

Weather Impact

Agricultural applications using ECMWF ensemble forecasts in Africa

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Weather information needed for:

- Planning
- Preventing weather-induced damage

Weather information should be:

- Easy to understand
- Localised



Our mission is:

- to deliver **high-quality** weather and climate services;
- to **optimize** global food productivity and quality;
- to **reduce** the impact of climate change.

What we do

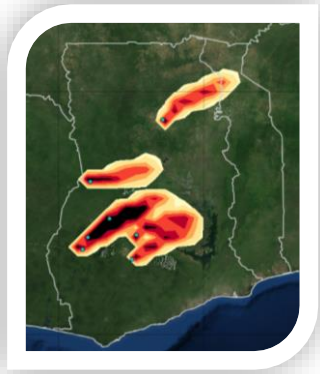
- Weather and climate services
- Combination of weather models, satellite and ground observations

Weather Impact



Where we are active

Weather Impact



In **Ghana** we forecast where to expect future fall armyworm outbreaks



Our AgriCloud mobile app provides real-time, localized plant and spray advice for **Southern Africa**



>150,000 **Kenyan, Ethiopian and Tanzanian** farmers receive our weather forecasts via mobile text messaging

66 villages in **Burundi** register their local rain measurements on their community tablet





Challenge:
Translating **complex** weather data to
useful information

GAP4All

- Burundi
- 66 groups of 50 farmers
- ECMWF
- Daily weather forecast
- Rain gauges








From ensemble to symbol

Weather **Impact**

1. Define rainfall classes

- Fixed or space/time dependent

				
No rain	Light rain	Moderate rain	Heavy rain	Very heavy rain
0-2 mm	2-8 mm	8-20 mm	20-30 mm	30+ mm

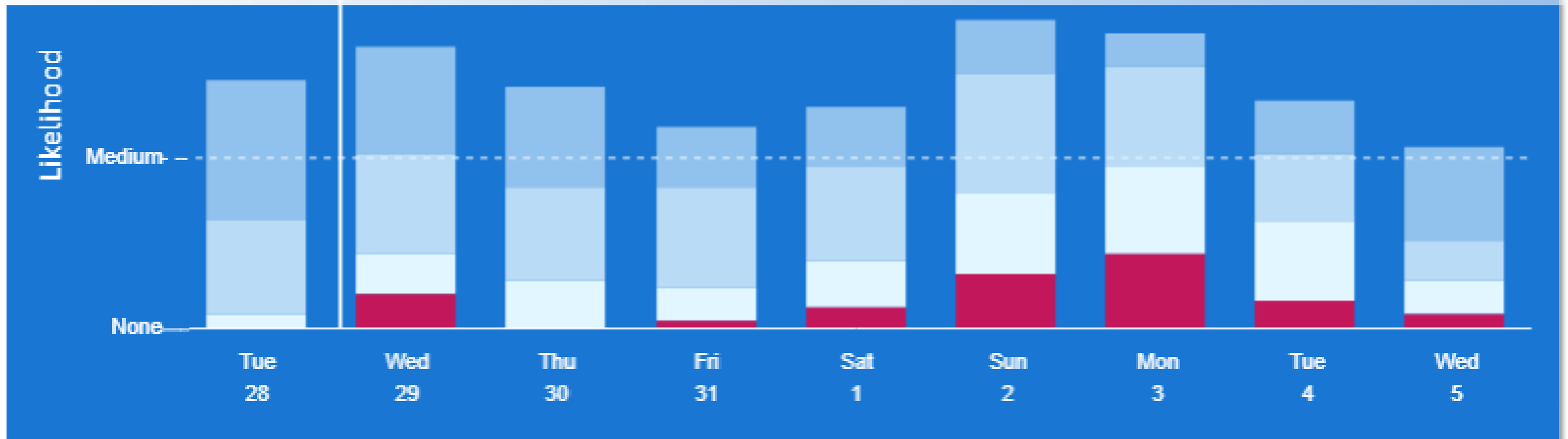
From ensemble to symbol

Weather **Impact**

2. Choose symbol based on ensemble precipitation forecast

Approach #1:

Symbol selected based on ensemble precipitation forecast



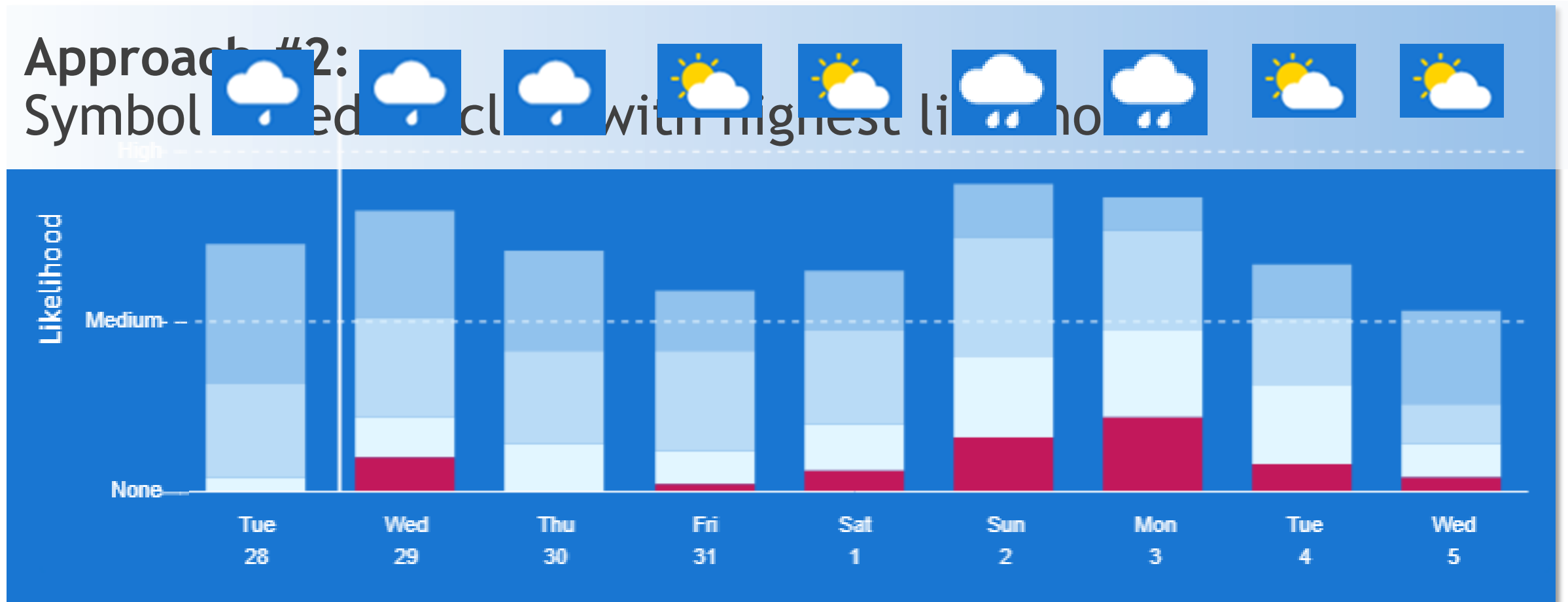
From ensemble to symbol

Weather **Impact**

2. Choose symbol based on ensemble precipitation forecast

Approach #2:

Symbol selected with highest likelihood

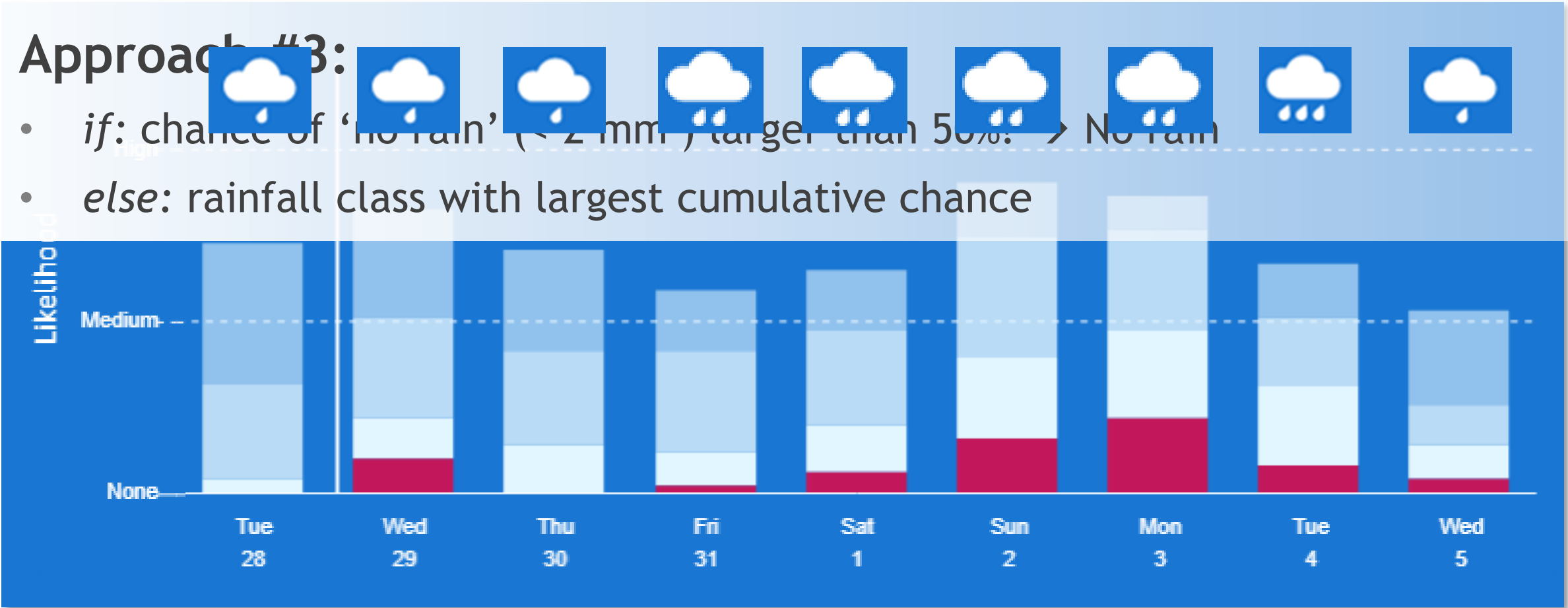


From ensemble to symbol

2. Choose symbol based on ensemble precipitation forecast

Approach #3:

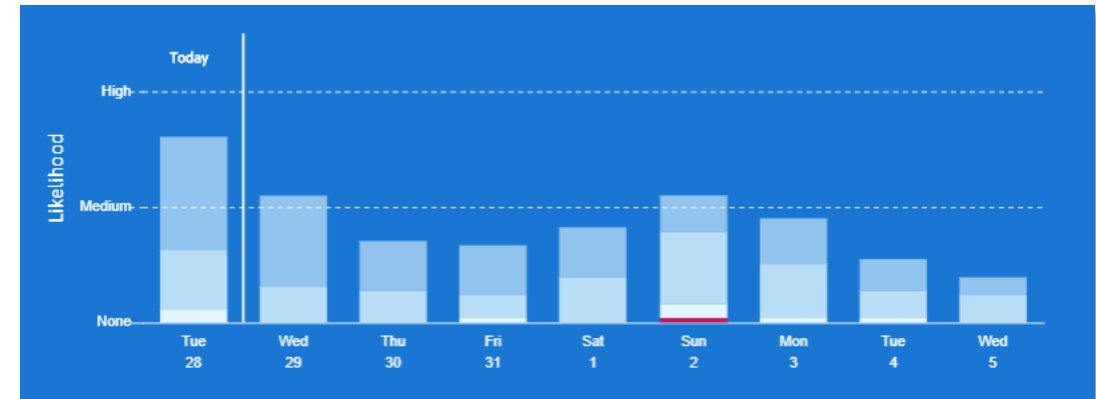
- *if*: chance of 'no rain' ($< 2\text{ mm}$) larger than 50%: \rightarrow No rain
- *else*: rainfall class with largest cumulative chance








From ensemble to text message

Weather **Impact**

- More details and nuance
- Decisions for defining:
 - Classes of likelihood (low, medium, high chance)
 - Rainfall thresholds



Tuesday 05/28		Today, there is high chance of rain (2-9 mm). This morning it will be 13 C and during the day a maximum of 20 C will be reached.
Wednesday 05/29		Tomorrow, there is medium chance of rain (1-6 mm). Temperatures will range from 13-20 C.
Thursday 05/30		
Friday 05/31		There is medium chance of rain (1-15 mm). Temperatures similar to today (13-21 C).
Saturday 06/01		

Conclusion

- Many opportunities for ensemble forecasts in the agricultural sector
- Different ways to ‘translate’ ensemble forecasts
- Level of detail vs understandability
- Weather information improves the livelihood of farmers

A close-up photograph of a person's hand reaching into a field of golden wheat. The hand is positioned in the center, with fingers slightly curled as if touching or holding a stalk. The wheat is in sharp focus in the foreground, with many stalks visible. The background is a soft, out-of-focus expanse of more wheat and a warm, hazy sky. The overall color palette is dominated by warm tones of gold, brown, and blue.

Weather Impact

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