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energy and climate change

REPORT

Heat stress and UK food imports from the Mediterranean

September, 2026

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Summary

- 2026 has seen extraordinary climate change-driven heat. The UK experienced its hottest summer, Europe its hottest June (Copernicus), and the western Mediterranean hit new record high sea surface temperatures in July, as the Mediterranean is warming at double the rate of global oceans, increasing humidity and overnight temperatures.
- By August, the UK and Europe endured five heatwaves in a row as rainfall below seasonal averages has led to widespread and severe drought and wildfires, including some so intense that they generated their own storms.
- This is all *before* a particularly strong El Niño has reached full strength and added additional heat across the climate system; its arrival is likely to mean 2027 reaches record levels of temperature rise above pre-industrial times.
- In 2024, around 1.5 billion people worldwide – a quarter (25.3%) of the working-age population – worked outdoors. Research has shown 640 billion potential work hours were lost because of heat exposure that year. That was higher than 2023 – the previous high – and 98.1% higher than the annual average in the decade from 1990-1999.
- Agricultural workers are by far the group most exposed, globally, to heat stress, accounting for nearly two-thirds (63.5%) of all potential work hours lost – or three quarters (75.5%) in low Human Development Index countries.
- The Mediterranean region has seen heat stress amongst agricultural workers increase markedly in recent decades. In 2025, the 22 Mediterranean nations included in our analysis lost an estimated 2.8 billion potential working hours to heat stress.
- That equates to almost 137 hours per worker, across a workforce of 20.5 million people. In 1990, the equivalent figure was just over 66 hours per worker, meaning heat-related work losses have more than doubled over the last 35 years.
- The UK imports two fifths of the food it consumes from overseas. In 2025, the Mediterranean countries accounted for around £18.1 billion worth of those imports – about a quarter of UK food imports (26.8% by value; 25.1% by volume), and therefore around one tenth (10%) of total UK food supply.
- In 2025, we paid 13% more for the UK's food imports from the Mediterranean than three years earlier, in 2022, whilst the volume (by kg) of those imports rose by only 1%. The price per kg rose 12%, with the sharpest rise in that period (20%) being from 2022 to 2023, after particularly extreme heat across large parts of Europe.

Context

Average global temperatures have risen by around 1.4°C since pre-industrial times (Copernicus) – i.e. since humans began burning coal, oil and gas, as well as encroaching onto and eroding nature. The resulting climate crisis is driving ever more dangerous and expensive extremes in all parts of the world as our changing climate drives volatility in weather, ocean, and atmospheric currents, and threaten critical natural biomes. On top of long-term temperature rises driven by climate change, a powerful El Niño in 2026-27 will add more heat, potentially making 2027 the hottest year ever recorded.

As the planet heats and climate change impacts worsen, we are seeing the effects on harvests at home and abroad, with knock-on effects on food supplies and therefore prices. We import two fifths of the food we consume – much of it commodities we cannot easily grow in the UK climate. But even the foods we grow at home – sometimes supplemented by imports from southern Europe (ECIU) – are being hit.

After recent wet winters, and with extended extreme heat and widespread drought, UK farmers are facing the prospect of the worst harvest on record (ECIU) this year, leading to hundreds of millions of pounds' worth of losses from lost and damaged crops. Last year saw the second worst harvest on record in this country (ECIU). And the result of impacts in the UK and overseas is that just five food items hit hardest by extreme weather (ECIU) are disproportionately driving overall food inflation, accounting for up to 40% of food inflation (ECIU) on their own.

Heat stress around the world

2025 was the third hottest year on record (Copernicus), joining 2023 (second hottest) and 2024 (hottest). 2026 looks likely to rank up amongst them, if not beat them. The UK experienced its hottest summer, and Europe its hottest June on record (Copernicus), as wildfires in Spain and France were so intense that some generated pyro-cumulonimbus clouds – creating their own storm (BBC). In July 2026, the western Mediterranean recorded a new record high sea-surface temperature (Copernicus), and it is warming at roughly double the rate of global oceans (European Geosciences Union, citing Copernicus) which increases humidity and overnight temperatures in the region around it.

On top of this, a particularly strong El Niño effect – which the UK Met Office have warned could be the strongest since the 19th century – will amplify climate change impacts. One of the growing threats from these rising temperatures is heat stress. Research is highlighting the role of not just temperature, but also of humidity.

A recent study (Environmental Research, 2026) looked at how the threat posed by our hotter climate is putting limitations on day-to-day activities for people – particularly older people, and particularly those in poorer parts of the world without ready access to air-conditioning. With more than a third of the world's population living in regions where heat severely affects daily life, the researchers found that the number of days on which extreme heat limits people's ability to engage in routine tasks, like walking or undertaking light-to-moderate housework, has doubled over the past 75 years. The study concludes that "if warming is not stopped and adaptation measures are not more widely implemented, liveability constraints will only expand, particularly as the global population ages."

That is even starker in relation to how rising heat affects human health in the workplace, where activity tends to be more intense and sustained than in our day to day lives outside of work. The World Health Organisation describes workplace heat stress as the:

> *"Circumstances under which a worker's body accumulates heat due to the combined effects of metabolic heat, environmental factors and clothing worn. Workplace heat stress causes physiological heat strain in the body that can lead to exhaustion, pathological conditions and death."*

The International Labour Organisation calculated, in 2019, that, by 2030, heat stress would cut working hours globally by 2.2%, costing $2.4 trillion in GDP – a rise from $280 billion in 1995. More recently, in 2024, the ILO estimated that 71% of the global workforce is exposed to excessive heat, with that proportion rising to 74.7% in Asia, 83.6% in the Arab states, and 92.9% in Africa.

Studies presented in the 2025 report of the Lancet Countdown on health and climate change have looked at the growing impacts from heat stress, around the world, including on workers and productivity. Those working outdoors are worst affected, unable to take advantage of building cooling methods, and often with limited shade in increasingly extreme levels of heat.

Freyberg et al (Ruby Coast Research Centre) looked at the working hours lost to heat stress over time in countries around the world. In 2024, around 1.5 billion people worldwide – a quarter (25.3%) of the working-age population – worked outdoors.

The team's research used wet bulb globe temperature (Duke University) and metabolic rates to develop an indicator – working hours lost – of the growing impact of heat stress on those people working outdoors. High humid heat days are those where wet-bulb temperature (PNAS) exceeds 90% of normal levels.

As the atmosphere warms, so the amount of moisture it can hold increases. In 2024, when average global temperatures rose to around 1.5˚C higher than pre-industrial times, humidity reached record levels (Met Office). Not only did the total amount of water above the planet's surface – total column water vapour – reach a level where almost 90% of the atmosphere was wetter than the 1991-2020 average, but the global average number of high humid heat days over land hit a record high of 35.6 days more than normal in 2024; 9.5 more than in 2023.

A wet-bulb temperature, taken by wrapping a wet cloth around a thermometer's bulb and exposing it to the air, measures the temperature when the air is cooled by evaporation. It therefore indicates how easily sweat can evaporate, and so the ability of a person to cool down. The lower the humidity – so, the drier the air – the more water/sweat can evaporate.

High humidity limits evaporation, therefore limiting a human's ability to cool by sweating. Wet-bulb temperatures above 30˚C become increasingly dangerous to humans, until they risk becoming lethal at around 35˚C.

Wet-bulb temperatures translate into different ambient temperatures (the temperatures more regularly reported), depending on the relative humidity. The start of the danger zone (30˚C wet-bulb temperature) can be encountered at different ambient temperatures in different locations - for example, it corresponds to somewhere above 40˚C at moderate relative humidity, and around 50˚C at lower relative humidity. Climate change means that air is generally warmer, and that in turn means that it can also contain more moisture, and this combination means that higher wet-bulb temperatures are being reached.

Wet-bulb *globe* temperature is a version of the wet-bulb temperature, specifically designed to estimate heat stress on people. It synthesises three measures: a wet-bulb temperature; black globe temperature (measuring radiant heat from the sun); and a dry-bulb temperature (measuring just normal air temperature). In doing so, it accounts for humidity, the sun, air temperature, and wind. It is therefore a more sophisticated and holistic measure of heat stress in the workplace – whether indoors or outdoors – as it enables an estimation of the level of danger of performing physical activity in these circumstances.

The relationship between wet-bulb globe temperature and Freyberg *et al*'s indicator – work hours lost – is not linear. In general, for a particular rate of work it is more like a sigmoid curve (or s-curve) where the steepest rate of change comes at about the mean core temperature of the human body – 36.5˚C, +/- 4˚C. Humidity therefore has an important role to play in heat stress and there will normally be a significant difference in mean working hours lost between two countries that have similar mean annual temperatures, but very different mean annual humidity.

The working hours lost indicator is built using climate measures, population distribution, and estimates of the proportion of people employed in particular sectors. Climate data is averaged over grid cells of 0.5˚ latitude by 0.5˚ longitude, meaning that heat exposure is assessed at a medium scale rather than at individual worksites.

The world's climate is highly complex, with conditions varying sharply across regions and shaping the environments in which people live and work. A widely used framework for capturing this variation is the Köppen–Geiger climate classification, which groups the globe into major climate zones according to long-term temperature and precipitation patterns, including tropical, arid, temperate, cold, and polar climates. These zones create distinct risks for human labour. Tropical regions, for example, are more likely to expose workers to high temperatures and high humidity, increasing the risk of heat stress and reducing work capacity.

Freyberg et al's research, published in Lancet Countdown, showed a loss of 640 billion potential work hours as a result of heat exposure in 2024. That was higher than 2023 – the previous high – and 98.1% higher than the decade from 1990-1999. The biggest impact per worker was in countries that score low to medium on the Human Development Index (HDI), which respectively lost 250 and 358 potential work hours per worker. This is in sharp contrast to high HDI countries (120 potential work hours per worker), and very high HDI countries, which lost only 45 potential work hours per worker.

Agricultural workers are by far the group most exposed to heat stress. Globally, according to Freyberg et al, they account for nearly two-thirds (63.5%) of all potential work hours lost. This rises to exactly two thirds in medium HDI countries, and three quarters (75.5%) in low HDI countries. This compares to construction workers, who account for 17.7%, service workers (10%), and manufacturing workers (8.8%).

