Kwizda Xperience

FAQ

KX Vine EN

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General

How can I start the KX Vine?

As a web app, KX Vine does not require installation and can be used on mobile phones, tablets, and PCs. This enables flexible work and easy access, regardless of your location.
You can access the KX Planner using the following link: https://vine.kx-digital.com/
You can also access it by scanning the QR code below:

How do I log in to the app?

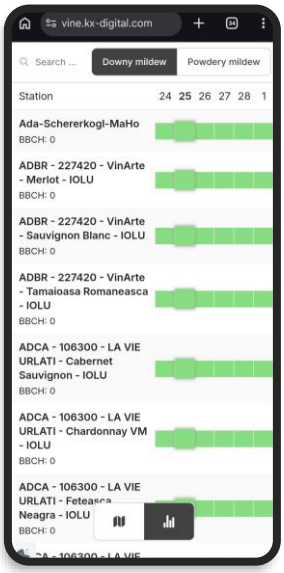
You must register before you can use KX Vine.
For detailed information on registration and managing your user profile, please visit the following link: https://www.kx-digital.com/faq-user-en

How can I save the KX Planner on my smartphone?

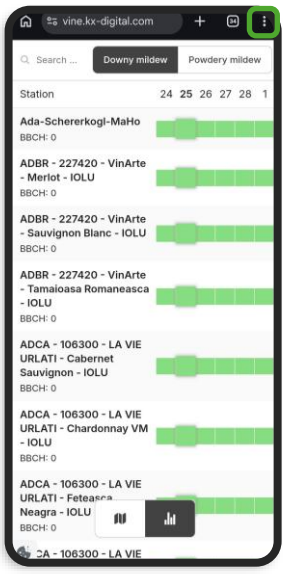
You can add the web app to the home screen of your mobile device for quick and easy access to the KX Planner.

Android e.g.: Samsung

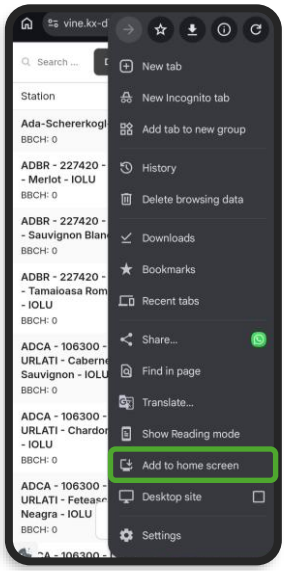
01. Open a browser app such as Google Chrome, enter the app address of KX Services in the browser's address bar, and log in with your KX user account.



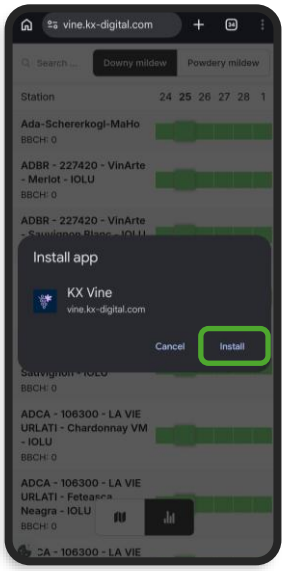
02. Tap the three dots in the top right corner.



03. Select the option 'Add to Home screen'.



04. Tap 'Install' to automatically place the website icon in a free spot on your home screen.

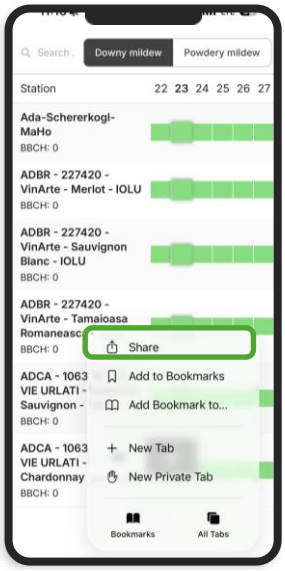


05. The shortcut to the website is now arranged on your home screen just like your installed apps.

iOS

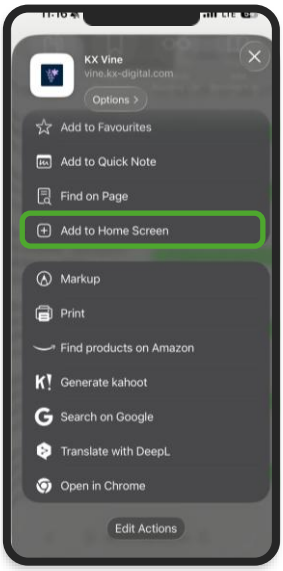
01. Open the Safari browser on your iPhone or iPad, enter the app address of the KX Service in the browser's address bar, and log in with your KX user account.
Then tap the three dots.

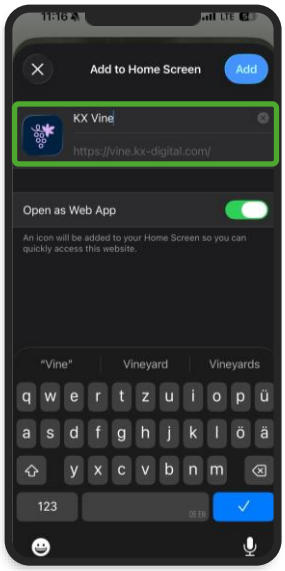
02. Tap the 'Share' button (a small square with an upward arrow).



03. Expand the menu.
Here you will find the option "Add to Home Screen".

04. Enter a meaningful title so you can easily identify the icon on your home screen in the future.





05. By tapping "Add" an app icon for the website is automatically placed in a free spot on your home screen. The shortcut to the website will now appear on your home screen just like your installed apps.

