CropMonitor™ – User Information

Release notes – August 2018

The following updates are also incorporated into the notes below.

On the map view, if light leaf spot is selected from the Oilseed rape menu, the regional boundaries are statistically defined specifically for light leaf spot, and the red, amber or green colour is graded to indicate level of risk.

Current data risk icon is removed from the left hand navigation and replace by a table showing cultivar specific risk predictions. This is found at the top of the risk predictions section on the site view for all wheat pests/diseases. The user can select which cultivar they would like to see risk estimates for. The following pests/disease are included in the table;

- Brown rust
- Powdery mildew
- *Septoria tritici*
- Yellow rust
- Orange wheat blossom midge
- Aphids (only during the autumn)

The local daily infection risk table in the site view, has been updated to include forecast risk estimate for the upcoming 7 days which are based on both observed and forecast weather. The current day is highlighted in blue, and forecast risk estimates are highlighted in yellow.

For the York case study site, derived weather variables are now available in the weather section. The additional charts are available in the section called Derived weather indices for *sitename*   They are;

- Accumulated mean daily temperature
- Accumulated daily rainfall
- Accumulated frost days

Summary

Upgrades to the website functionality and content will be made available over a series of releases throughout 2018 and early 2019. Each release will focus on adding a set of new features or improving existing features.   This document will be updated for each release to include release notes for the current version.

The site consists of the following areas:
1. Home page
2. Live monitoring. Includes a regional map view and links to a site-specific view
3. Summary reports of live monitoring activity
4. Risk forecast for spring beans downy mildew
5. Surveys of commercially grown crops
   a. Winter wheat
   b. Winter oilseed rape

1. Home Page

- o Introductory text
- o Headlines – including links to the relevant pages within the site
- o What's New section – latest news from CropMonitor™ including links to view reports
- o Image of live monitoring UK map, which can be used as a link to the live monitoring pages.
- o Link to register for alerts and receive BASIS and/or NRoSO points

2. Live monitoring

a) Map view

- The map zoom can be toggled using the buttons on the bottom right of the map view
- Left hand menu allows user to navigate between crops and weather information. These currently include Weather, Wheat, Oilseed rape, Barley and Potatoes. Crop menus can be expanded by clicking the arrows v or ^. This will display Growth stages information, and pests/diseases that are being monitored for each crop. Selecting a menu item will update the map accordingly.
- The regional boundaries on the map have been defined statistically to indicate clusters of counties which differ significantly in their historical disease risk.
- Risk predictions are available for diseases and pests of wheat only. Similar services for potatoes, oilseed rape and barley will form part of future releases.
- If there is a regional risk forecast available for a pest or disease, the map regions will be coloured red (high risk), amber (medium risk) or green (low risk). If there is no colour, there is no regional risk available. For LLS the shade of red, amber or green is graded to indicate level of risk.
- The definition for each risk description is displayed across the top of the map view, and for some pests/diseases can be toggled; this will change the regional risk colour accordingly. When the user first lands on the page the default view will be for *Septoria tritici* on a moderately susceptible variety of wheat.
- The user can toggle between the risk for susceptible cultivar, moderately susceptible cultivar, and a resistant cultivar using the toggle at the top of the page. The regional risk colour will change accordingly.
- Weather monitoring sites are identified by a marker pin. Pins with a person on them are sites where there is both a met station and pest/disease monitoring. These are known as CHAP monitoring sites.
- The York site marker pin may also be displayed in either red, amber or green indicating the current day risk at the York CHAP monitoring site.   This is because the York site is a case study site demonstrating the additional site-specific risk information which will be included when the subscription service is launched.
- Clicking a site marker will navigate the user to site specific information for that site.

b) Site view

- Users can toggle between crops and pests/diseases for a specific site using the left-hand menu.

- Site information is displayed in the top left corner underneath the CropMonitor™ logo. This includes the Station name, the CropMonitor™ station ID, and the latitude and longitude.
- A National Summary report for the chosen crop/pest combination is displayed to the right of the Site information. This is the relevant content from the daily summary of the current monitoring observations.
- The left-hand menu has the following items:
    i. Weather data
    ii. Wheat
    iii. Oilseed rape
    iv. Barley
    v. Potato

- These menus can be expanded by clicking the arrows v or ^. This will display details of what is being monitored.