Work hours lost (WHL) is expressed in hours but is derived from estimates of the proportion of working time during which heat stress exceeds recommended occupational health thresholds, applied to a standardised reference working schedule. It is intended primarily to indicate relative exposure and changes over time, rather than to measure *actual* hours lost in *specific* countries, sectors, or workplaces. In line with ILO and WHO methodologies, WHL is calculated assuming a 12-hour working day, seven days per week, centred on solar noon, when heat stress is typically highest. In many regions, temperature and wet bulb globe temperatures peak several hours after solar midday, and most estimated losses occur during this period. However, in locations with limited daily variation in temperatures or where prevailing work patterns involve shorter working days and fewer working days per week, this approach may overstate WHL as an absolute value and should therefore be interpreted with caution.

Heat stress – a growing risk to UK food security

The UK Climate Change Committee's Fourth Independent Assessment of UK Climate Risk said, in May 2026, that "risks to food production (domestic and international) are one of the key vulnerabilities of the UK's food supply to climate impacts". We already know that that relates to worsening climate change impacts on the food crops themselves, delaying planting and damaging harvests, leading to less and poorer quality food products. But, given how reliant agriculture is on people working outdoors, the Climate Change Committee's assessment goes on to say that, "increasingly, climate-driven heat stress in key growing regions can impact the availability and productivity of labour."

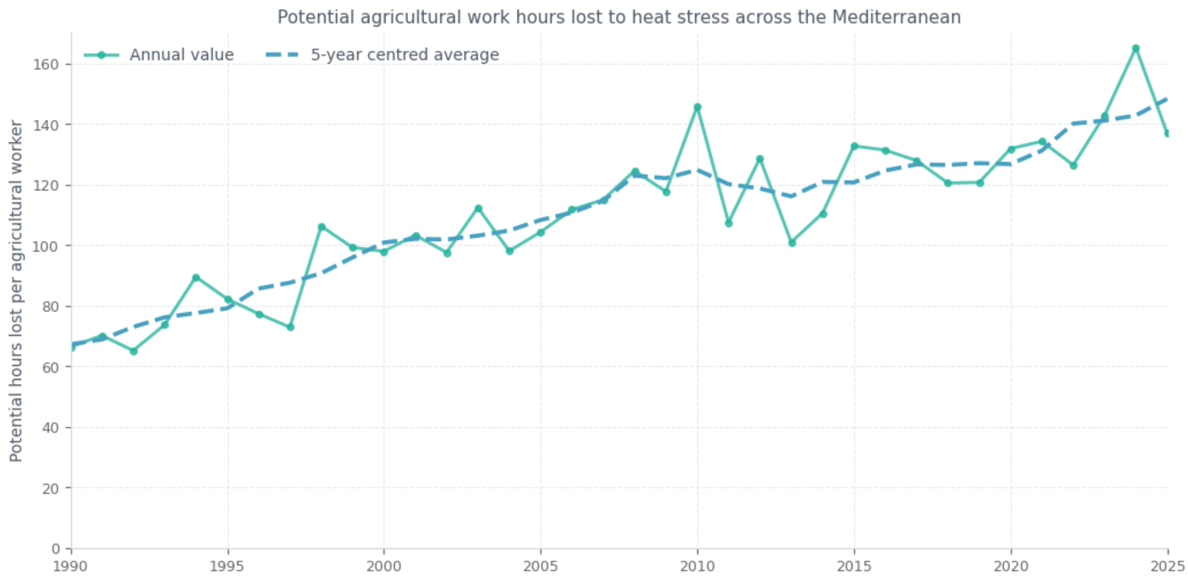
To understand the risk that heat stress poses to UK food supplies we have previously looked at the nations which supply most food to the UK (ECIU), and which are amongst those nations most vulnerable to climate change, and least resilient to its impacts.

Here, using 2025 data for heat stress (Ruby Coast Research Centre), we look at 22 nations around the Mediterranean. For the purposes of this analysis, Mediterranean nations comprise: Albania, Algeria, Bosnia and Herzegovina, Croatia, Cyprus, Egypt, France, Greece, Israel, Italy, Lebanon, Libya, Malta, Montenegro, Morocco, Palestine, Portugal, Slovenia, Spain, Syria, Tunisia, and Türkiye. This draws on the United Nations Environment Program Mediterranean Action Plan (UNEP/MAP) definition. However, we have added in Palestine, because it borders the Mediterranean and because we import food from there, but excluded Monaco, for which there was no food import data. We have also included Portugal which is often grouped in definitions of the region as it shares many biogeographical similarities with Mediterranean countries.

The Mediterranean is one of the world's most climate-vulnerable regions and, increasingly, one where agricultural workers are being exposed to rising levels of dangerous heat. It is also a critically important source of food for the UK. In 2025, the 22 Mediterranean countries included in this analysis supplied around £18.1 billion worth of food imports, accounting for a quarter of UK food imports (26.8% of the UK's food import value and 25.1% of import volumes by weight).

Looking across the region, heat stress among agricultural workers has increased markedly over recent decades. In 2025, agricultural workers across these Mediterranean countries lost an estimated 2.8 billion potential working hours to heat stress. Across a workforce of around 20.5 million agricultural workers, that equates to almost 137 hours lost per worker. In 1990, the equivalent figure was just over 66 hours per worker, meaning heat-related work losses have more than doubled over the past 35 years. The long-term trend is clear and statistically significant, with hours lost per worker rising by around two hours per year on average since 1990.

Across the Mediterranean, number of hours lost to heat stress has more than doubled since 1990



Note: Mediterranean figure is weighted by agricultural employment: total potential hours lost ÷ total agricultural employment.

This rise in heat stress is increasingly affecting some of the UK's most important food-supplying countries. France, Spain and Italy alone account for around 81% of the value of UK food imports from the Mediterranean region, supplying nearly £14.5 billion of food in 2025. Since 2015, agricultural workers have seen heat-related work losses rise by around

46% in France, 30% in Spain, and while Italy's 2025 level is similar to 2015, losses have risen by more than 40% since 2020 and the trend is clearly pointing up. Similar upward trends are evident in other major suppliers, including Türkiye (+46% since 2015) and Morocco (+17%), which together account for a further 9% of Mediterranean food imports to the UK in 2025.

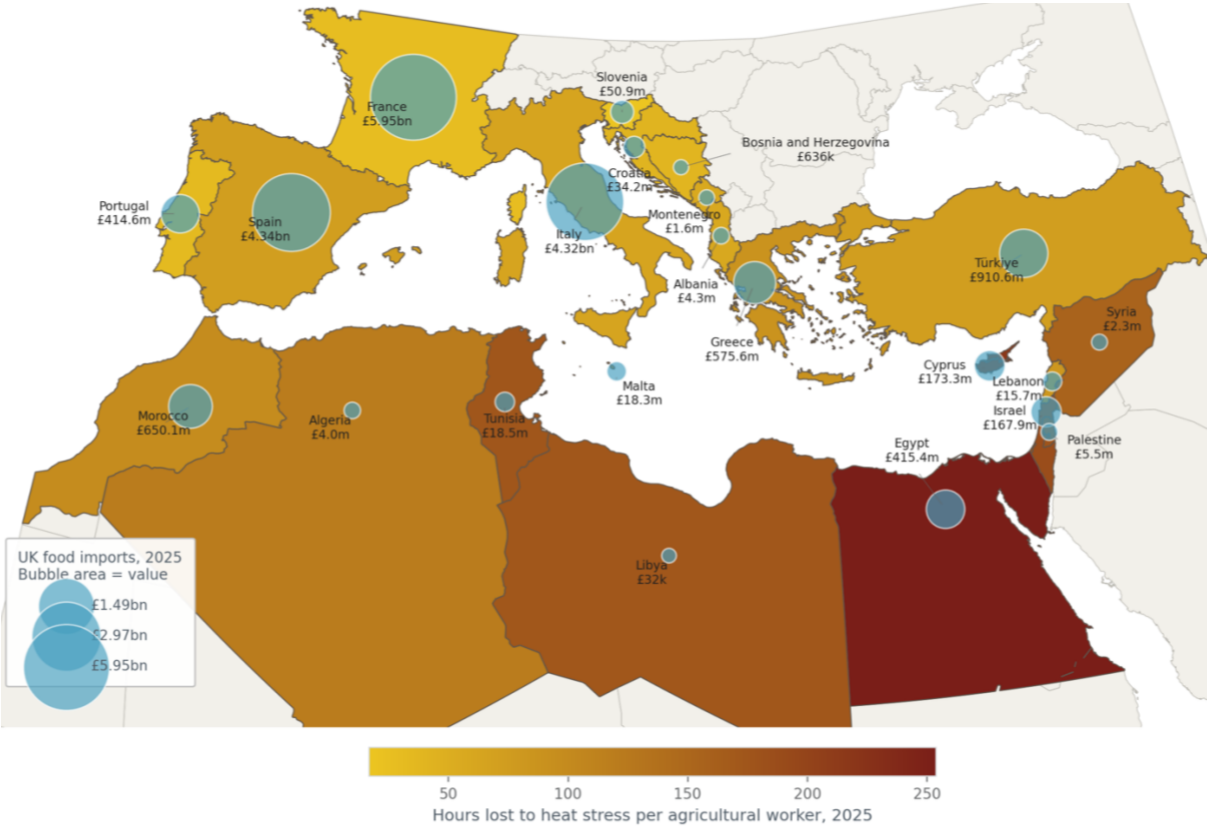
While annual losses fluctuate considerably from year to year depending on weather conditions, the underlying trend is clearly upward. Across the Mediterranean region, the five-year centred trend in annual hours lost per agricultural worker rose from around 121 hours in 2015 to 148 hours in 2025, an increase of almost a quarter in a decade. The trend has climbed steadily since the early 2010s, despite considerable year-to-year volatility. This suggests that rising heat exposure is not simply the result of occasional extreme summers but reflects a broader deterioration in outdoor working conditions.

Recent years have seen some exceptionally high levels of heat stress. The regional average reached a record annual level of 165 hours lost per worker in 2024 before falling back to 137 hours in 2025. However, even after this decline, the underlying trend continued to rise, reaching its highest level on record in 2025. This illustrates how individual years can fluctuate around a steadily increasing baseline as climate change raises the overall risk of dangerous heat exposure

In some countries, the absolute levels of heat stress are already extremely high. Agricultural workers in Egypt lost an estimated 254 potential working hours, per worker, to heat stress in 2025, while the equivalent in Cyprus, Israel, Palestine, Tunisia and Libya was around 170-220 hours. Even in major European food supplying countries where absolute levels are lower, the trend remains upwards. Spanish agricultural workers each lost an estimated 73 hours in 2025, compared with 56 hours a decade earlier, while Greece rose from 67 to 89 hours over the same period. As temperatures continue to rise, these losses represent a growing constraint on the ability of workers to safely carry out already hard and physically demanding outdoor jobs.