How can the language of the KX Vine app be changed?

The app's language is determined by your browser's language settings. Technically, the browser sends the preferred language in an HTTP header called accept-language. If the app supports this language, it will be displayed accordingly. If the selected language is not available, the app will default to English.
Most browsers, such as Chrome, Edge, or Firefox, allow you to change the language settings. This preference is stored in a cookie. Therefore, after changing the language, it's important to either delete your cookies or open the app in a private/incognito browser window to ensure the new language setting takes effect.

How can a location or a virtual forecast station be searched?

To find a specific location, use the search bar in the top-left corner. You can enter the desired location, a postal code, or the name of a station.
The entered text filters the displayed list of stations according to the search term.
After pressing the Enter key, a targeted search is performed for the entered locations or stations, even if they are not currently visible on the map.
If the search does not return any results, you can refine it by adding the appropriate country code along with the location or postal code.

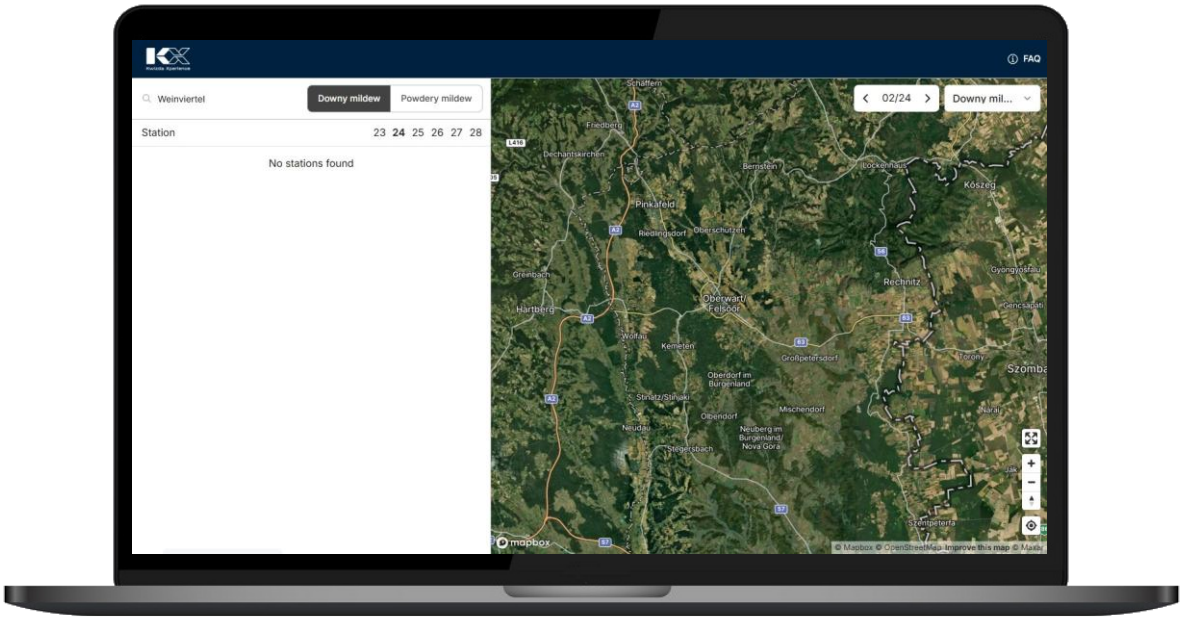
The following country codes can be used:

- AT - Austria
- HU - Hungary
- RO - Romania
- DE - Germany

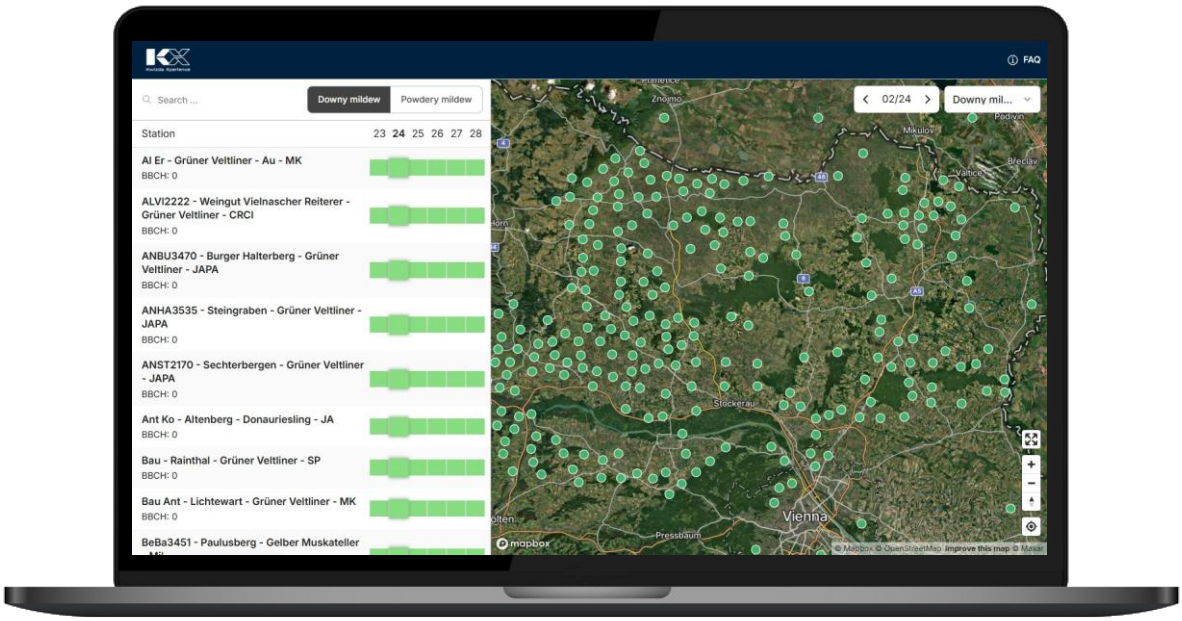
You can find all other country codes here:
List of country codes by alpha-2, alpha-3 code (ISO 3166)

How do I use the search function correctly?