(i) Weather data

- Weather data is available for all sites from the start of the growing season to the current date
- The weather station network comprises of 80+ stations owned by UK Met Office (UKMO) which have been selected as being agriculturally relevant in terms of their location. A further 30 stations form the CHAP monitoring network which are a series of high specification weather stations each located at sites where detailed crop monitoring is also taking place.
- Forecast weather data for the upcoming 7 days is displayed for 30 monitoring sites where a high specification weather station has been deployed by CHAP. This is visible on the chart *minimum, maximum and mean temperature for the current growing season* , as a dotted line
- The CHAP weather stations update every 15 minutes whereas the UKMO stations update every hour.
- Weather charts are available as follows:
    o Chart showing minimum, maximum and mean daily temperature for the current growing season.
    o Chart showing daily rainfall.
    o Chart showing mean daily relative humidity
    o Chart showing mean daily windspeed
- For the York case study site, derived weather variables are now available in the weather section. The additional charts are available in the section called Derived weather indices for *sitename* They are;
    o Accumulated mean daily temperature
    o Accumulated daily rainfall
    o Accumulated frost days
- Each chart visible may be printed, or downloaded as images in any of the formats; PNG image, JPEG image, PDF document, SVG vector. This can be done using the menu in the top right of the chart box.
- The data period viewable can be amended via a slider for all weather charts

(ii) Wheat

Risk predictions

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- Risk predictions are available for diseases and pests of wheat and oilseed. Growth stage predictions are available for Wheat and Oilseed rape.
- For sites other than the York site, the following message will be displayed; 'Local risk estimates are part of the full subscription service and are currently available free of charge for the York site'.
- The CHAP monitoring site at York is a case-study site, and as such risk information generated for this site is available freely via CropMonitor™.
- Each chart visible may be printed, or downloaded as images in any of the formats; PNG image, JPEG image, PDF document, SVG vector. This can be done using the menu in the top right of the chart box.
- The following risk information is available for York site:

Growth Stage
- Growth stage key for winter wheat
- Chart showing predicted growth stage progression for winter wheat
- Chart showing estimated leaf dynamics for the top 5 leaves for early sowing (6 September)
- Chart showing estimated leaf dynamics for the top 5 leaves for lower bound normal sowing (20 September)
- Estimated leaf dynamics for the top 5 leaves for upper bound normal sowing (20 October)
- Estimated leaf dynamics for the top 5 leaves for late sowing (3 November)

Diseases

- All pests/diseases
  - Table showing the current day cultivar specific risk estimate for pests and diseases affecting wheat. There is a select list to choose the cultivar of interest, and changing the cultivar will display the currently day risk for all pests/diseases in the table specific to that cultivar. The current day cultivar specific risk is currently available for Brown rust, Powdery mildew, *Septoria tritici*, Yellow rust and Orange wheat blossom midge.
- Brown rust
  - Table showing infection risk on a susceptible cultivar (RR 1 – 4), a moderately susceptible cultivar (RR 5 – 6), and a resistant cultivar (RR 7 – 9). Shows risk based on observed weather for previous days and current day, and forecast risk based on both observed and forecast weather.
  - Table showing infection risk as above, but adjusted to reflect spore presence data.
- Eyespot
  - Table showing pre-sowing risk score factors
  - Table showing suggested action based on pre-sowing risk
  - Table showing risk according to the observed spring disease levels
  - Table showing suggested action based on the final eyespot risk score
- Fusarium
  - No risk information available to date. Update to follow.
- Powdery mildew
  - Table showing infection risk on a susceptible cultivar (RR 1 – 4), a moderately susceptible cultivar (RR 5 – 6), and a resistant cultivar (RR 7 – 9). Shows risk based

on observed weather for previous days and current day, and forecast risk based on both observed and forecast weather.

