



Harvest Fire Danger Index

Agbyte in conjunction with a range of local community groups runs various harvest Fire Danger Index (FDI) alerting systems. These systems utilise data generated by Agbyte weather stations that are either individually owned by primary producers or by community groups.

FDI is crucial for adhering to the harvest code of practice that advises paddock harvesting operations to cease when the FDI reaches 35. The FDI is calculated using the McArthur Index version 4.

The harvest FDI alerting system typically utilises the FDI data generated at each site across the region and displays this on a web page where a trusted community member/s then make a decision on sending out an informative SMS to growers and stakeholders. By displaying the FDI from multiple sites, the users can get a feel for how FDI varies across a region (often driven by wind speed) and thus make sound decisions about alerting those affected by a rising FDI value.

The harvest FDI alerting system used on the Northern Yorke Peninsula, in place since 2015, accesses FDI data from 25 weather station sites managed by Agbyte. On high risk days, a SMS is sent out (via a broadcast SMS provider) that states *"The average FDI is near to or has exceeded 35. Please review your paddock conditions"*. This aims to inform users of general conditions, yet place the onus on those harvesting to check conditions in the paddock where they are working in order to get local information relevant to them.

Agbyte weather stations have high quality sensors that are mounted at standard heights which include:

- Air temperature and relative humidity at 1.2m from ground level
- Wind speed & direction sensors at 2.0m from ground level

Agbyte weather stations are located away tree lines or other buildings that may affect wind and they are typically installed on more prone areas rather than in hollows or swales that may restrict wind.

Once the weather station has recorded the readings from the sensors, they are set to upload the data every 15 minutes to a gateway server. Calculation are performed at the server level to generate a FDI figure utilising $10^{(0.009254 - (0.004096*((100-w)^{1.536})) + (0.01201*x) + (0.2789*(\text{SQRT}(z)) - 0.09577*(\text{SQRT}(y))))}$

X = air temperature

Y = relative humidity

Z = 10m wind speed

W = curing factor = 1 (indicating fields are at 100% cured for harvest)

To convert the 2m wind speed reading to its equivalent at 10m:

Wind speed 10m = $x*((5)^{0.143})$

X = Wind speed 2m

Wind speed is converted from 2m to 10m in accordance with CSIRO McArthur Index and should be taken into account when doing manual reads with a handheld Kestrel weather meter. Also when using such meters, a wind speed reading should be taken for at least 3 minutes in order to gauge an average, preferably 10 minutes.

It can be useful to cross check FDI readings by downloading the *Calc FDI* app by Fairport on your smart phone

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