and better resource management, especially in regions with limited water availability.

Tailored to Plant Requirements
Different plant species have varying VPD preferences based on their natural habitats. With Total Vent, it allows you to adjust VPD to match the specific needs of the plants you're cultivating, creating a customised and optimal growing environment.

Reduced Energy Costs
Correct VPD management can contribute to efficient temperature control and humidity levels, potentially reducing the need for energy-intensive heating and cooling systems.

Higher Quality Crops
Maintaining optimal VPD can lead to improved plant health, stronger root development, and higher quality crops, ultimately enhancing the market value of your produce.

CLIMATE CONTROL

Our Advantage tunnels have been specifically designed to maintain optimum climate conditions outside of traditional cropping seasons, increasing yield-potential in both volume and flexible planting. Investment costs are absorbed over a longer period, enabling you to price competitively within the market, and achieve greater return on investment.

Transpiration is a process by which water is absorbed by plant roots, transported through the plant, and then released into the atmosphere as water vapour through small openings on the leaves called stomata.

Transpiration is a crucial physiological process that influences plant growth, nutrient uptake, and overall health. Managing plant transpiration is important for maintaining optimal moisture levels and promoting healthy plant development.

Here's how Total Vent benefits plant transpiration:

Humidity Control
Plant transpiration contributes to humidity levels within the greenhouse. As plants release water vapor through their leaves, the humidity in the surrounding air increases. With Total Vent, you can control humidity by adjusting ventilation and allowing excess moisture to escape when needed.

Temperature Regulation
Transpiration also plays a role in temperature regulation. As water is released from the leaves, it cools the plant and its immediate surroundings through evaporative cooling. This cooling effect can help moderate temperatures within the greenhouse, especially during hot periods.

Moisture Management
Effective transpiration management helps regulate the moisture content in the greenhouse environment. Proper ventilation, combined with irrigation practices, ensures that plants receive adequate water without leading to excess moisture buildup that could contribute to disease.

Nutrient Uptake
Transpiration is closely linked to nutrient uptake. Water absorbed by the roots carries essential nutrients throughout the plant. A well-regulated greenhouse environment ensures that plants can effectively transpire and absorb nutrients, leading to healthy growth.

Carbon Dioxide Exchange
Stomata, the tiny openings on leaves, also play a role in gas exchange. During transpiration, carbon dioxide (CO2) is taken in by the plant for photosynthesis. Adequate ventilation and transpiration allow for a steady exchange of CO2 and oxygen, promoting photosynthesis and growth.

Preventing Water Stress
Monitoring and managing transpiration rates can help prevent water stress in plants. If transpiration exceeds the rate of water uptake, plants can experience wilting and other stress-related symptoms. Proper humidity control and irrigation practices in Total Vent help maintain a balance.

Disease Prevention
Excessive moisture can create a favourable environment for fungal and bacterial diseases. By managing transpiration and humidity levels, you can reduce the risk of disease outbreaks and create a healthier greenhouse environment.

Growth and Development
Transpiration influences the overall growth and development of plants. Adequate transpiration rates contribute to turgidity (cellular rigidity), nutrient transport, and hormone distribution, all of which are essential for optimal plant health.

Total Vent allows you to control plant transpiration by adjusting ventilation, humidity, and irrigation practices. Monitoring environmental conditions and plant health regularly will help you make informed decisions to ensure that transpiration rates remain within a healthy range for your specific plant species and growth goals.

NATURAL LIGHT

Total Vent has the ability to fully open and expose plants to natural sunlight when the weather is favourable, whilst still protecting the crop. This can enhance photosynthesis and overall plant health. When used in conjunction with Haygrove polythene and a retractable shade net, growers have a number of options to influence the light and climate variables to influence the crop.

Daily Light Integral (DLI) is a measurement of the total amount of photosynthetically active light received by plants over a 24-hour period. DLI is a critical factor in plant growth and development, as it directly influences photosynthesis, flowering, and overall plant health.

Total Vent allows growers to maintain an optimal DLI which offers several advantages:

Enhanced Growth and Yield
Proper light management can maximize DLI by adjusting the roof or sides to allow more sunlight to reach plants. This increased light exposure can lead to accelerated growth rates, improved crop yield, and faster flowering in many plant species.

Energy Efficiency
By utilising natural ventilation and sunlight, Total Vent can reduce the need for artificial heating, cooling, and lighting. This can result in energy savings and lower operating costs.

Improved Photosynthesis
Photosynthesis is directly related to the amount of light plants receive. By controlling the DLI through retractable mechanisms, you can optimise photosynthesis rates and increase the production of sugars and other vital compounds for plant growth.

Tailored Light Conditions
Different plants have varying light requirements. Total Vent allows you to tailor the light conditions to the specific needs of different plant species. For example, shade-loving plants can be placed in areas with reduced light exposure while sun-loving plants can be positioned to receive more direct sunlight.

