

The MED-Amin crop monitoring exercise

A review of the 2020-2021 cereal campaign

Giacinto Manfron



*MED-Amin 8° network meeting
23 November 2021*

Contents

- **Objective** of the monitoring exercise
- **Principles & workflow**
- Monitoring **methodology**
- 2020-2021 monitoring **results**
- Med-Amin future **perspectives**

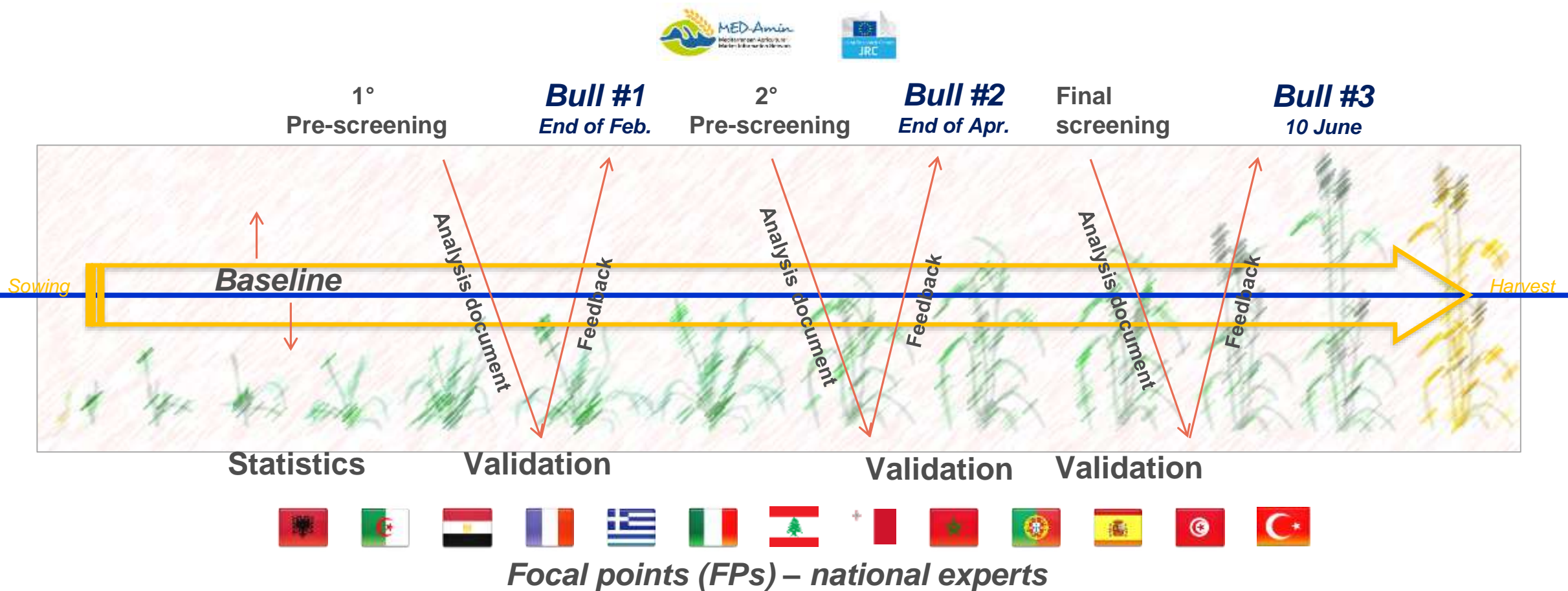


Aim

- Run a **crop monitoring** for wheat and barley for the AED-Amin area **for the 2020-2021 cereal campaign**
- **Identify and disseminate early warnings** on crop productivity
- Perform qualitative **analysis at sub-national level**