Use the search bar in the top-left corner. Please note that at first, only those stations are displayed that lie within the currently visible map area.
If there are no matching results for the entered search term within the visible map section, the message “No stations found” will appear initially.



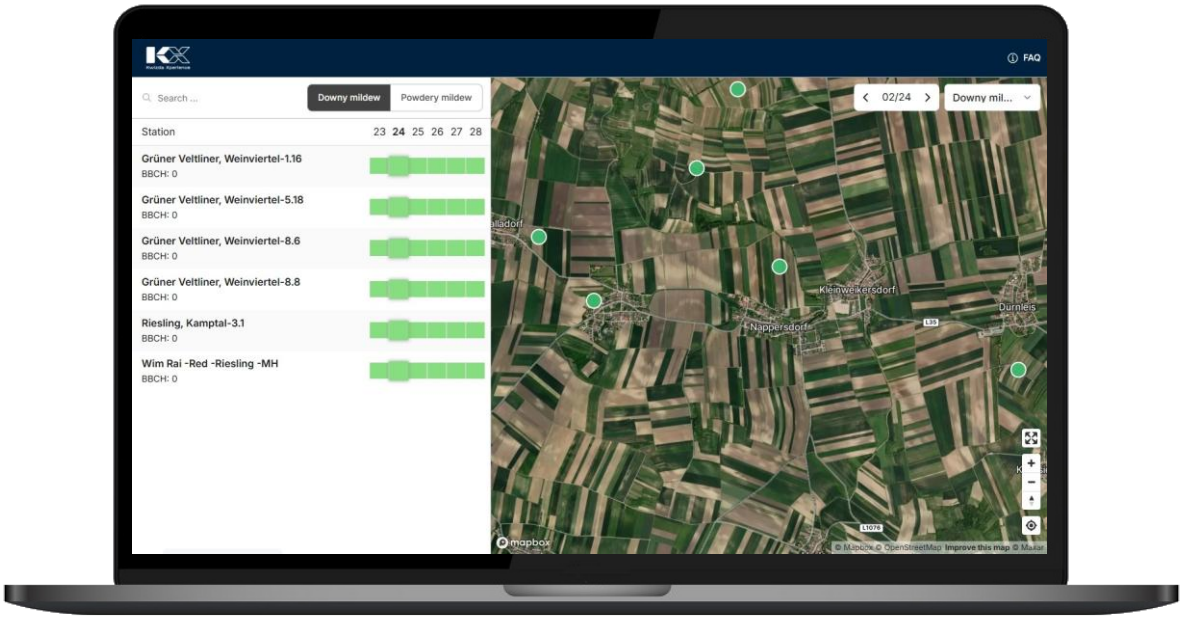
The search query “Weinviertel” does not produce any results within the currently displayed map area.
When the search is then confirmed by pressing Enter, KX Vine compares the entered search term with all virtual stations stored in the system and automatically shifts the map view to the corresponding region.



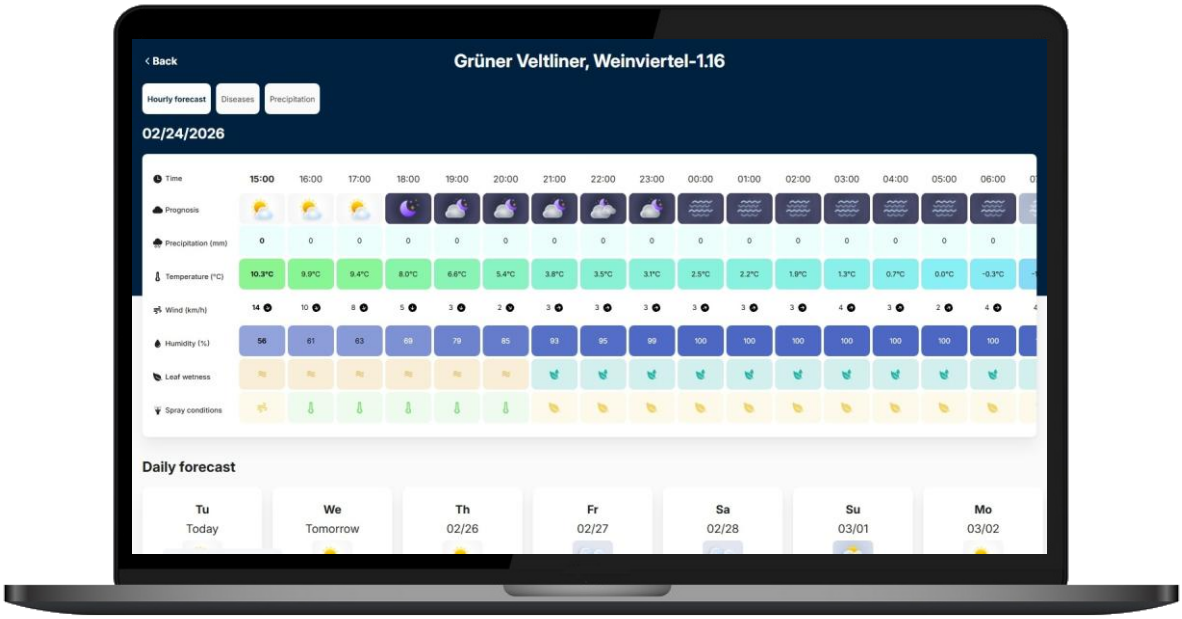
After pressing the Enter key, KX Vine also checks locations outside the current map view and displays all stations in the entire system that match the search criterion “Weinviertel”.