Improved Photosynthesis
Photosynthesis is directly related to the amount of light plants receive. By controlling the DLI through retractable mechanisms, you can optimise photosynthesis rates and increase the production of sugars and other vital compounds for plant growth.

Better Resource Management
With precise control over light levels, you can optimise resource allocation, including water and nutrient uptake. Plants that receive optimal light are more efficient in utilising these resources, leading to healthier and more productive plants.

Crop Scheduling
Certain crops require specific DLI ranges to trigger flowering or fruiting. With Total Vent, you can manipulate the DLI to match the desired schedule for different crops, facilitating staggered planting and harvesting.

POLLINATION

Total Vent offers several advantages when it comes to pollination, which is a critical process for the reproduction of many plant species.

Here's how Total Vent can provide benefits for pollination:

Pollinator Access
Total Vent allow you to control the movement of pollinators such as bees and other insects. By opening the vents during periods of pollinator activity, you can facilitate their access to the plants and promote effective cross-pollination. Some polythenes have properties that disorientate pollinators, by removing the polythene the pollinators can be more efficient.

Customised Environment
Total Vent can be managed to create an environment that caters to the specific needs of both plants and pollinators. By adjusting temperature, humidity, and other factors, you can optimise conditions to encourage pollinator activity and successful pollination. Managing humidity and temperature are key to optimising pollination rates. If humidity is too high the pollinators are ineffective, but when humidity is too low the pollen does not stick.

Protection from External Factors
Total Vent can provide a barrier against harsh weather conditions, strong winds, and pests that might interfere with natural pollination. This protection ensures a stable and suitable environment for both plants and pollinators.

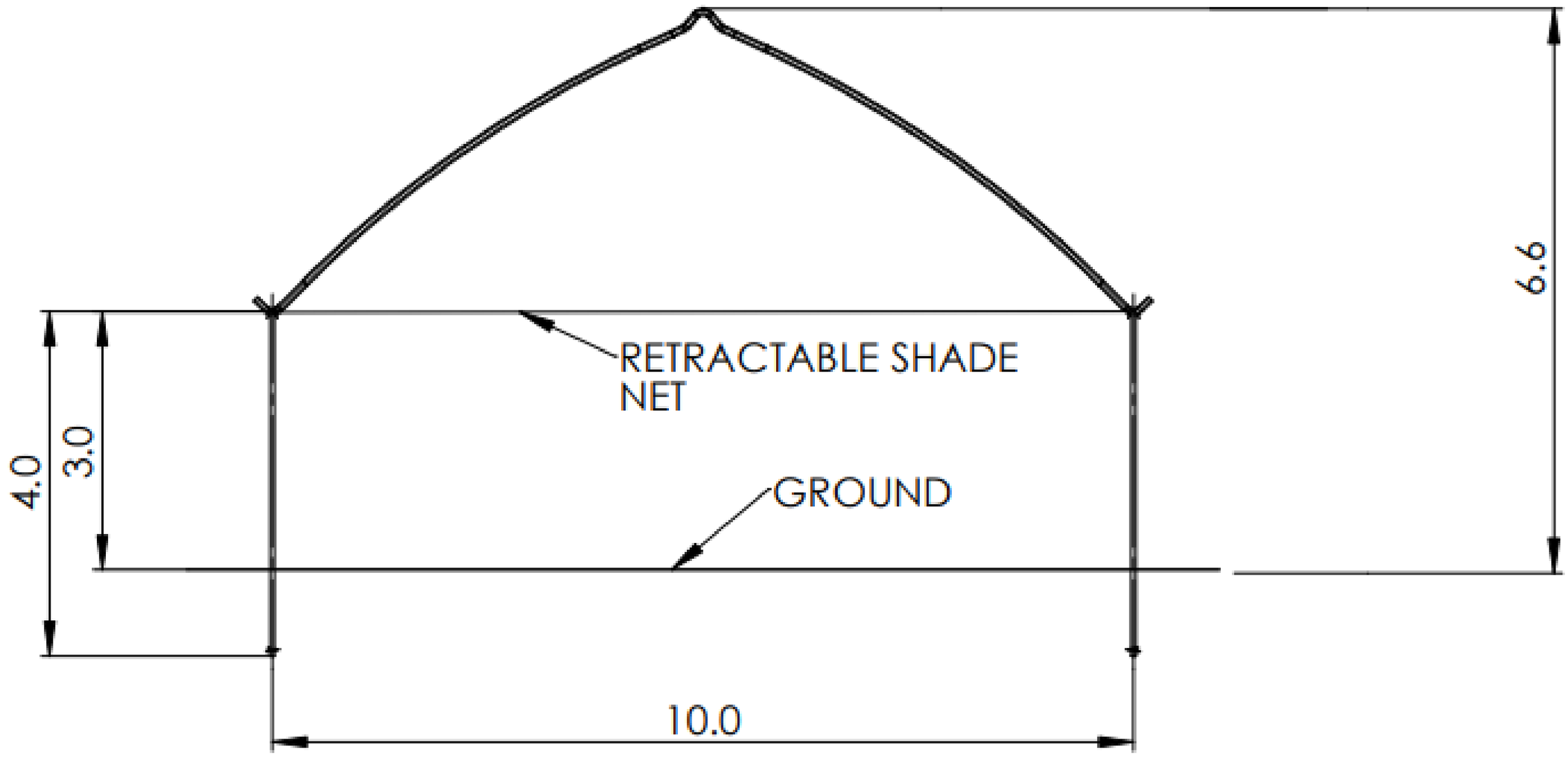
Extended Growing Seasons
With Total Vent, you can extend the growing season by controlling temperature and creating a favourable environment for both plants and pollinators, even during colder months. This extended availability of pollinators can lead to increased pollination and fruit set.