Heat stress and UK food imports across the Mediterranean

Country colour shows potential hours lost per agricultural worker in 2025; bubble area shows 2025 food imports

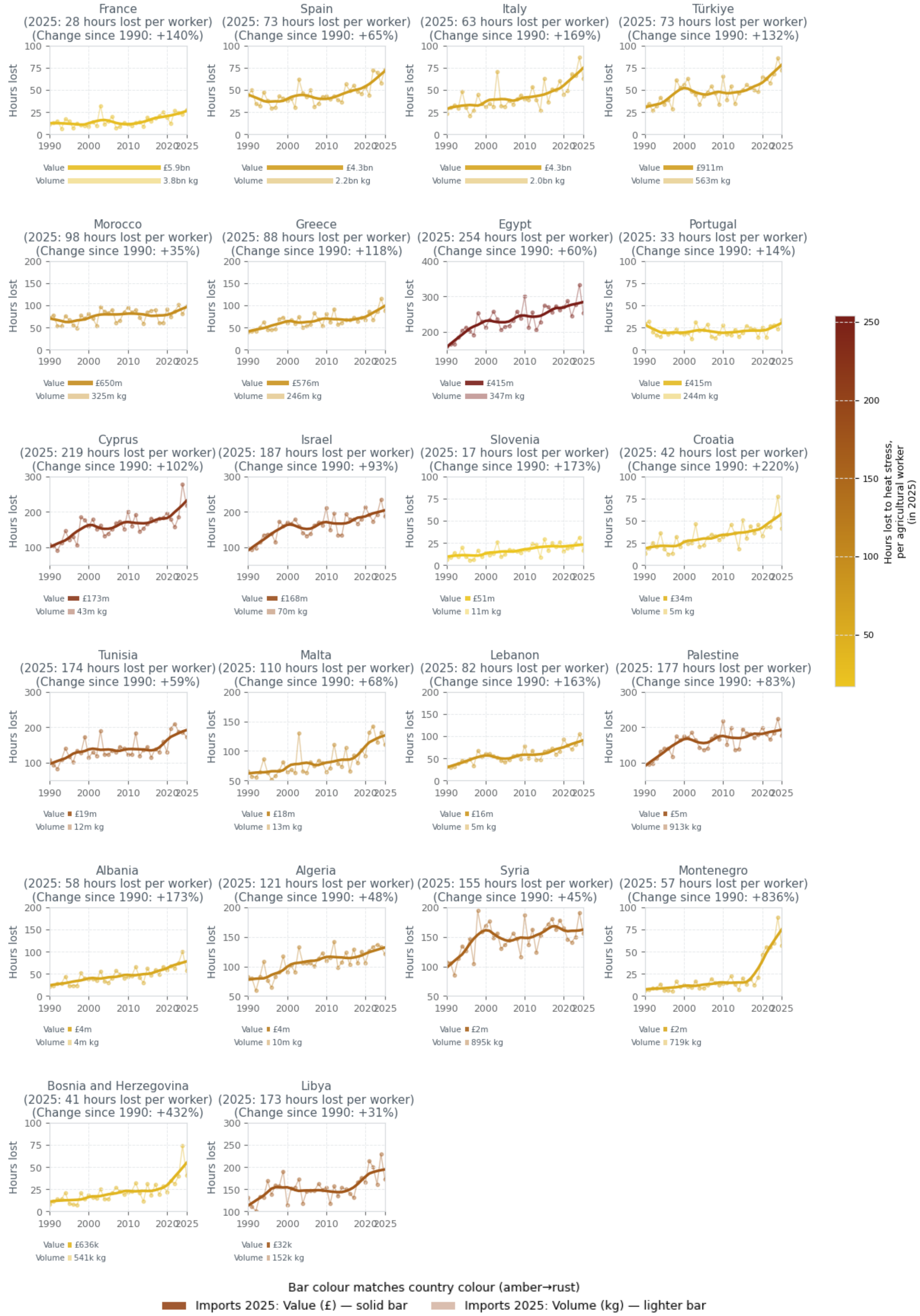


Heat stress – particularly in the most severely affected parts of the region – is a challenge not only for food production, but also for occupational health, worker wellbeing and livelihoods, limiting the number of hours that can be worked safely outdoors and increasing risks to workers' health. These pressures sit alongside the wider impacts of climate change on farming communities. Polling has found that a majority of UK farmers report experiencing anxiety and depression linked to climate-related pressures (ECIU, 2025) such as drought and flooding.

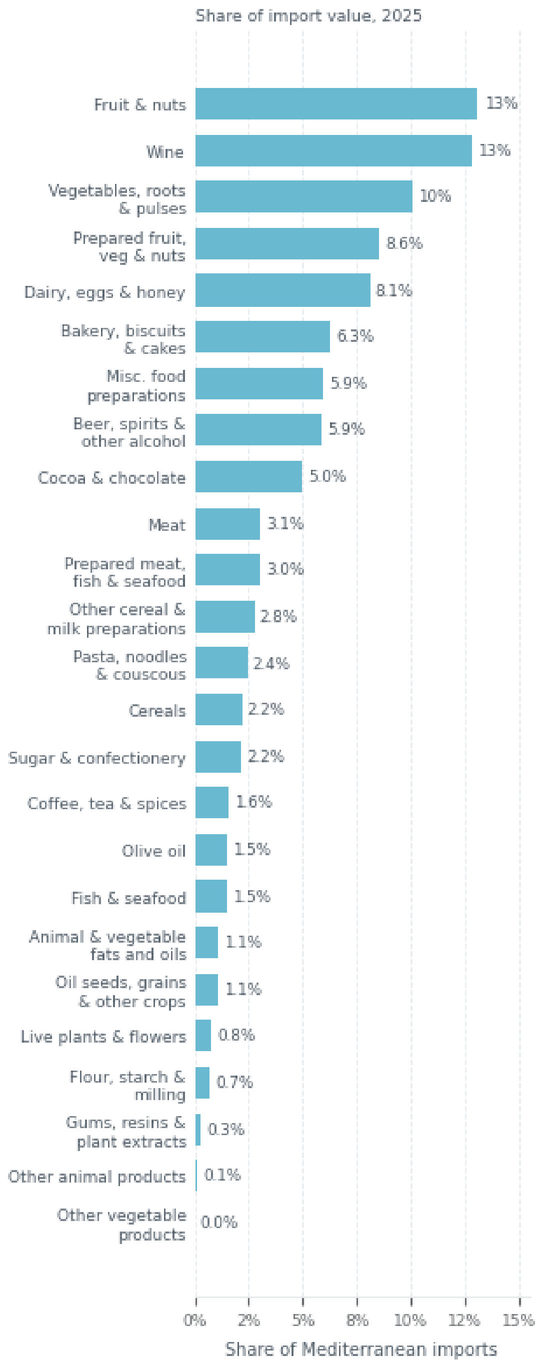
This points to a growing risk for food-importing countries such as the UK. Climate change is already damaging crops through heatwaves, droughts and water shortages; increasingly, it is also affecting the people responsible for growing and harvesting them. Together, these findings suggest that climate change is becoming a threat not only to harvests and yields, but also to the health, wellbeing and resilience of the people on whom food production depends.

Heat stress and UK food imports across the Mediterranean

Lines indicate potential hours lost to heat stress among per agricultural worker; bars show 2025 food imports



Top food imports from the Mediterranean



Categories use the commodity-code hierarchy; wine and olive oil retain the report classifications.

Source: ECIU analysis of UK trade data

Fresh fruit and vegetables make up 13% and 10% of UK food imports from the region, respectively. They are amongst the most climate-sensitive of foods, with highly perishable crops exposed to extreme weather and pests in a way that storable staples and many animal products are not (Discover Environment, 2026). Fresh produce is also heavily reliant on agricultural workers able to work outdoors in increasingly extreme conditions.

Wines also make up a significant part of what we buy from the Mediterranean region, comprising around 13% of imports by value. Like fruit and vegetable production, this also relies on outdoors work in terms of planting, tending, and harvesting grapes, before production moves indoors.

These, and products that are largely grown and processed within the region (such as olive oil – 1% of all UK food imports from the region) form the focus of our analysis.

Beyond this, a lot of food imported comprises prepared and processed foods. From the Mediterranean, for instance, some of the top imports (by value) include pizzas, pastas, quiches, tarts, doughs and breads. These are made from ingredients from many locations and are less straightforward to assess in terms either of impacts from worsening climate change impacts on the crops, or on the impacts on the workers engaged in their production, given much of the work will take place indoors, where heat stress is potentially more manageable.

As food production is hit by climate impacts, leading to shortages and rising prices, we can see areas where we are paying more, to import less. That is the case with certain individual commodities (see olive oil, for example) but is also true across the board.

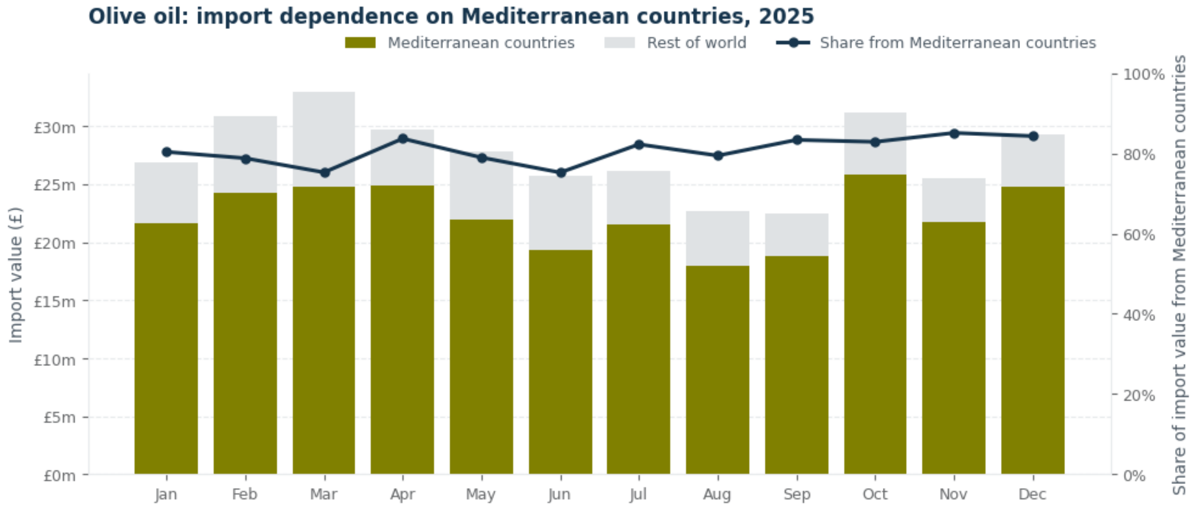
Overall, in 2025, we paid 13% more for all of our food imports from the Mediterranean region than we did in 2022, whilst the volume of those imports rose by only 1%. Over that time, therefore, the price we paid per kg of food imports from the region has risen 12%, with the sharpest rise being from 2022 to 2023 – which saw the price per kg rise 20%. This reflects their sensitivity to climate impacts such as droughts, floods, and heatwaves, as well as volatile oil and gas prices (ECIU, 2023).