How can a virtual station be selected?

To select a virtual station, either click on the name in the list view or on the desired point on the map.



By clicking on the desired station, you can view the associated station parameters.



Weather

Why are no physical weather stations required for the system?

Physical weather stations do not generate weather forecasts. Forecasts are produced by large-scale weather models that run on high-performance supercomputers.
KX Vine uses a service provided by VineForecast, which accesses data from various weather models and adjusts the model calculations to the local topography of each specific location.
This allows the general weather situation to be translated into the microclimate of a vineyard much more accurately.

How are the weather forecasts calculated?

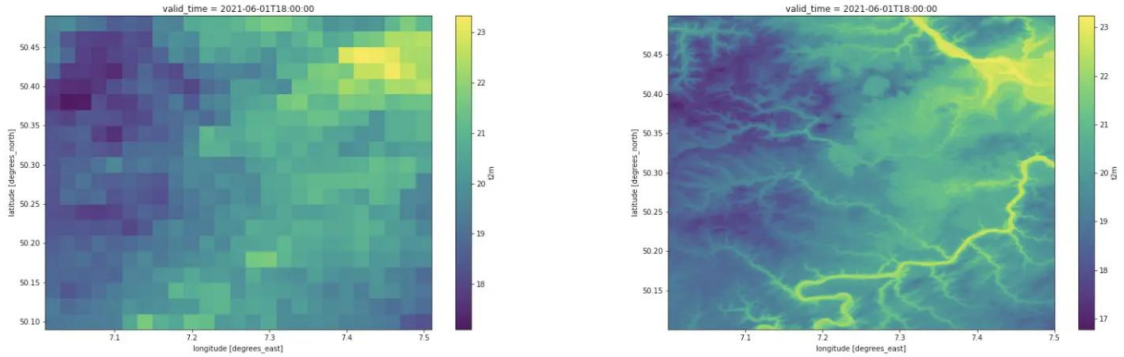
Weather forecasts are calculated by weather models that use the laws of physics to predict the development of the weather. This method is also known as numerical weather forecasting. As this requires huge amounts of computing capacity, weather forecasts are mainly calculated by weather services such as the German Weather Service (DWD) in Offenbach or the National Oceanic and Atmospheric Administration (NOAA) in the USA.

Measurement data from weather balloons, satellites, and weather stations continuously inform these weather models about the current state of the atmosphere. Measurement data must come not only from one region but also from all over the world and from different layers of the atmosphere.

As a basis, VineForecast obtains weather models from the German Weather Service (e.g. temperature, precipitation, humidity, etc.). Ideally, however, this data only has a resolution of 1-2 km. If this raw data were fed into a disease model, the accuracy would be very low. To increase the accuracy, VineForecast uses a method from climate physics.

Downscaling (https://www.vineforecast.com/downscaling-regionalisieren-von-wetterdaten/), also known as regionalization, makes it possible to include regional influencing factors in the weather forecast. Among other things, the local topography with a resolution of 50 meters is used to adjust weather data. This allows, for example, the effects of different altitudes or slope inclinations to be included.

The effect is illustrated by the following example of temperature adjustment. The image shows a map section of the Moselle (Germany) with a scale of 50x50 km. The left image shows the DWD's standard model for temperature with a resolution of 2x2 km. The right image shows the optimized model from VineForecast with a resolution of 50x50 m.



You can find out more about numerical weather forecasts on the website of the German Weather Service:
https://www.dwd.de/EN/research/weatherforecasting/num_modelling/num_modelling_node.html;jsessionid=77E962CCDAD1047DE6789F71DFF5D41D.live21064

Where does the precipitation data come from?

Precipitation data is used for forecasting by weather models. Historically, V4C can further improve the statements on the amount of precipitation in some regions by using radar data from rain radars as an additional data source.

How long is the forecast horizon for the hourly and daily weather?

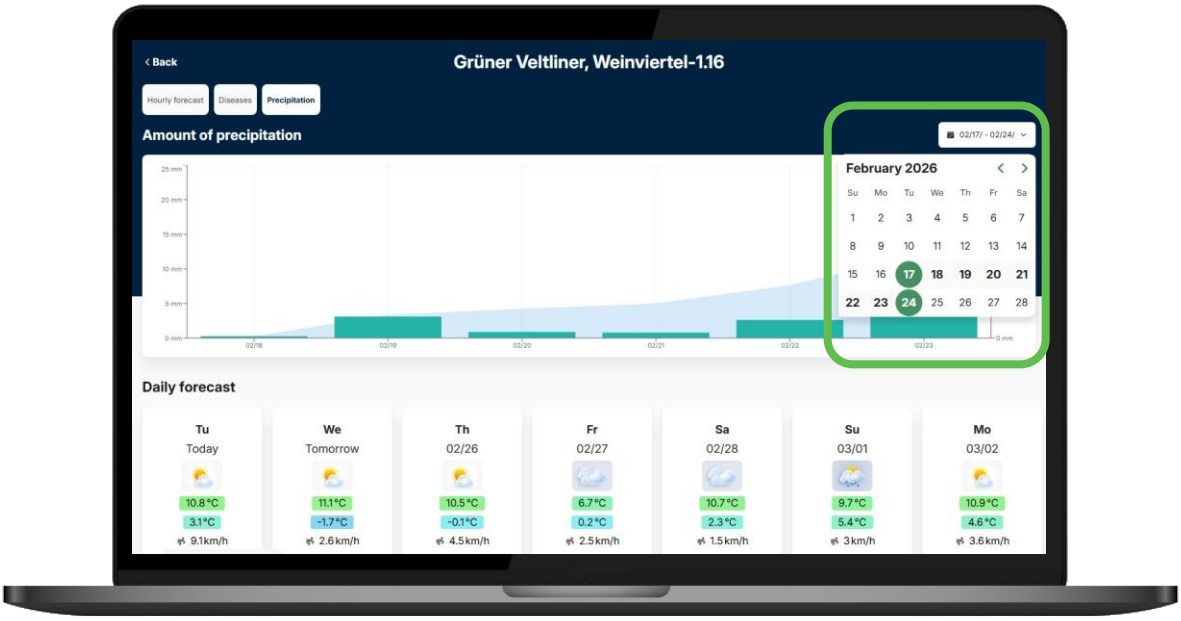
- Hourly forecast: 48 hours
- Daily forecast: 7 days