Pollination of Sensitive Plants
Some plants are sensitive to environmental changes and require consistent conditions for successful pollination. Total Vent allows you to maintain these conditions, enhancing the likelihood of successful pollination.

Customised Environment
You have the flexibility to create an environment that caters to the specific needs of both plants and pollinators. By adjusting temperature, humidity, and other factors, you can optimise conditions to encourage pollinator activity and successful pollination.

Enhanced Crop Yield and Quality
Effective pollination leads to increased fruit set, larger yields, and improved fruit quality. By ensuring a controlled and suitable pollination environment, Total Vent can contribute to better overall crop productivity.

It's important to note that while Total Vent offers advantages for pollination, some plants may still benefit from manual pollination or alternative pollination methods depending on their specific characteristics. Additionally, creating a pollinator-friendly environment within the greenhouse, such as providing suitable nectar and resting places, can further enhance pollinator activity and effectiveness.



A STRONG AND SMART DESIGN

Innovations in our Advantage range reduce set-up and running costs, including for skinning, venting, climate control and picking. Intelligent, cost-effective automation allows you to invest in smaller teams – mitigating the rising cost and scarcity of quality labour. Combining versatile infrastructure with a reduced payroll to optimise tunnel management, you can maximise profit while preparing for a robotics-centric future.

Total Vent is available in bay widths up to 10 metres wide. This is comparable to those of a glasshouse, rather than traditional polytunnels. Haygrove can confidently offer wider bay widths due to the use of strong HSO steel. HSO steel is our High Strength Oval Steel and its proven itself to be the smart choice for growers worldwide.

Increasing tunnel bay width has agronomic, operational and economic advantages. The wider bay widths allow a higher planting density as less area is used for the tunnel structure. The increased number of plants increases the intensity of production by increasing yield, resulting in quicker payback.

The wider the tunnel, the less fruit exposed to weather at the leg row. Even if protected from the wind and the rain, the leg rows are generally cooler than the centre rows, less leg rows create a more consistent growing climate in the tunnel and therefore more consistent fruit timing.

HSO 80

With the addition of mechanical venting, it is practical to increase the leg to 3m to the gutter height, as manually venting from the ground is no longer necessary. The higher leg increases air volume within the tunnel which buffers temperature changes, creating a more stable internal climate.

With a 3m gutter height, a retractable shade net can be installed without restricting access. The retractable shade net is another tool used to manage the growing environment and improve the yield and quality.

RAINWATER GUTTERS

With water availability becoming an increasing concern, it is a valuable asset to be able to collect and store water for crop irrigation.

The benefits of mechanised venting go beyond improving yield, quality, and season extension. The combination of Total Vent fitted with Haygrove's rainwater gutters optimises rainwater collection. The harvested rainwater can be collected and stored for irrigation, mitigating the risk of crop failure due to drought.

Total Vent allows for the the vents to be closed quickly when rain is forecasted which both protects the crop and increases the water catchment area to include the entire covered area. When rainwater gutters are fitted to manually vented tunnels, its often not practical or possible to the close the vents when it starts raining which jeopardises the quality of the leg row fruit and significantly reduces the potential of the rainwater harvesting as the catchment area is smaller.

Haygrove's rainwater gutters are manufactured from pre-galvanised steel, which as an additional benefit add considerable strength to the tunnel structure.

RETRACTABLE SHADE NET

A Retractable Shade Net option offers an additional climate management tool maximise the potential of the crop. The shade net can be deployed strategically throughout the day to balance UV light exposure and VPD management for optimal growing conditions.

The mechanised system operates over an area of up to one hectare at a time pulling shade nets on and off again. The system can be used with a wide spectrum of netting types and even thermal screens to suit the growing requirements.

ROLLER DOORS AND SIDES

Roller doors (at the ends of the tunnels) and sides can be strategically operated to regulate temperature, humidity and airflow. These can be either operated manually or mechanised depending on the preference of the grower.

The ability to open the ends and sides also provides access for people and machinery. When closed, the roller doors and sides provide a good seal to offer internal wind protection and extend the growing season.

We understand that every geography, and every crop, requires specialist knowledge to cultivate the best possible growing environment at the lowest cost.

To discuss which systems could facilitate your growth, get in touch with us at:

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