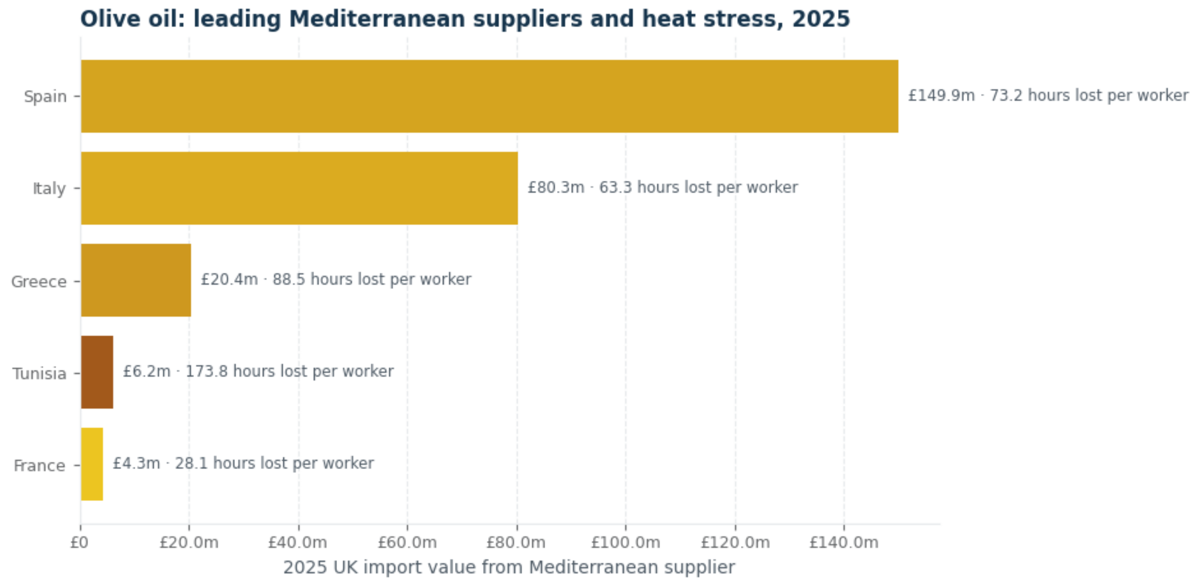
Increasingly, as temperatures rise, climate change impacts worsen, and heat stress becomes more dangerous, shortages and price increases stem not only from climate change threats to the crops themselves, but also from the impact on the people responsible for growing, harvesting, processing and transporting the food.

Olive oil

Though some small-scale production of olive oil has begun in England (The Times, 2026), we're still almost entirely import-dependent when it comes to olive oil. Much of the world's olive oil comes from the Mediterranean region. Spain is the world's dominant supplier, regularly producing around 40% of global output (International Olive Council, 2026). Italy (~10%), Türkiye (~10%), Tunisia (~8%), Greece (~8%), Portugal (~5%) and Morocco (~3%) are all significant producers. We import 80% of our olive oil directly from the region, but it's likely that the share that originates there is even higher as most of our imports from the rest of the world come from Germany and Belgium, who do not produce it themselves but act as distribution hubs. Over 50% of our Mediterranean olive oil imports come directly from Spain.

With the caveat that import origin isn't the same as production source, the weighted average potential hours lost per worker to heat stress among UK's Mediterranean suppliers was 74 hours in 2025. The weighted average potential hours lost per worker is weighted by the value of imports into the UK from these countries.



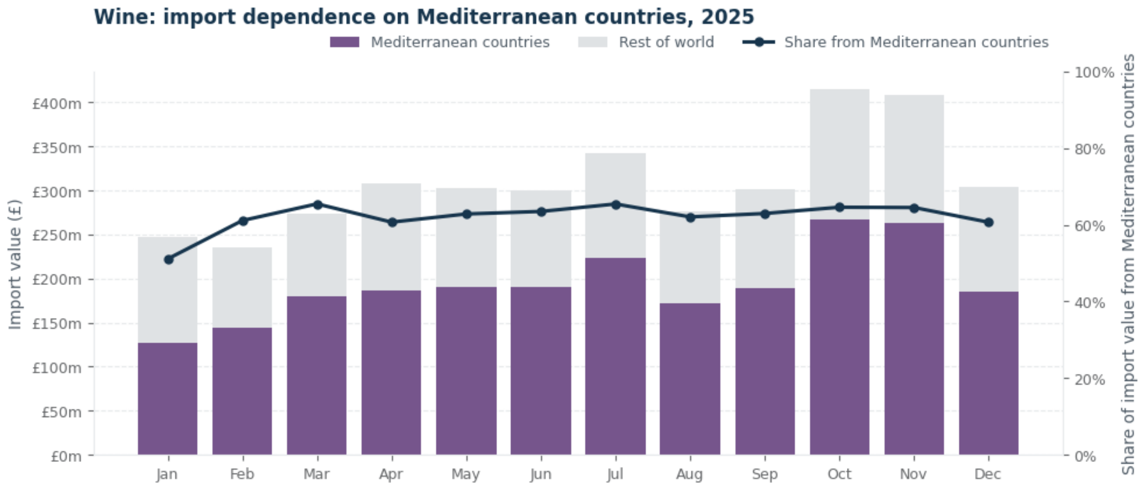


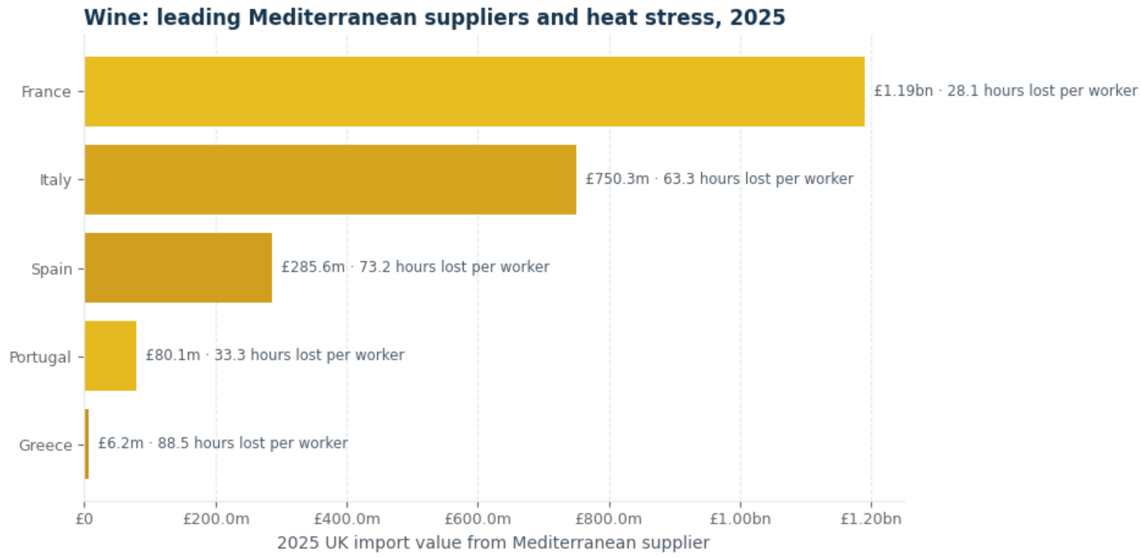
In 2022 and 2023, Southern Europe and other parts of the Mediterranean region – including olive oil-producing Spain, Italy and Greece – were hit by extreme heat, severe drought, and erratic rainfall. World Weather Attribution scientists set out the role climate change played in these (WWA). Olive crop yields fell sharply as a result, and Spain's olive oil production fell by more than half in 2022/23, as production in the EU fell by a 39% (Olive Oil Council).

As the largest producer in the global olive oil market, the severe hit in Spain pushed global prices up, with retail prices going up sharply – more than doubling (+145%) (ONS) between Jan 2021 and November 2024, creating a situation where olive oil became a major target for shoplifters in some countries (Guardian). In the UK, olive oil stood out at the top of the list of foods driving inflation, with the sharpest price rise of any other item on the list.

This hit was reflected in our imports. Prices have fallen back through 2025, but looking at 2024, compared to 2022, what we paid for all our olive oil imports rose 35%, whilst the volume we imported fell by around a quarter. In 2022, we were paying £3.89 per kg of olive oil, and by 2024, that had risen 83% to £7.10. Our olive oil from hardest hit Spain and Italy rose in price per kg by 90% and 101% respectively from 2022 to 2024.