How does KX Vine calculate the spraying conditions in the daily weather view?

The spraying conditions in the daily weather view are calculated based on the spraying conditions from the hourly weather data.
The system displays the symbol that occurs most frequently throughout the day.
For example:
If the spraying conditions are optimal for 12 hours (“green check mark”), it rains for 8 hours (“yellow cloud”), and the conditions are unsuitable for 4 hours (“red cross”), then the daily view will show a green check mark, because this is the dominant spraying condition for that day.

Can the time period of the precipitation history be adjusted?

After selecting a station, you can display the precipitation history by clicking the “Precipitation” button in the upper left corner.
You can then set the desired time period using the date selection in the upper right corner.



When is which symbol displayed in the spray weather?

The spray weather is displayed in both the hourly and daily weather. In the daily weather, the symbol that is most frequently present in the hourly weather on that day is displayed.

Optimal conditions

- Green checkmark (“optimal spraying weather”)
  - Is displayed if the weather has no significant influence on crop protection.

Sufficient conditions

- Green drop (“low humidity”)
  - The air humidity is low (below 45%). This can have a negative effect on the crop protection product applied, e.g. through volatilization.
- Green thermometer (“low temperature”)
  - The temperature is relatively low (below 12°C). This can have a negative effect on some crop protection products (e.g. slow uptake by the plant).
- Yellow leaf (“leaf wetness present”)
  - It can be assumed that the leaves are partially wet at this time. Under certain circumstances, this can lead to increased dripping of the crop protection product.
- Yellow wind symbol (“increased wind speeds”)
  - The wind speed is over 3 m/s (10.8 km/h). This can lead to increased drift.
- Yellow rain cloud (“precipitation”)
  - Precipitation can cause the crop protection product to be washed off.
  -

Inadequate conditions

- Red Cross ("Insufficient spraying conditions")
    - The conditions for spraying are **insufficient** at this time. The temperatures are higher than 25°C and/or the wind speed is higher than 5m/s and/or the relative humidity is lower than 30%."

How is leaf wetness calculated?

Leaf wetness or leaf wetness duration is derived from relative humidity, as there is a strong correlation between these two variables (see e.g. research by Sentelhas et al., 2008).

References

- Sentelhas, P. C., Dalla Marta, A., Orlandini, S., Santos, E. A., Gillespie, T. J., & Gleason, M. L. (2008). Suitability of relative humidity as an estimator of leaf wetness duration. *Agricultural and forest meteorology*, *148*(3), 392-400.

How often is the weather data updated?

Four times per day.

Disease forecasts

How are the forecasts for Powdery Mildew calculated?

The disease forecasts are based on the latest findings in viticulture research.
The models used in this area rely, among other factors, on weather data such as humidity, temperature, and precipitation. These weather data are calculated directly by VineForecast.

For Oidium, VineForecast uses the OiDiagIndex developed by W. K. Kast as one of its foundational models and enhances it with targeted adjustments based on further research results as well as practical experience.

References

- Kast, W. K., & Bleyer, K. (2011). The expert system OiDiag-2.2–a useful tool for the precise scheduling of sprays against powdery mildew of vine (Erysiphe necator Schwein.). *IOBC/WPRS Bull*, *67*, 79-84.

How are the forecasts for Downy Mildew calculated?

The disease forecasts are based on the latest viticultural research. The models from viticulture research are in turn based on weather data such as humidity, temperature or precipitation. VineForecast calculates this weather data itself, as explained here.

For the Downy Mildew forecast, different models depending on the phase are used. Oospore germination and primary infection are calculated similarly to the model of Rossi et al. (2007). Secondary infections are calculated using the leaf wetness hours (Bläser & Weltzien, 1979). The risk index is calculated from the sum of temperatures during hours of leaf wetness (for each day). If the value is above 75, there is a slight risk of infection. If the leaf wetness hour is higher than 200, a high risk of infection can be assumed.

References

- Blaeser, M., & Weltzien, H. C. (1979). Epidemiologische Studien an Plasmopara viticola zur Verbesserung der Spritzterminbestimmung/Epidemiological studies to improve the control of grapevine downy mildew (Plasmopara viticola). *Zeitschrift für Pflanzenkrankheiten und Pflanzenschutz/Journal of Plant Diseases and Protection*, 489-498.
- Rossi, V., Caffi, T., Giosue, S., & Bugiani, R. (2008). A mechanistic model simulating primary infections of downy mildew in grapevine. *Ecological modelling*, *212*(3-4), 480-491.

Are risks related to black rot and Botrytis also represented in KX Vine?