- o *Septoria tritici*
  - Table showing seasonal risk for current year
  - Table showing infection risk on a susceptible cultivar (RR 1 – 4), a moderately susceptible cultivar (RR 5 – 6), and a resistant cultivar (RR 7 – 9). Shows risk based on observed weather for previous days and current day, and forecast risk based on both observed and forecast weather.
- o Yellow rust
  - Table showing infection risk on a susceptible cultivar (RR 1 – 4), a moderately susceptible cultivar (RR 5 – 6), and a resistant cultivar (RR 7 – 9). Shows risk based on observed weather for previous days and current day, and forecast risk based on both observed and forecast weather.
  - Table showing infection risk as above, but adjusted to reflect spore presence data.
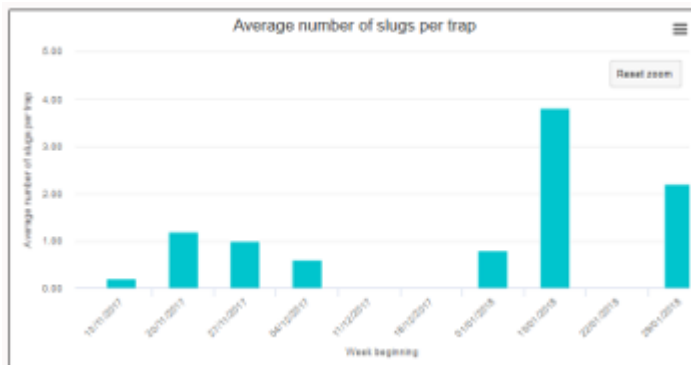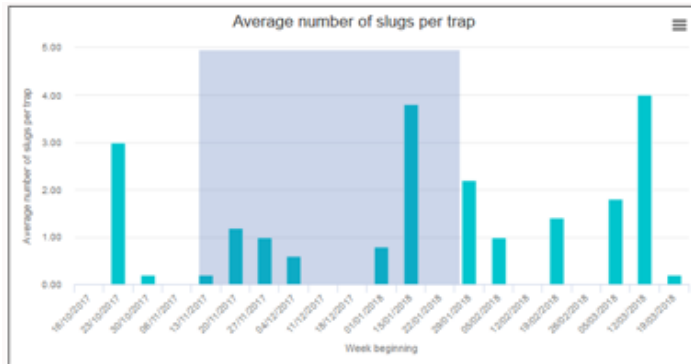
Pests
- o Aphids
  - Risk of more than 4 wheat aphids flying during the autumn months.
  - Predictions remain constant beyond 1 November, as risks are not applicable beyond this date.
- o Orange wheat blossom midge
  - Table showing risk of adults emerging during the crop susceptibility phase, and the estimated adult emergence date for the current and the previous growing season
  - Chart showing predicted phase 1 – larvae emergence
  - Chart showing predicted phase 2 – larvae move to soil surface
  - Chart showing predicted phase 3 – adult emergence
  - Chart showing predicted emergence vs crop susceptibility phase.
- o Slugs
  - No risk information available to date. Update to follow.

Real-time pest and disease monitoring

- Real-time pest/disease monitoring will be shown below the risk prediction section for wheat pests/diseases
- If the site is a CHAP monitoring site, the pest or disease monitoring will be for the site chosen
- If the site is a weather station only, the pest or disease monitoring information will be for the nearest monitoring site to the chosen weather station site. The distance between the weather station and the closest CHAP monitoring site will be stated.
- Each chart visible may be printed, or downloaded as images in any of the formats; PNG image, JPEG image, PDF document, SVG vector. This can be done using the menu in the top right of the chart box.
- The zoom on the charts can be increased by dragging a cursor along and down on the chart itself to capture the desired scale and date as in example below.

Dragging cursor over following area will zoom in the chart as follows:

The zoom can be reset using the Reset zoom button.

Growth Stage
o Chart showing growth stage progression of winter wheat
o Chart showing observed date of full leaf emergence

Diseases
o Brown rust
    ▪ Table showing cultivar resistance of cultivars monitored for brown rust affecting wheat
    ▪ Chart showing brown rust disease severity by leaf layer
o Eyespot
    ▪ Table showing cultivar resistance of cultivars monitored for eyespot affecting wheat
    ▪ Chart showing percentage of stems affected at GS30 (ear at 1cm)
    ▪ Chart showing percentage of stems affected at GS75 (medium milk)
    ▪ Chart showing percentage of cases where eyespot has penetrated at least 1 leaf sheath at GS30 (ear at 1cm)
    ▪ Chart showing percentage of cases where eyespot has penetrated at least 1 leaf sheath at GS75 (medium milk)
o Fusarium
    ▪ Table showing results of fusarium leaf isolations from GS31.
    ▪ Table showing mycotoxins produced by Fusarium Ear Blight (FEB) pathogens
    ▪ Chart showing percentage stem base fusarium infection
o Powdery mildew
    ▪ Table showing cultivar resistance of cultivars monitored for powdery mildew affecting wheat

- Chart showing powdery mildew disease severity by leaf layer
  - o *Septoria tritici*
    - Table showing cultivar resistance of cultivars monitored for *Septoria tritici* affecting wheat
    - Chart showing *Septoria tritici* disease severity by leaf layer
  - o Yellow rust
    - Table showing cultivar resistance of cultivars monitored for yellow rust affecting wheat
    - Chart showing yellow rust disease severity by leaf layer

