

HEATMAT
UNDERFLOOR HEATING

Southeast England and Bordeaux Region



Vineyard
heating cables



Southeast
England



Bordeaux
France



Frost damage on unprotected vines, Southeast England



Vines protected with Heat Mat cables, Southeast England

The Goal

Spring frosts can be devastating to vineyards and temperatures falling to -2°C can wipe out as much as 50% of a vineyard's yield.

With the increase in vineyards being planted at more northerly latitudes, and global warming leading to bud-burst earlier in the season, vineyards are experiencing a greater threat from frost than ever before.

The frost damage occurs when the water inside the plant cells freezes and ruptures the delicate tissue inside. Vines are most susceptible to this at the point of bud-burst and in the short period afterwards.

Historically, active frost protection in vineyards was carried out with fire bougies, however these have environmental impacts and require manpower on site in the early hours of the morning. More recently fans and hot air blower systems have become available and alternatives such as foam or water sprinkler systems also have their place.

All systems have their benefits and their drawbacks, and none provide a complete solution for all vineyards.

Heat Mat's Solution

Heat Mat worked with their parent company, Heatcom, to design a custom vineyard heating cable from the ground up. Using their more than two decades of experience with outdoor heating cables they designed a robust and UV-stable heating cable that could cope with the challenges of a vineyard throughout the season.

Following extensive testing under controlled conditions the correct balance between convective and radiant heat from the cables was identified and designed into the cable. Maximising convective heating rather than radiant heating resulted in more air movement which helped to reduce frost. Radiant heat was shown to play only a minor role

on surfaces more than 45mm away from the heating cables, and was non-existent for buds and shoots when outside of the line of sight of the cable.

The cable was upgraded to include fluoropolymer and XLPE internal insulation layers and the outer insulation was strengthened against UV radiation, enabling it to qualify for an industry leading 20 year warranty.

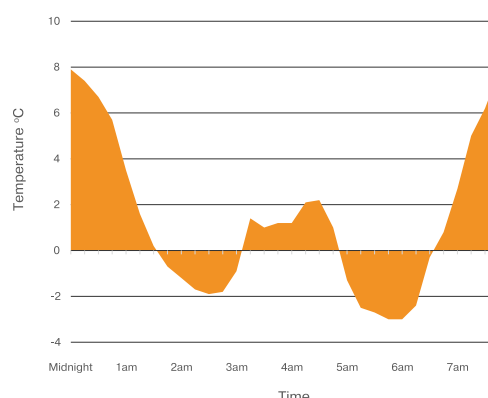
The fully automated control gear for the system comes in a simple panel with plug and play connections for the heating cables and air temperature sensor. The system can be powered from the mains or via a generator and at 230V or 410V.

The Result

Test systems were installed at four vineyards ready for spring 2025. However a low number of frost events at most sites, while great for the vineyards, was not so useful for the cable's testing requirements.

One site however did experience a severe frost on the 6th May, well after bud-burst and when four leaves had separated. After daytime temperatures of up to 16°C the overnight dry bulb temperatures dropped to -3°C . The vines experienced more than three hours of sub-zero temperatures, and around one and a half hours between -2.4°C and -3.0°C .

Within the area hit by frost three rows of
Frost event temperature data



Project in detail

Date Installed

2025

Location

Southeast England and Bordeaux Region, France

Client

Test systems were installed at three vineyards in the Southeast of England and at one in Bordeaux, France.

System Specifications

- Bespoke length vineyard heating cables 230V or 410V systems as desired
- Plug and play control gear
- Plug and play heating cables


vines were protected by Heatcom's innovative vine heating cables with three unprotected rows next to them, acting as a control.

The results in the protected area though were very different.

Where the heating cables were providing protection vines lost an average of only 0.66 buds/shoots per vine, an 83% reduction in the damage caused by frost. All data was independently collected and was taken prior to shoot thinning.

The vines in the control rows suffered significant frost damage with an average loss of 3.89 buds/shoots per vine leading to many frosted shoots

KEY RESULTS



83%

reduction in frost damage

Protected vines lost only 0.66 buds/shoots vs 3.89 in control rows

The Heatcom System

Heatcom's unique and fully automated vineyard heating system provides numerous advantages to the vineyard manager and should be considered as part of any site's comprehensive radiation frost protection regimen. Benefits include:

- Silent operation - no disturbance to wildlife or neighbours
- Zero light pollution - no disruptive glowing fields at night
- Zero water usage - ideal in water-restricted environments
- No costly chemical sprays - saving money and the environment
- Systems can stay in place year round - even during pruning
- Fully automated and no on-site manpower required
- Very low running costs per hour
- Industry leading 20 year warranty on cables
- 3 year peace of mind warranty on enclosures and control gear



Test system, Bordeaux

The heating cable, or the conduit it can be installed in, should be held onto the fruiting wire using plant ties. The cable/conduit should be as close as possible to the fruiting cane and ideally touching it to allow the conduction of heat through the sap in the cane. Additionally there will be a radiant heat benefit to the shoots nearby, and more importantly a convective plume will be created leading to warmer air moving past the shoots above the heating cable. The convective current is the main prevention method for frost and the cable does not need to have 'line-of-sight' to the vine above it to protect it, a major benefit over purely radiant heating cables.

During testing at one site energising the cables whenever temperatures dropped to 2 °C overnight led to the vines advancing their growth by roughly a week compared to unprotected vines. This advancement has both benefits and drawbacks but can be used to increase the growing season if desired. If vine advancement is not desirable then the systems can be turned on only at 0 °C or lower.

The system is designed for installation by the vineyards on-site team and only requires a qualified electrician to make any connections directly into the mains supply. Unlike some alternative heating cables, Heatcom's system has a fixed heat output per linear meter and a stable power requirement, vastly simplifying the electrical connection of the system. Heatcom can provide the desired cable



Frost damaged shoot on unprotected vine



Gas Heaters, Southeast England

connectors to allow connection of the panel directly to a generator if desired and produce bespoke panels for every installation.

Unlike most alternative cable heaters, once the system is installed it is designed to be left in place throughout the year without needing to be taken in after each spring offering a huge saving on manpower. The cable is usually attached to the fruiting wire therefore should be safe from all pruning and thinning operations. If, however, the cable is damaged it is straightforward to repair using one of Heatcom's cable repair kits.



Test system, Southeast England

While no single frost protection solution is perfect for all areas of every vineyard, Heatcom's unique solution is perfect for small to medium sized vineyards and for the frost pockets and hard to protect areas in larger vineyards.

To protect a hectare of vines the capital investment for the Heatcom system is roughly the same cost as running fire bougies for four nights in a row over the same area, and that is before taking into account the staffing costs for lighting the bougies.

The only running costs for the Heatcom cable system are the electricity it uses, and when protecting vines over a hectare the running costs are in the region of only £35 per hour, which compares favourably to gas heater systems.

The payback period for the capital cost of a system is hard to predict, however the investment in the Heat Mat system could be recouped in as little as two seasons on the average UK vineyard if it protected 70% of the shoots that would have otherwise been lost to frost.

For more information on how Heat Mat and Heatcom can help you protect your vineyard please contact us.



Fire Bougies, Southeast England

About Heat Mat

Heat Mat have more than two decades of experience designing and supplying unrivalled frost protection and ice and snow melting systems. From station platforms and the roof of the NEC through to pipe protection and numerous horticultural uses Heat Mat have the expertise to solve your frost protection issues.

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