The actual risk of a black rot infection strongly depends on whether there are fallow or poorly maintained vineyards in the surrounding area that can serve as sources of infection. This critical factor is not adequately considered in existing research models.
For Botrytis, on the other hand, cultivation practices such as canopy management influence the infection risk just as strongly as weather conditions. Current models, which rely primarily on weather data, cannot reliably quantify these factors. As a result, risk assessments are often inaccurate.
For these reasons, KX-Vine currently does not include separate models for black rot or Botrytis.

Note:
Black rot—similar to downy mildew—is favored particularly by long leaf wetness periods.

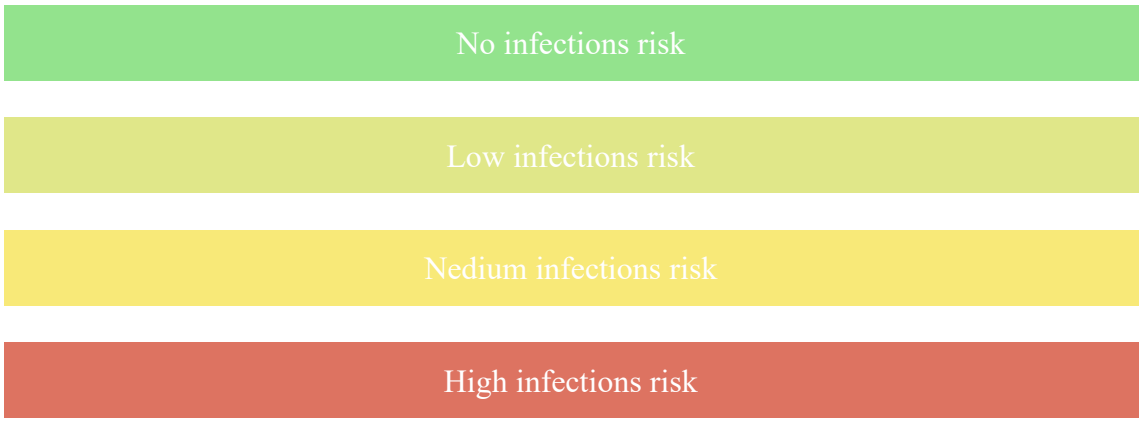
Therefore, in regions where black rot is known to occur, the downy mildew model can be used as a rough guide to identify potential infection conditions.

How should the disease forecasts be interpreted?

The infection forecasts indicate how high the risk of new infections is on a given day. They therefore do not describe the current condition of the vine or whether visual symptoms of a disease are visible. The infection forecasts therefore describe the potential for the vines to become infected with a disease for the first time or the risk of an existing disease spreading further and infecting healthy plant material.

What do the colors of the infection forecasts mean?

KX Vine communicates disease risks as simply and purposefully as possible. The risk display is shown in the form of a traffic light system:



How are the leaf area and the growth of the vines calculated?

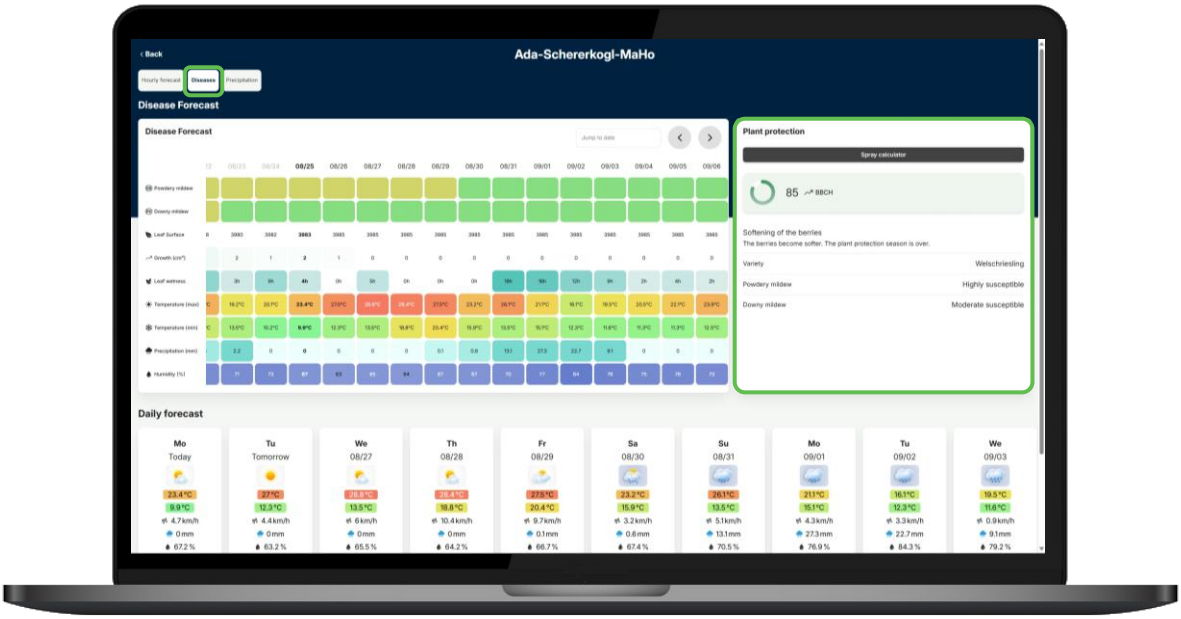
The disease forecasts are based on the latest viticultural research. The leaf area and growth of the vine is calculated using temperature totals. Daily mean temperatures (usually starting on January 1st) are added up. Certain values of the temperature sum can then be assigned to stages of the vine's development. For example, based on the research of Prof. Schultz from Hochschule Geisenheim University.