Wine



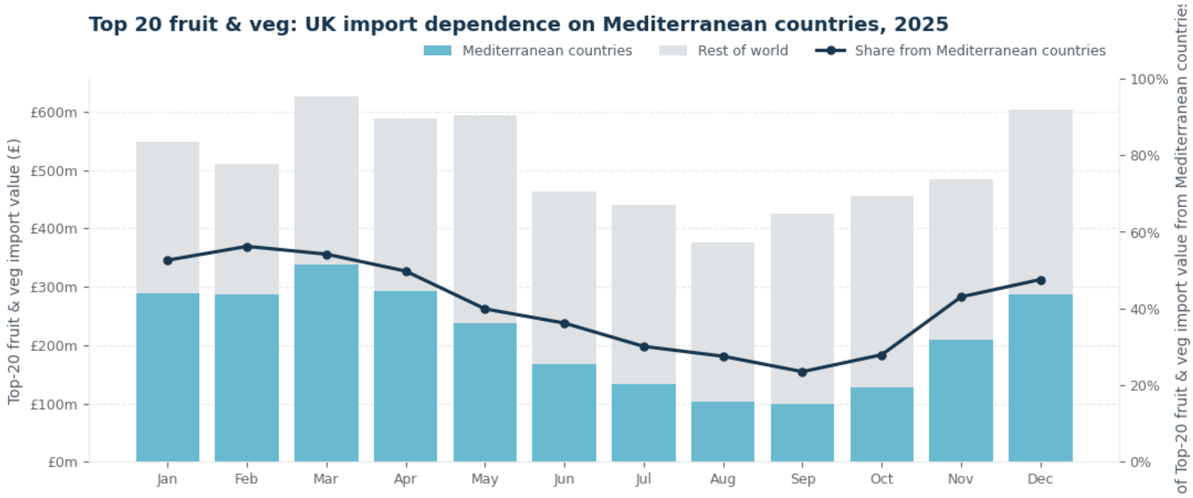


While UK wine production is expanding rapidly, it remains far from replacing imports. English and Welsh wine production rose by 55% in 2025 compared with the previous year (FSA via The Grocer, 2026), but domestic output was still equivalent to only around 1% of the volume of wine imported into the UK (ECIU analysis of Defra and FSA data, 2025).

The UK remains heavily reliant on Mediterranean producers, which supply more than 60% of imported wine, with France alone accounting for over half of that total. In 2025, these Mediterranean suppliers experienced an import-weighted average of a potential 46 hours lost to heat stress, underlining the vulnerability of UK wine supplies to climate impacts overseas.

Top 20 fruit and veg

The UK imports around 40% of the food we consume, including 86% of its fruit and 44% of its vegetables (Defra, 2025). Our analysis indicates that 42% of the top 20 most purchased fruit and vegetables[1], came from Mediterranean countries in 2025 and our import-dependence peaked in February and March. There's considerable seasonal variation depending on the seasonality of production of these products in the UK, the Mediterranean, and the rest of the world.



Spain dominates Mediterranean supply among these products, accounting for around half of the import value, followed by Morocco and France. Together, the three largest suppliers account for just over 80% of Mediterranean imports to the UK.

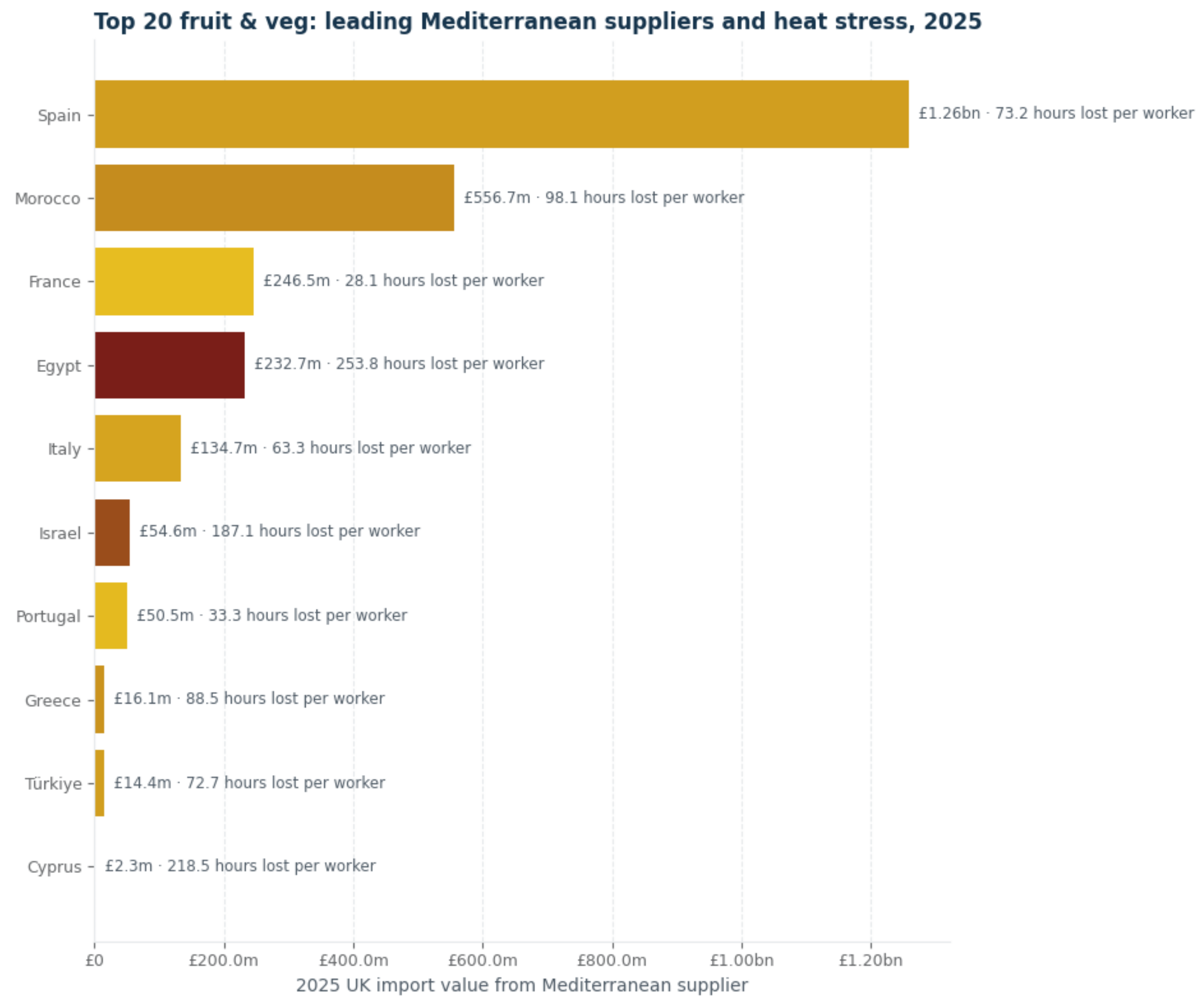
Exposure to heat stress also varies considerably between suppliers: estimated potential hours lost per agricultural worker range from 28 in France to 254 in Egypt, with Morocco at 98 hours and Spain at 73. Across all Mediterranean countries that supply these fruit and vegetables, an estimated 92 potential hours are lost per worker each year to heat stress on average.

This exposure should not be interpreted uniformly across crops or production systems. For example, in southern Spain, particularly around Almería, a significant share of vegetables such as tomatoes, peppers and cucumbers is grown under plastic. Although protected cultivation can reduce the exposure of crops to some external conditions, it does not necessarily reduce heat exposure for agricultural workers. Studies of Almería-type plastic greenhouses have found substantial occupational heat-stress risks, with poorly ventilated structures capable of becoming considerably hotter than outdoor conditions (Callejon-Ferre et al, 2011). National heat-stress estimates presented here should therefore be interpreted as measures of ambient climatic exposure and may not capture additional heat experienced by workers inside protected horticultural systems such as this.

[1] The most purchased fruit and veg is classified according to Fresh Produce Journal's Big 50 Products, 2023. This list identifies and ranks the 50 best-selling fresh fruit and vegetable products over the previous year in UK supermarkets. Full list in Appendix 1.

Protected cultivation is only part of the picture across the UK's main Mediterranean suppliers. Spain combines extensive protected horticulture with large areas of open-field vegetables, including lettuce, broccoli, onions, garlic, melons and watermelons. Morocco also has an important greenhouse sector, particularly for export tomatoes, but open-field production remains significant across crops including tomatoes, potatoes, courgettes, onions, melons and watermelons. Egypt similarly produces a wide range of vegetables and fruit in field and orchard systems, including potatoes, onions, garlic, melons, watermelons, citrus and grapes.

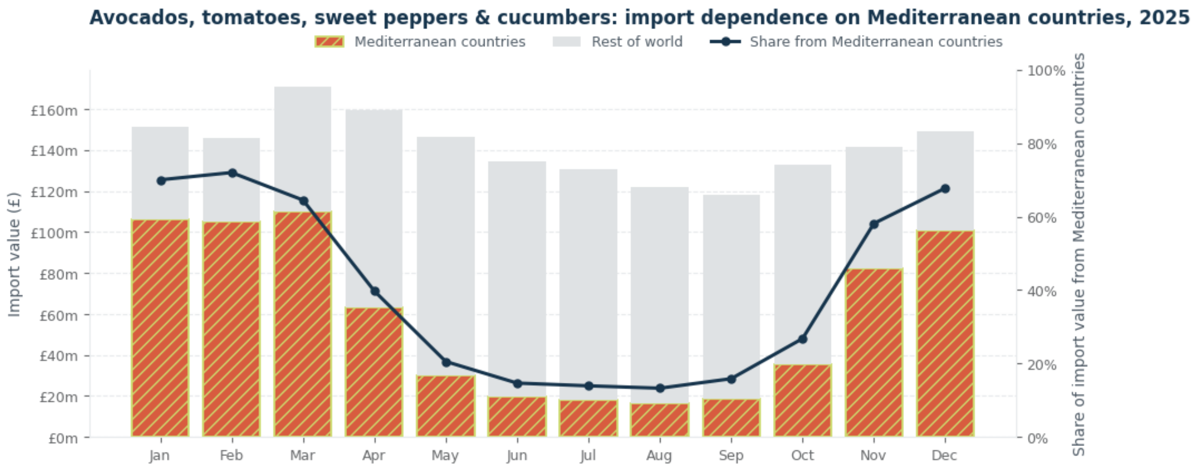
The extent to which crops are physically protected from extreme conditions therefore varies considerably between countries, regions and products. Open-field crops and orchards are more directly exposed to high temperatures, drought and water shortages, while crops grown under plastic may be partly shielded from some external conditions but remain sensitive to heat and irrigation constraints. The heat exposure figures should consequently be interpreted as regional measures rather than aggregated assessments of individual worksites.