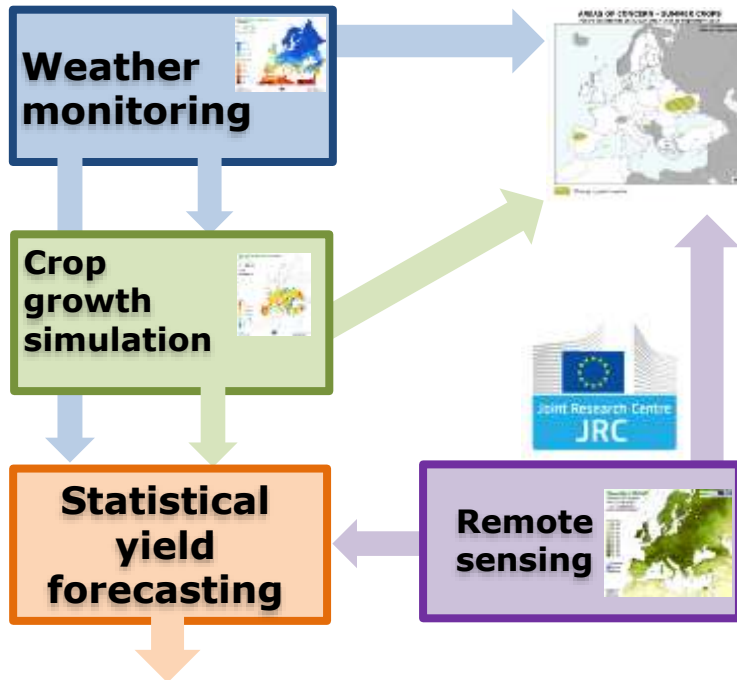
Principles & workflow



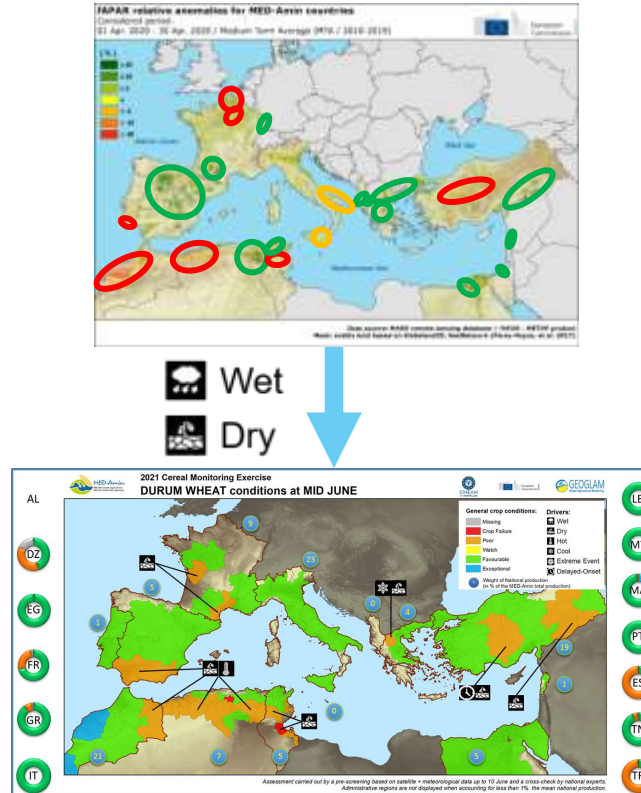
Participative | Multisource | Pivot | Leverage