References

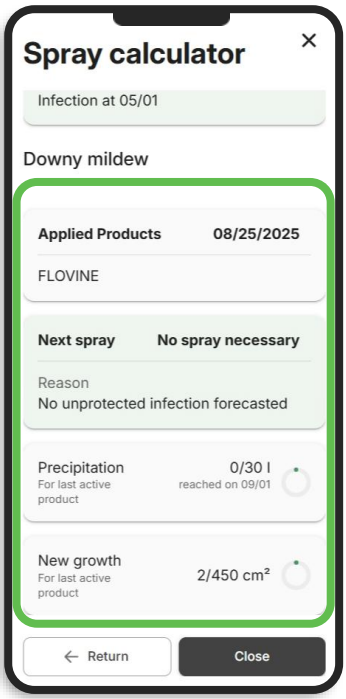
- Schultz, H. R. (1992). An empirical model for the simulation of leaf appearance and leaf area development of primary shoots of several grapevine (Vitis vinifera L.) canopy-systems. *Scientia Horticulturae*, *52*(3), 179-200.

How are the protection parameters to be interpreted?

The KX Vine app offers a feature for assessing the protection status of vines after plant protection treatment. It takes into account the date and the products used in the most recent application (based on active substance and formulation). Additionally, current weather data and growth parameters are included in the calculation. Based on this information, the app determines the current BBCH growth stage and suggests an optimal time for the next plant protection treatment. The BBCH stage provides context on whether the vine is in a particularly vulnerable phase of development. Especially around flowering, vines are highly susceptible to powdery and downy mildew, making an accurate assessment of protection effectiveness particularly important during this period.



The effectiveness of protection depends primarily on the regrowth of leaf area and the amount of rainfall since the last application. Contact agents typically lose their effectiveness once approximately 400 cm² of new leaf area has developed. Additionally, rainfall can reduce the protective effect. For most contact agents, wash-off effects are expected with rainfall amounts between 20 and 40 mm, especially during heavy rain.
Systemic agents offer longer-lasting protection and remain effective even with leaf growth of up to 600–700 cm². The app takes these differences into account and provides an assessment of whether the vines are still adequately protected or if and when another treatment is necessary.

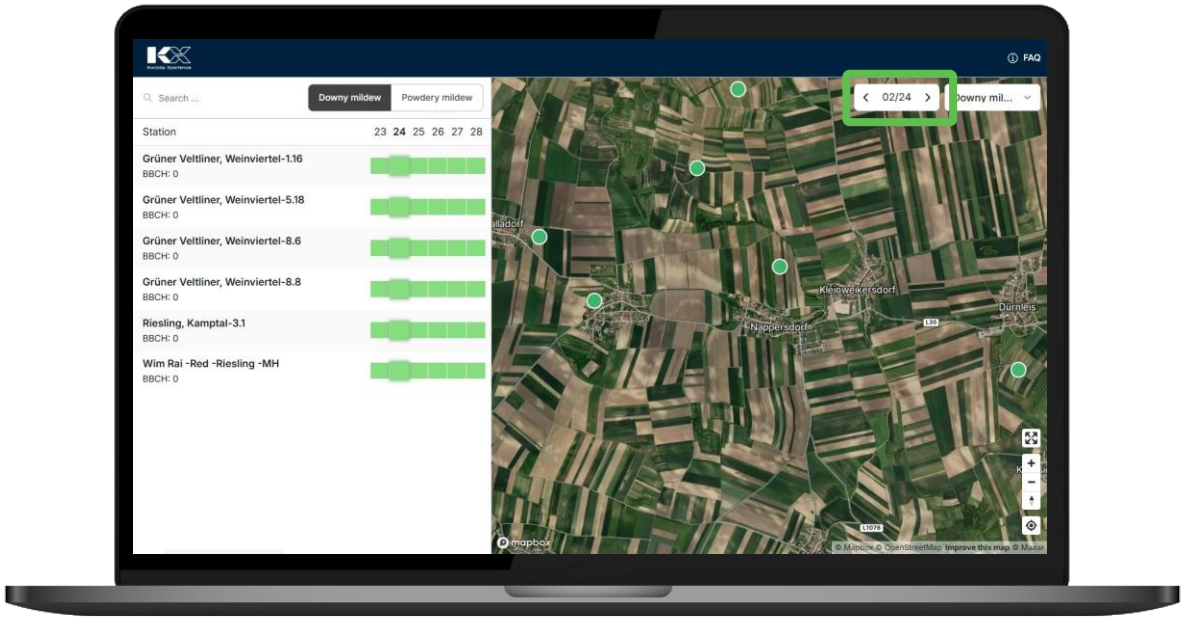


Does KX Vine take water volume into account when calculating protection intervals?

KX Vine generally assumes that plant protection products are applied according to good agricultural practice — meaning with a plausible water volume appropriate for the growth stage, and in line with the manufacturer's recommendations or the typical guideline values for that phase of the season.