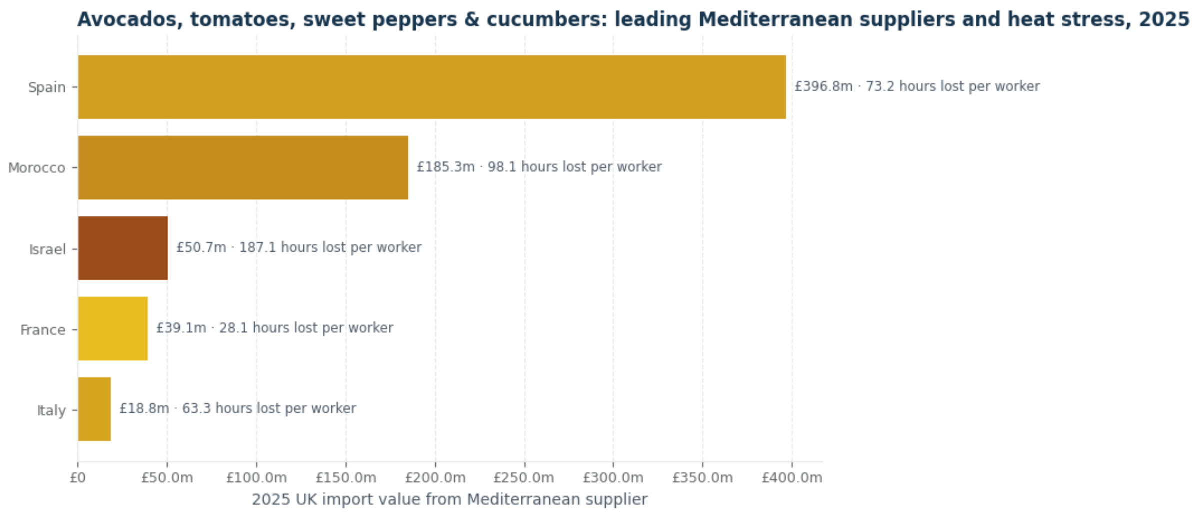


Avocados, tomatoes, sweet peppers, cucumbers

The UK is very import-dependent for many everyday salad vegetables. We produce just 22% of the cucumbers we consume, 16% of tomatoes, 7% of peppers, and none of our avocados. More than 60% of imports of these foods come from the Mediterranean during the winter months and 42% over the year as a whole.

Spain, Morocco and Israel are our largest Mediterranean suppliers. These countries are also among the most exposed to extreme heat, meaning the average worker in supply chains for these foods lost an average of 85 potential working hours in 2025 because of the heat.



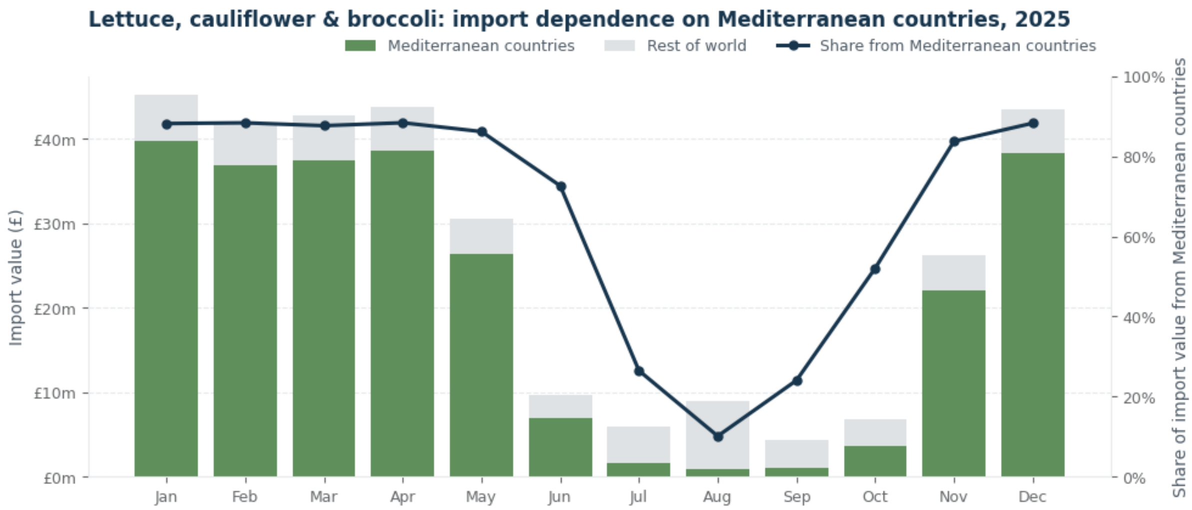


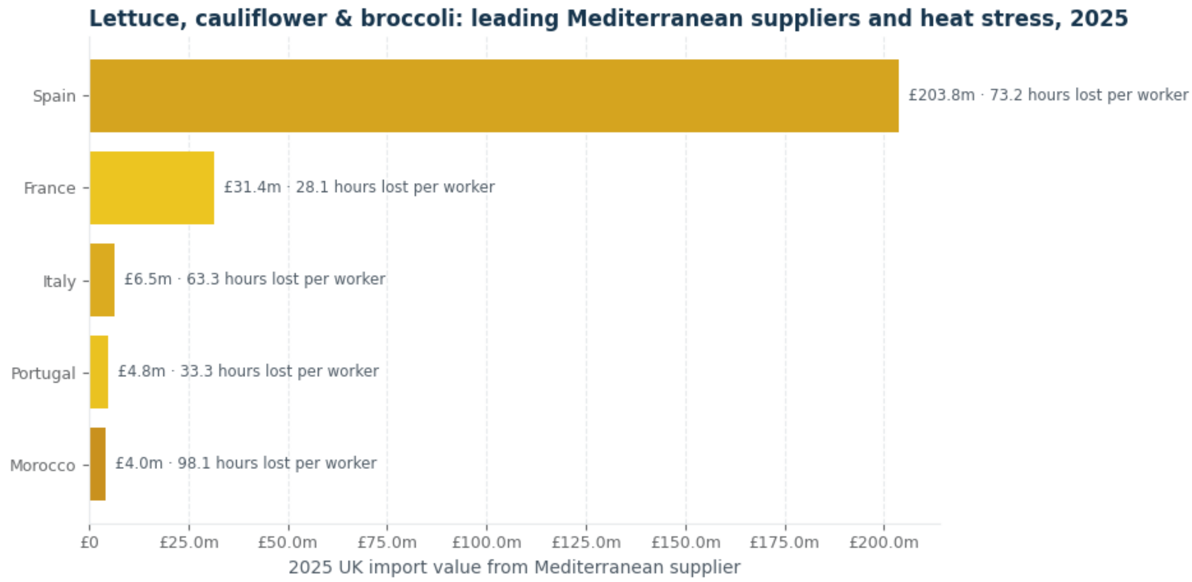
As climate impacts intensify in some of the regions we rely on most, the UK's exposure to supply disruptions and higher food prices grows. Avocados are a good illustration of the challenge, where we are paying more for less. From 2022-2024, the volume of avocados we imported from the Mediterranean rose 29%, whilst the total amount we paid for them rose 55%. The price per kg rose by a fifth, from £2.15, to £2.59. This included a much sharper rise in price for avocados imported from Spain – the second biggest source of avocados imported to the UK from the region – where the price per kg rose by 30%. And from Morocco, the price rose 26%.

Lettuce, cauliflower and broccoli

Even for certain vegetables that grow well in the UK, domestic production meets only a minority of demand. The UK is just 47% self-sufficient in lettuce and 35% in cauliflower and broccoli (Defra, 2026). Much of what we import for these vegetables comes from the Mediterranean, with over four fifths of imports coming from the region. Spain is the dominant Mediterranean supplier, producing 81% of these imported vegetables. Across the UK's key Mediterranean suppliers, workers lost an average of 69 potential working hours to heat stress in 2025, highlighting the growing climate risks embedded within our food supply chains.

Our import-dependence is highly seasonal, with high levels from December to April and lower import-dependence in June to October. However, this year's drought and heatwaves have impacted yields for homegrown lettuce and brassicas, resulting in reports of increased import-dependence within the UK's key production window.





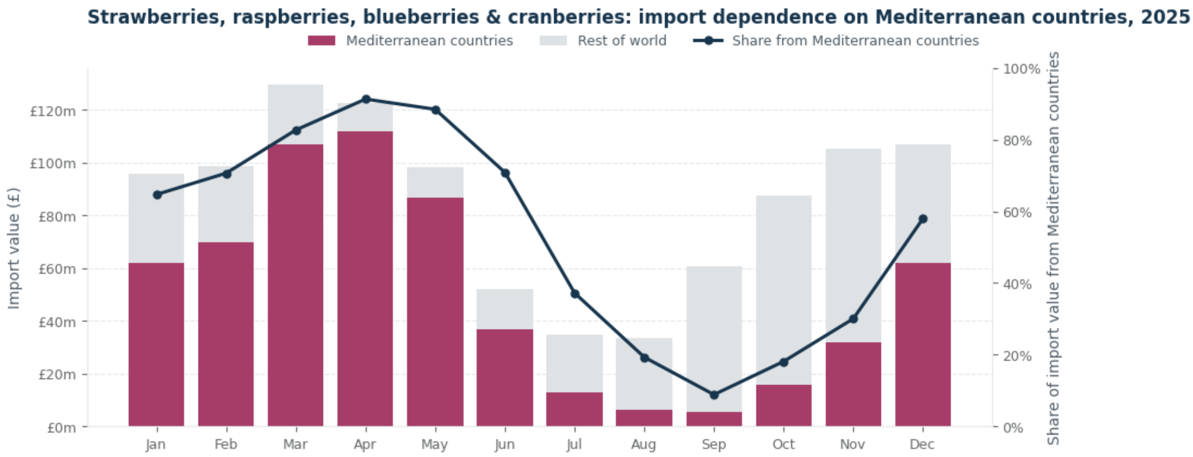
The experience of broccoli and cauliflower since 2022 illustrates how climate shocks can translate into higher costs. The cost of the UK's imported cauliflower and broccoli rose sharply after the hot summer of 2022, with 2023's imports valued 30% higher, whilst the volume we imported rose only 12%. UK production of these brassicas was hit in 2022 (DEFRA) after a dry spring, and a very hot summer in which the UK recorded 40˚C for the first time. Following that, UK broccoli yields fell 4.8% and cauliflower 6.9% whilst total production fell 15% and 12% respectively. Following poor harvest in the UK in years since (ECIU), broccoli and cauliflower yields have faced further falls (DEFRA).