Pests
- o Aphids
  - Chart showing number of aphids caught in yellow water traps
  - Chart showing aphid incidence (on the stem and leaves) recorded during transects walked across the field (bird-cherry oat aphid and grain)
  - Chart showing aphid incidence (on the ear) recorded during transects walked across the field (grain aphid and rose grain aphid)
- o Orange wheat blossom midge
  - Chart showing number of midges per plant (and whether a cloud of midges is observed when parting the crop)
  - Chart showing number of midges caught on yellow sticky traps
- o Slugs
  - Chart showing number of slugs per trap

(iii) Oilseed rape

Risk prediction

Growth Stage
- Growth stage key for oilseed rape
- Chart showing predicted growth stage progression for oilseed rape (decimal key)
- Chart showing predicted growth stage progression for oilseed rape (BBCH key)

Growth stage predictions only will be available until July 2018

Diseases
- o Alternaria
  - Table showing infection risk. Shows risk based on observed weather for previous and current day, and forecast risk based on both observed and forecast weather.
  - Chart showing estimated number of infection events per day leading to visible symptoms.

- o Phoma
  - Table showing risk of 10% leaf spotting date having been reached.
  - Table showing risk of phoma affecting oilseed rape crops.

- o Sclerotinia
  - Table showing infection risk on sow date of 6 August, on sow date 20 August, on sow date 31 August, and on sow date 14 September. Shows risk based on observed

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weather for previous days and current day, and forecast risk based on both observed and forecast weather.

- o Aphids
  - Table showing the risk of an aphid treatment threshold having been exceeded at least once during the growing season.
- o Cabbage seed weevil
  - Table showing the risk of cabbage seed weevil treatment threshold having been exceeded at least once during the growing season, if sufficient monitoring information is available.
- o Cabbage stem flea beetle
  - Table showing the risk of an aphid treatment threshold having been exceeded at least once during the growing season.
- o Cabbage stem weevil
  - Table showing the risk of cabbage stem weevil treatment threshold being exceeded in March, if sufficient monitoring information is available.
- o Pollen beetle
  - Table showing risk of a pollen beetle treatment threshold having been exceeded at least once before flowering, if sufficient monitoring information is available.
- o Slugs
  - Table showing the risk of slug treatment threshold having been exceeded at least once during the growing season.

Real-time pest and disease monitoring

- Real-time pest/disease monitoring will be shown at the top of the main page body
- If the site is a CHAP monitoring site, the pest or disease monitoring will be for the site chosen.
- If the site is a weather station only, the pest or disease monitoring information will be for the nearest monitoring site to the chosen weather station site. The distance between the weather station and the closest CHAP monitoring site will be stated.
- Each chart visible may be printed, or downloaded as images in any of the formats; PNG image, JPEG image, PDF document, SVG vector. This can be done using the menu in the top right of the chart box.

Growth stage
  - A chart showing growth stage progression of oilseed rape (Decimal key)
  - A chart showing growth stage progression of oilseed rape (BBCH key)

Diseases
- o Alternaria
  - Chart showing percentage of plants with leaves affected by Alternaria (from emergence to end March)
  - Chart showing % pods affected by Alternaria (June/July)
- o Light leaf spot
  - Table showing cultivar resistance ratings of cultivars monitored, for light leaf spot affecting oilseed rape (all season)
  - Chart showing percentage of plants with leaves affected by light leaf spot (from emergence to end March)

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- Chart showing which stems/zones have actively sporulating lesions (from end April, early flowering)
- Chart showing severity of light leaf spot on stems (from June/July, pod ripening)
- Chart showing percentage pods affected by light leaf spot (from June/July, pod ripening)
- Phoma
  - Table showing cultivar resistance ratings of cultivars observed at monitoring site, for phoma affecting oilseed rape (from emergence to end March)
  - Chart showing percentage of plants with leaves affected by phoma types A and B (from emergence to end March)
  - Chart showing percentage of cases where phoma canker has penetrated the stem (from June/July, pod ripening)
  - Chart showing phoma stem canker severity (from June/July, pod ripening)
- Sclerotinia
  - Chart showing sclerotinia stem tor severity (from June/July, pod ripening)