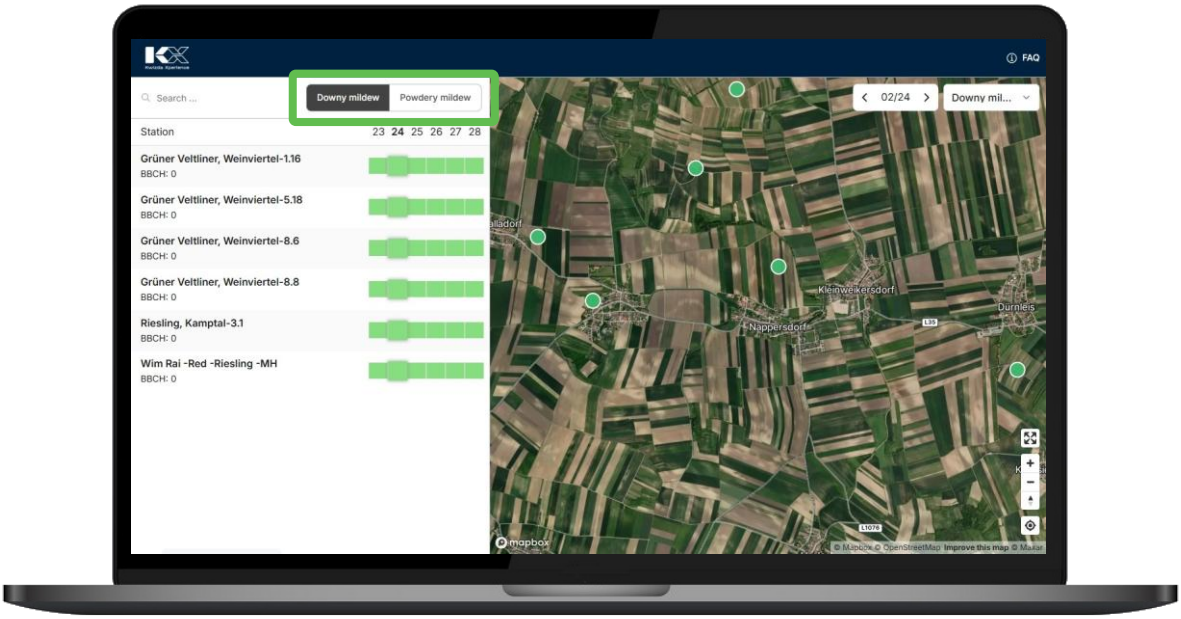
Which day of the infection forecast is displayed on the map and how can I change the displayed day?

The date for which the current infection forecast is shown on the map is displayed at the top right of the map. You can also change the date there using the arrows.



For which disease is the infection prognosis displayed on the start page?

A distinction can be made in the display between Powdery Mildew and Downy Mildew. Above the station list, you will find the button that can be used to select the respective illness for which the forecast is to be displayed for the previous, current and next four days



How are the forecasts for the BBCH stage calculated?

The BBCH model is based on the study by Molitor et al. (2020). In this model, the BBCH stages 1 - 89 are calculated based on temperature sums formed from bud burst (BBCH 9). To use the model in practice, the BBCH model must be linked with a bud burst model. This system relies on the study by Leoloni et al. (2020). As long as the bud burst model does not calculate a bud burst, no calculations are performed by the BBCH model. In other words, the bud burst model calibrates the BBCH model.
The BBCH model differentiates between 12 different grape varieties in the calculation of BBCH stages. In KX-Vine, the remaining grape varieties are each assigned to the grape variety from the study by Molitor et al. (2020) that is phenologically most similar to them.
The BBCH stages 1-7 are also calculated by the BBCH model. For this, the calculation from BBCH 9 from the bud burst model is used. The temperature sums are formed relative to BBCH 9 and are thus negative for BBCH 1 - 7. The following table from the Molitor study illustrates this.

BBCH stage	Riesling	Rivaner	Elbling	Gewürz-traminer	Pinot blanc	Auxerrois	Sauvignon blanc	Pinot gris	Chardonnay	Merlot	Pinot noir
01	-43	-45	-45	-44	-42	-43	-40	-41	-45	-44	-45
03	-31	-34	-35	-34	-33	-33	-31	-32	-39	-33	-35
05	-24	-28	-28	-26	-25	-23	-20	-25	-31	-23	-26
07	-13	-15	-19	-18	-14	-14	-13	-13	-23	-13	-16
09	0	-5	-11	-9	-7	-1	-3	-1	-16	0	-6
11	7	6	-2	2	2	5	6	6	-8	7	5
12	15	12	2	10	11	12	10	13	3	13	10
13	22	18	9	19	20	18	17	18	8	19	16
14	37	27	17	25	30	29	35	32	17	28	26
15	47	44	26	42	45	44	46	49	31	46	42
16	60	61	41	54	61	60	59	60	47	59	55
17	77	74	54	68	78	73	85	77	57	75	71
18	90	86	64	79	88	87	98	90	69	90	80
19	109	102	77	92	106	106	116	116	86	106	100
53	55	57	47	54	51	51	56	54	41	50	49
55	82	71	69	92	80	78	81	79	67	80	71
57	159	150	147	158	157	161	168	163	129	168	151
61	222	214	216	221	215	217	231	213	180	218	202
63	233	226	228	231	226	232	247	223	195	229	218
65	243	236	239	239	235	247	262	234	208	240	229
68	261	250	255	258	251	263	273	252	227	257	241
69	269	260	265	266	265	274	286	264	236	270	250
71	284	272	278	284	281	293	302	280	251	289	266
73	316	306	315	325	297	325	338	308	287	323	301
75	407	391	398	422	402	412	431	401	376	375	385
77	461	489	433	471	439	453	478	434	424	522	513
79	538	608	497	537	513	545	570	503	526	670	627
81	777	653	760	740	752	752	764	730	746	784	731
83	798	687	782	766	781	773	788	766	769	800	763
85	820	719	801	792	804	792	808	792	788	834	788
89	997	948	1009	948	986	976	966	979	976	997	940

Fig. 2. Heat map of the average $CDD_{10,20,30}$ values relative to BBCH 09 in Riesling until the respective BBCH stage was reached in the 11 cultivars of investigation. In each BBCH stage, the cultivar with the lowest $CDD_{10,20,30}$ value (=earliest development) is depicted in green and the cultivar with the highest $CDD_{10,20,30}$ value (=latest development) in red. Intermediate values are presented in graduated colours between green and red. (For interpretation of the references to colour in this figure legend, the reader is referred to the web version of this article.)

References:

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