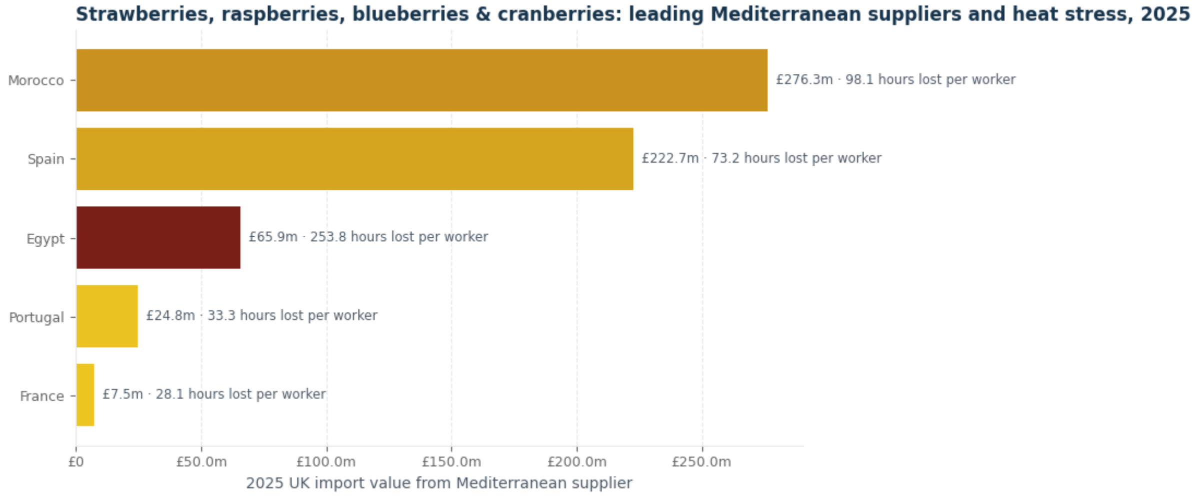
The price per kg in 2024 for imported broccoli and cauliflower was 18% higher than in 2022; in 2025, it was up 24% on that year.

Strawberries, raspberries, blueberries, and cranberries

Much like lettuce, cauliflower and broccoli, our soft fruit import-dependence is seasonal. The UK is highly import-dependent in winter and spring, then partially switches to UK production in summer and autumn. Still, across the year as a whole we are quite reliant on imports, producing just 56% of strawberries and 38% of raspberries in 2025 (Defra).

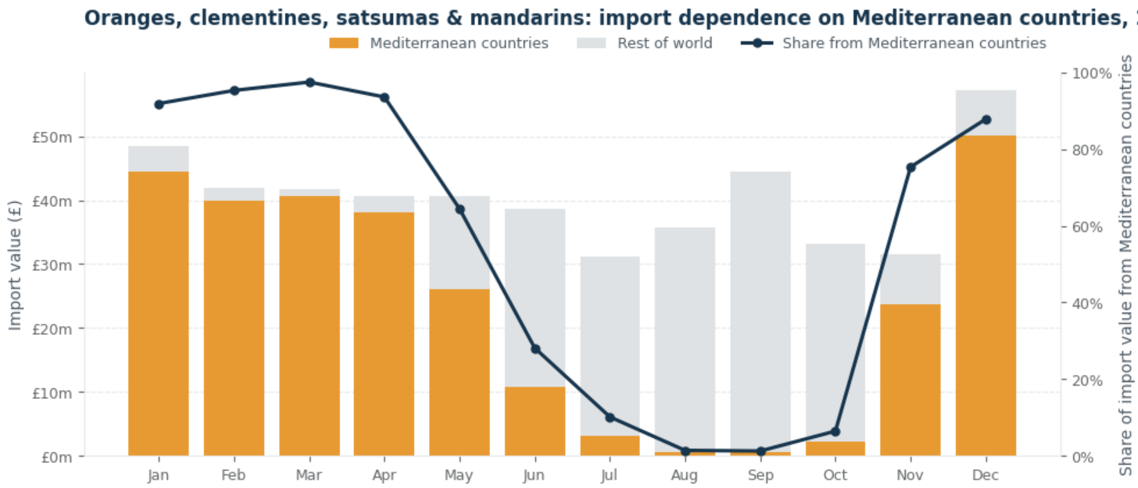
Morocco was our largest supplier in 2025, followed by Spain and Egypt. The reliance on North African producers means that the average number of potential hours lost to heat stress amongst our Mediterranean suppliers was 102 per worker on average among soft fruit suppliers.

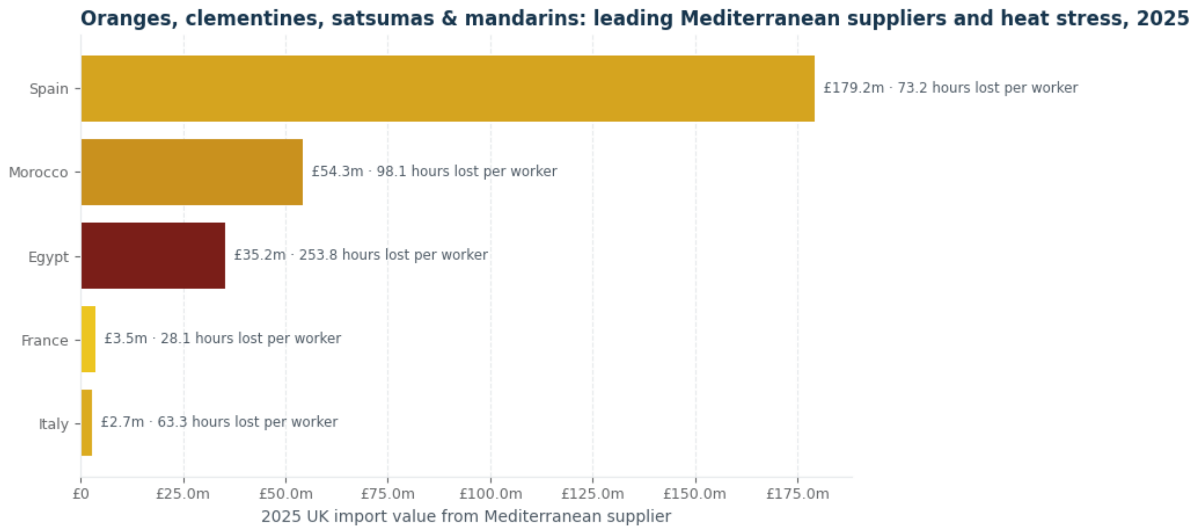




Oranges, clementines, satsumas, mandarins

We are entirely import-dependent for popular citrus fruits such as oranges and clementines, as they do not grow well in a UK climate. While we import these fruit year-round, our dependence on the Mediterranean is highly seasonal, with over 60% of imports coming from the region for the seven months from November to May.





Spain, Morocco and Egypt are the three largest suppliers, meaning the average potential number of hours lost to heat stress in Mediterranean suppliers of these fruits is high, at 102 hours per worker.

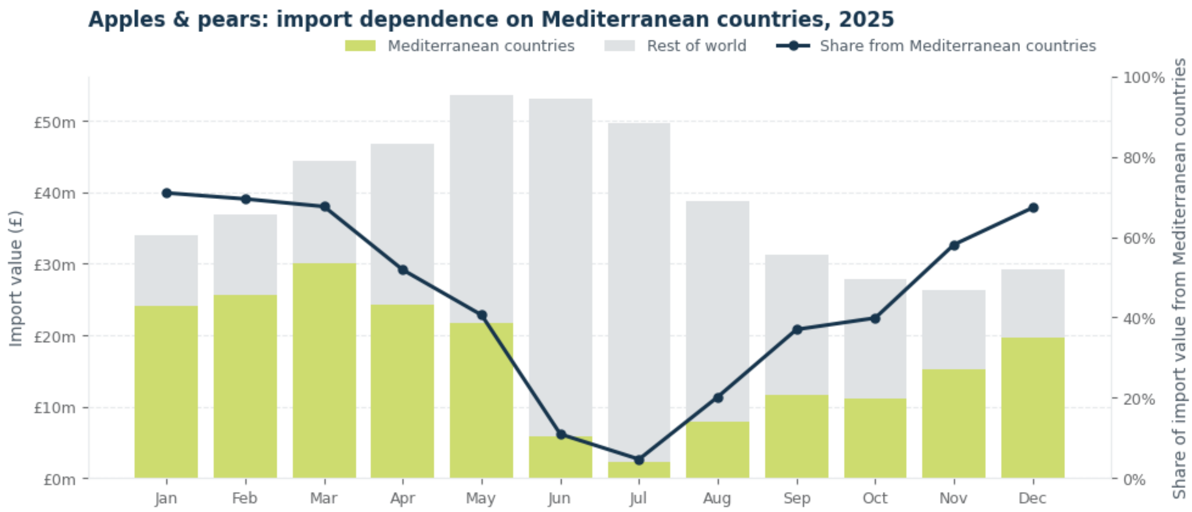
Morocco is the second largest supplier of oranges, clementines, satsumas and mandarins. But citrus fruit imports from the country have been particularly badly hit by extreme weather. Recent years have seen one of the most severe and prolonged drought episodes in Morocco's modern history, stretching across six consecutive years (European Commission), driving water shortages that have hit agriculture. This sort of prolonged drought and extreme heat cuts yields and quality of fruit.