Pests
- Aphids
  - Chart showing average number of aphids caught in yellow traps (from August through November)
  - Chart showing percentage of mealy cabbage aphid (from April through May)
- Cabbage seed weevil
  - Chart showing average number of adults per plant (from April)
- Cabbage stem flea beetle
  - Chart showing average number of cabbage stem flea beetles caught in yellow water traps
  - Chart showing average percent leaf area missing per plant due to cabbage stem flea beetle damage
  - Cabbage stem flea beetle plant dissection results
- Cabbage stem weevil
  - Chart showing average number of adults per plant (from April)
- Pollen beetle
  - Chart showing number of pollen beetles caught on a yellow sticky trap
  - Chart showing average number of adults per plant (from April)
  - Chart showing average number of larvae per plant (from April)
- Slugs
  - Average number of slugs per trap
- Turnip Sawfly
  - Average number of turnip sawflies caught in yellow water traps

(iv) Barley

Risk prediction

- This service is not currently available.

Real-time pest and disease monitoring

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- A chart showing growth stage progression will be displayed throughout the season for all pests/diseases.
- Real-time pest/disease monitoring will be shown at the top of the main page body
- If the site is a CHAP monitoring site, the pest or disease monitoring will be for the site chosen.
- If the site is a weather station only, the pest or disease monitoring information will be for the nearest monitoring site to the chosen weather station site. The distance between the weather station and the closest CHAP monitoring site will be stated.
- Each chart visible may be printed, or downloaded as images in any of the formats; PNG image, JPEG image, PDF document, SVG vector. This can be done using the menu in the top right of the chart box.

Diseases
- Brown rust
  - Table showing cultivar resistance of cultivars monitored for brown rust affecting barley
  - Chart showing brown rust disease severity by leaf layer
- Eyespot
  - Chart showing percentage of stems affected at GS30 (ear at 1cm)
  - Chart showing percentage of stems affected at GS75 (medium milk)
  - Chart showing percentage of cases where eyespot has penetrated at least 1 leaf sheath at GS30 (ear at 1cm)
  - Chart showing percentage of cases where eyespot has penetrated at least 1 leaf sheath at GS75 (medium milk)
- Net blotch
  - Table showing cultivar resistance of cultivars monitored for net blotch affecting barley
  - Chart showing net blotch disease severity by leaf layer
- Powdery mildew
  - Table showing cultivar resistance of cultivars monitored for powdery mildew affecting barley
  - Chart showing powdery mildew disease severity by leaf layer
- Ramularia
  - Table showing cultivar resistance of cultivars monitored for Ramularia affecting barley
  - Chart showing ramularia disease severity by leaf layer
- Rhynchosporium
  - Table showing cultivar resistance of cultivars monitored for rhynchosporium affecting barley
  - Chart showing rhynchosporium disease severity by leaf layer

Pests
- Aphids
  - Chart showing number of aphids caught in yellow water traps
  - Chart showing aphid incidence (on the stem and leaves) recorded during transects walked across the field (bird-cherry oat aphid and grain)
  - Chart showing aphid incidence (on the ear) recorded during transects walked across the field (grain aphid and rose grain aphid)
- Slugs
  - Chart showing number of slugs per trap

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(v) Potato

<u>Risk predictions</u>

Diseases
- ○ Late Blight
  - ▪ Local risk estimates based on previous 2 days weather (Smith periods) for the last 14 days
  - ▪ Local risk estimates based on previous 10 days weather (BLEWS model) for the last 14 days

<u>Real-time pest and disease monitoring</u>

- • Real-time pest/disease monitoring will be shown for all sites, and will display output from the CropMonitor potato scout network.

3.   Summary reports

- • The left-hand menu allows users to toggle between crop reports.
- • The reports are automatically generated, usually overnight, from the most current monitoring data to provide a real-time summary of pest and disease prevalence and growth stage progression.

4.   Spring beans

- • Provides background information on forecast for downy mildew of spring beans .
- • Map showing the regional risk areas
- • Table showing the latest forecast risk for each region, and the date on which the forecast was generated. The forecasts are automatically and dynamically generated from weather data collected.

5.   Surveys of commercially grown crops

a) Oilseed survey

- • Provides background information on the survey of commercially grown winter oilseed rape.
- • Provides link to previous season and latest reports from surveys.

b) Wheat survey

- • Provides background information on the survey of commercially grown winter wheat.
- • Provides link to previous season and latest reports from surveys.

6.   Other site information

All site pages have the same header and footer, which as well as links to pages described above, include links to:

- View Terms and Conditions, including our use of cookies
- Link to email the CropMonitor™ team
- Link to view Twitter CropMonitor™ feed

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