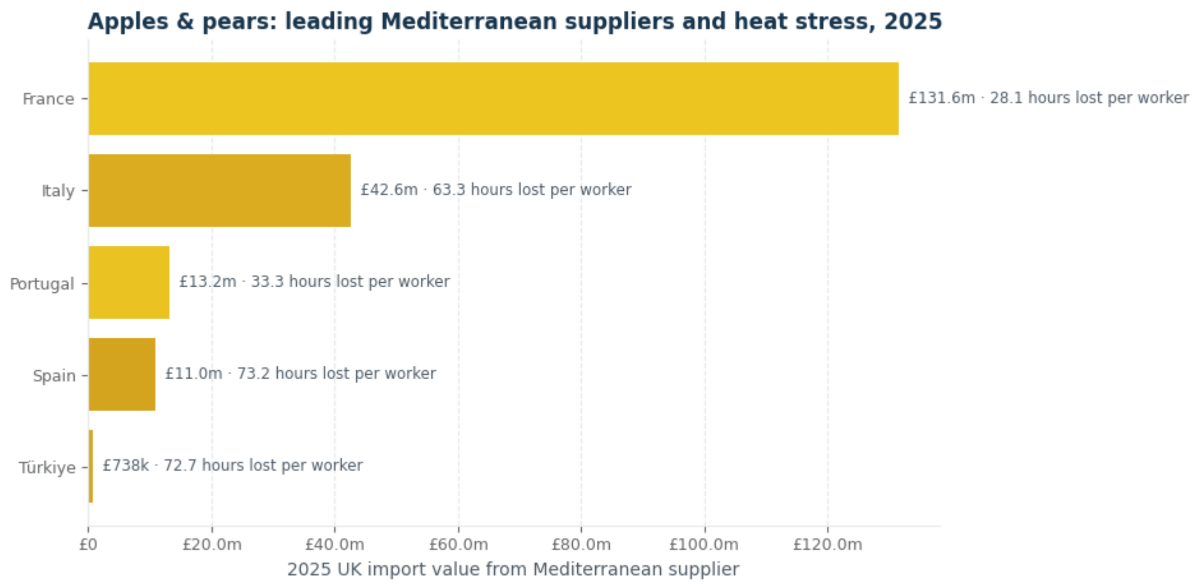
Although the situation has recovered by 2025, from 2022 the cost of import of these fruits from Morocco rose by 18% in 2023, and then again by a further 17% in 2024, as the volume of imports rose just 2%, and then fell by 3%. Price per kg from 2022 to 2024 shot up by 40%.

Apples and pears

The UK produced just 47% of the apples and 19% of the pears we consumed in 2025. Import-dependence peaks in May-July, but Mediterranean import-dependence peaks over winter, accounting for 60% of imports. Over the year as a whole Mediterranean imports account for just over 40% of imports – meaning we are less dependent on the region than we are for many other popular food items.

France accounted for two thirds of imports from the Mediterranean, with Italy and Portugal the next largest suppliers. The average number of hours lost to heat stress by workers in Mediterranean suppliers is 39 hours per worker.





Still, our lower import-dependence does not protect food supply from the impacts of extreme weather. Indeed, reports suggest that this year's harvest in both the UK and France (Fruitnet, 2026) have been severely impacted by drought and repeated heatwaves.

Looking further back, from 2022 to 2025, the cost of our import of apples from the region (mostly from France and Italy) has risen 1% as the volume we buy has plummeted by 19%. The price per kg has risen by a quarter (24%) from £1.08 in 2022, to £1.34 in 2025. Over the same period, pears (mostly from Portugal and France) have risen in price per kg by 45%, from £0.95 in 2022, to £1.38 in 2025.

Between 2022 and 2024, production of both apples and pears was hit in France, Portugal and Italy by successive climate change driven shocks – most notably extreme heat, drought, hail and flooding. Heatwaves reduce yields and fruit quality, whilst flooding causes harvest losses. (USDA and Fresh Plaza).

Solutions

Cutting emissions

The only solution to halt climate change, and avoid ever worsening climate impacts like heat stress, is cutting emissions to net zero, so as to stop adding greenhouse gases to the atmosphere. The Paris Agreement seeks to limit temperature rises to 1.5˚C above pre-industrial levels. At around 1.4˚C of long-term warming (Copernicus), we already see the threats and growing danger; this only worsens with each fraction of a degree of temperature rise.

The global clean energy transition – the principal means of achieving net zero – has been driven by policy decisions flowing from nations' commitment to Paris, with investment in clean energy internationally running at around twice the level of investments in fossil fuels each year (IEA).

Adapting to worsening impacts

Food security is an element of national security, as emphasised starkly in a recent UK national security assessment of the risks posed by global biodiversity loss which warned, in early 2026 that: *"cascading risks of ecosystem degradation are likely to include geopolitical instability, economic insecurity, conflict, migration and increased inter-state competition for resources*."

Protecting that food security means supporting farmers to adapt to the climate impacts we're seeing now, at the current rate of warming, especially as we remain on track, if all nationally determined contributions are delivered, for temperature rises between 2.3˚ and 2.5˚C (or 2.8˚C on the basis of current policies). Farmers, everywhere, are among some of the most vulnerable to climate extremes.

Climate finance from wealthy nations to countries with low climate readiness is a key part of the solution, supporting farmers to adapt to climate impacts. This can be about measures to reduce exposure to heat stress for agricultural workers, as well as about adapting crops and farming methods to cope better with climate change-driven extremes. This can secure both crops and livelihoods – both for consumption at home, and for export. Alongside cutting emissions to net zero, to limit further temperature rises, this will help reduce volatility in our food system. In turn, this supports British retailers in keeping supplies and prices stable for UK consumers.

Yet despite this, and growing warnings of the rising threat of a food crisis, the UK has reduced its commitment to climate finance for the coming three years. Although climate finance remains roughly the same proportion (20%) of the UK's overseas development assistance (ODA) budget as it was before ODA was cut, the annual climate finance commitment for the next three years will total around £2 billion; down from around £2.3 billion in each of the last five years. This frontloads commitments made by the UK to raise its climate finance, and potentially limits our ability to provide additional support to farmers around the world who produce our food, to enable them to adapt to worsening climate change impacts. The UK is also reported recently to be cutting in half the pledged amount that they provide to the Green Climate Fund.

Climate finance, however, only applies to a few of the nations around the Mediterranean. Most of our food imports from the region come from France, Spain, and Italy which, between them, account for 80% of those Mediterranean food imports. For these nations, in common with the UK, adaptation lies in their own hands, and exchequers, as some of the most wealthy and developed nations in the world.

Method Note

This analysis examines the extent to which UK food imports are exposed to rising heat stress across the Mediterranean. The analysis addresses five questions:

- How has agricultural heat stress changed across the Mediterranean since 1990?
- Which Mediterranean countries are most important to UK food imports and how exposed are they to heat stress?
- How have heat-stress trends evolved in key supplier countries?
- Which food categories combine high dependence on Mediterranean imports with high supplier heat stress?
- How do seasonality and supplier concentration shape exposure for selected food groups?

Data

The analysis combines 2025 UK food-import data, commodity-level classifications, and country-level heat-stress data covering Mediterranean countries from 1990 to 2025. The geographic scope is limited to a defined set of Mediterranean food-supplying countries, outlined in the main text of the report.

- 2025 UK food-import data is sourced from HMRC's UK Trade Data.
- Food groupings and commodity level classifications are explained below.
- Country-level heat stress data covering Mediterranean countries has been supplied to us by Chris Freyberg and Bruno Lemke of the Ruby Coast Research Centre. This been used to inform indicator 1.1.3.1 – loss of potential work hours – in Romanello M, Walawender M, Hsu S et al. *The 2025 report of the Lancet Countdown on health and climate change: climate change action offers a lifeline*, The Lancet, 2025; 406, 2804-2857.

Key measures

Import exposure

Throughout the report, import exposure is measured using the value (£) of imports rather than physical volumes. For example, UK exposure to Spanish olive oil is calculated as the value of olive oil imported from Spain divided by the total value of olive oil imported into the UK.

Using import values provides an indication of the economic importance of different suppliers and products within UK food supply chains. Monthly trade data are also used to assess how reliance on Mediterranean suppliers varies throughout the year, highlighting periods when UK exposure to Mediterranean production is greatest.

<u>Heat stress</u>
Heat stress is measured as potential agricultural work hours lost due to extreme heat, expressed either as:

- hours lost per agricultural worker; or
- total hours lost across the agricultural workforce.

The headline Mediterranean indicator is workforce-weighted and calculated as:

- Total potential agricultural work hours lost ÷ total agricultural employment.
- This ensures that countries with larger agricultural sectors contribute proportionately to the regional trend.

<u>Food-group heat exposure</u>
For individual food groups, supplier heat stress is weighted by the value of UK imports from Mediterranean suppliers:

- Σ (import value × supplier heat stress) ÷ Σ import value.
- This provides an indication of the average heat-stress exposure associated with the suppliers on which the UK relies most heavily.
- The analysis is designed to assess exposure rather than predict future supply disruptions, production losses or food-price impacts. Higher exposure indicates greater reliance on suppliers operating in regions experiencing elevated heat stress but does not in itself imply that disruption will occur.

Commodity classifications

Share of food imports

We analyse the composition of UK food imports from the Mediterranean countries in 2025, based on import value.

To do this monthly trade data were restricted to the selected Mediterranean supplier countries and commodities were grouped using the Harmonized System (HS) commodity-code hierarchy.

HS codes are structured hierarchically. The first two digits identify a broad commodity chapter - for example, HS 07 covers edible vegetables, roots and tubers; HS 08 covers edible fruit and nuts; HS 20 covers preparations of vegetables, fruit and nuts; and HS 22 covers beverages, spirits and vinegar. The first four digits provide a more detailed product heading within each chapter. For example, within HS chapter 19, which covers preparations of cereals, flour, starch or milk, HS 1902 identifies pasta, noodles and couscous, while HS 1905 identifies bread, pastry, cakes and biscuits.

For this analysis, most commodities were grouped according to their two-digit HS chapter. A small number of categories were separated at the four-digit level where the broader chapter would otherwise combine substantively different foods. In particular, pasta, noodles and couscous (HS 1902) and bakery, biscuits and cakes (HS 1905) were separated from the remainder of chapter 19.

Wine and olive oil were treated as separate categories explained below, rather than simply being grouped within their wider HS chapters. This maintains consistency with the more detailed analysis of these products elsewhere in the report.

Import values were then summed within each resulting food category and divided by the total value of UK food imports from all selected Mediterranean countries. The percentages therefore show each category's share of Mediterranean food imports to the UK, rather than its share of total UK food imports from all origins.

Deep dives

We then do a series of deep dives looking at particular food groups. To do this, we classify wine and olive oil using the commodity descriptors below. We also implement a categorisation of the UK's most 20 popular fruit and veg using the Fresh Produce Journal's Big 50 Products, 2023. This list identifies and ranks the 50 best-selling fresh fruit and vegetable products over the previous year in UK supermarkets

1. Apples
2. Tomatoes
3. Grapes
4. Strawberries
5. Bannanas
6. Blueberries and cranberries
7. Easy peelers
8. Mushrooms
9. Peppers
10. Raspberries
11. Cucumbers
12. Onions
13. Cauliflower and Broccoli
14. Lettuce
15. Pears
16. Carrots and Turnips
17. Avocados
18. Oranges
19. Melons
20. Beans