Methods

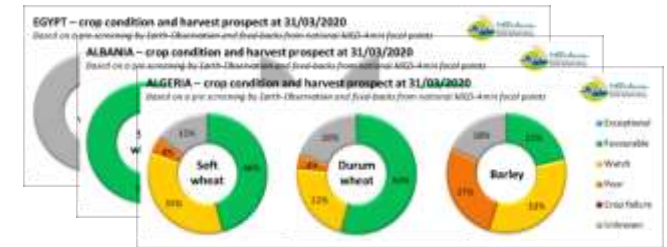
(1) Hot spot identification



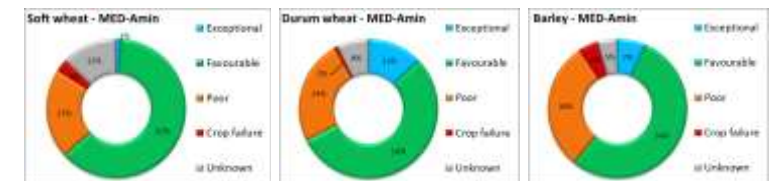
(2) Information discretization



(3) Information aggregation



From country level...
...To the Mediterranean area



Quantitative yield forecast

<https://ec.europa.eu/jrc/en/mars/bulletins>

Results: baseline data collection

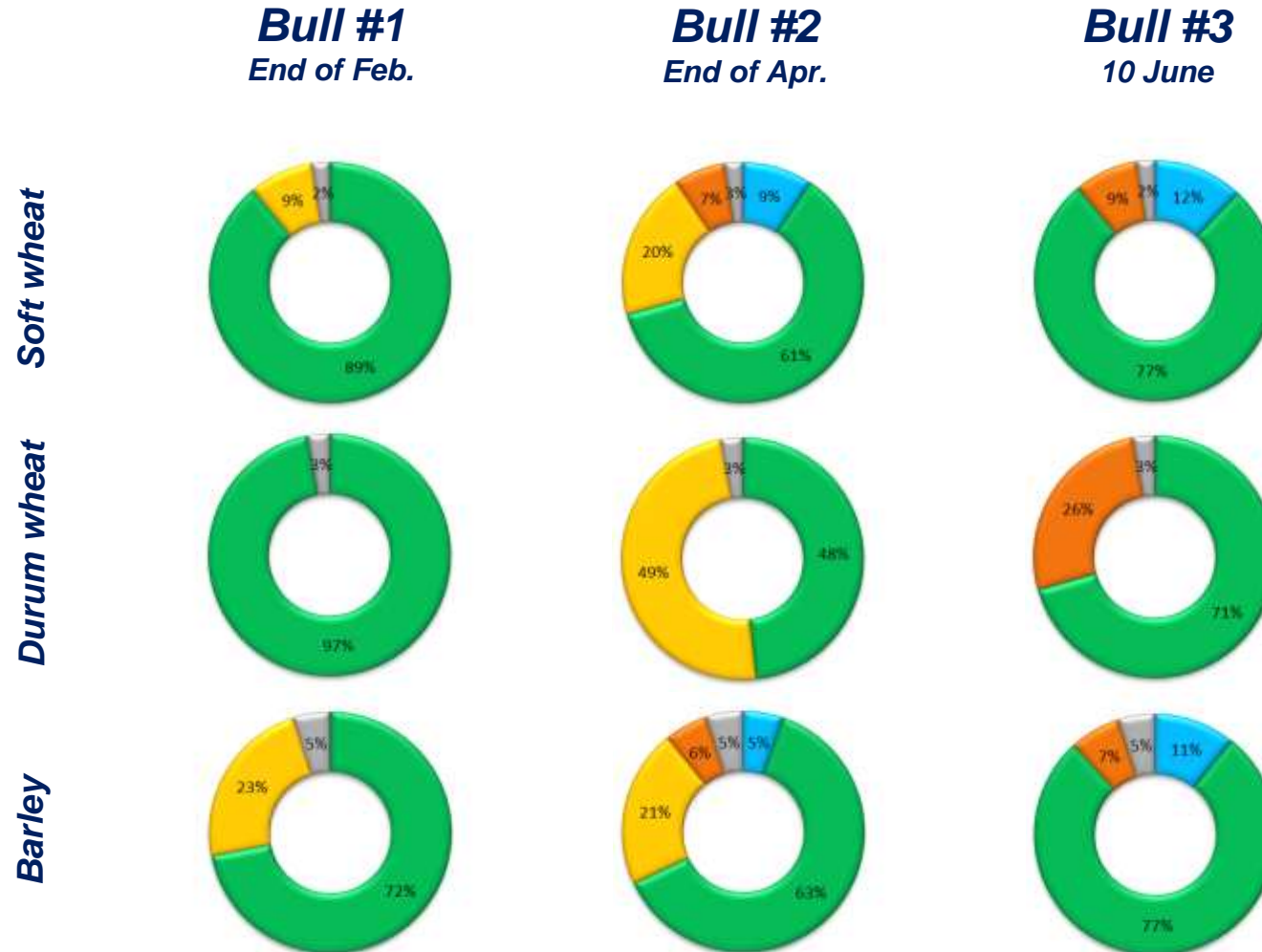
- Winter wheat, soft wheat and barley
- From 2015 (before) to 2020
- Almost 200 regions from 13 mediterranean countries
- Area, Yield, Production

Great importance for:

- Aggregate crop conditions judgments from regional to national scale, by means of (productions) weighted averages
- Identify the regions in charge of at least 90% the national crop production



Results: regional productivity expectations (1/3)



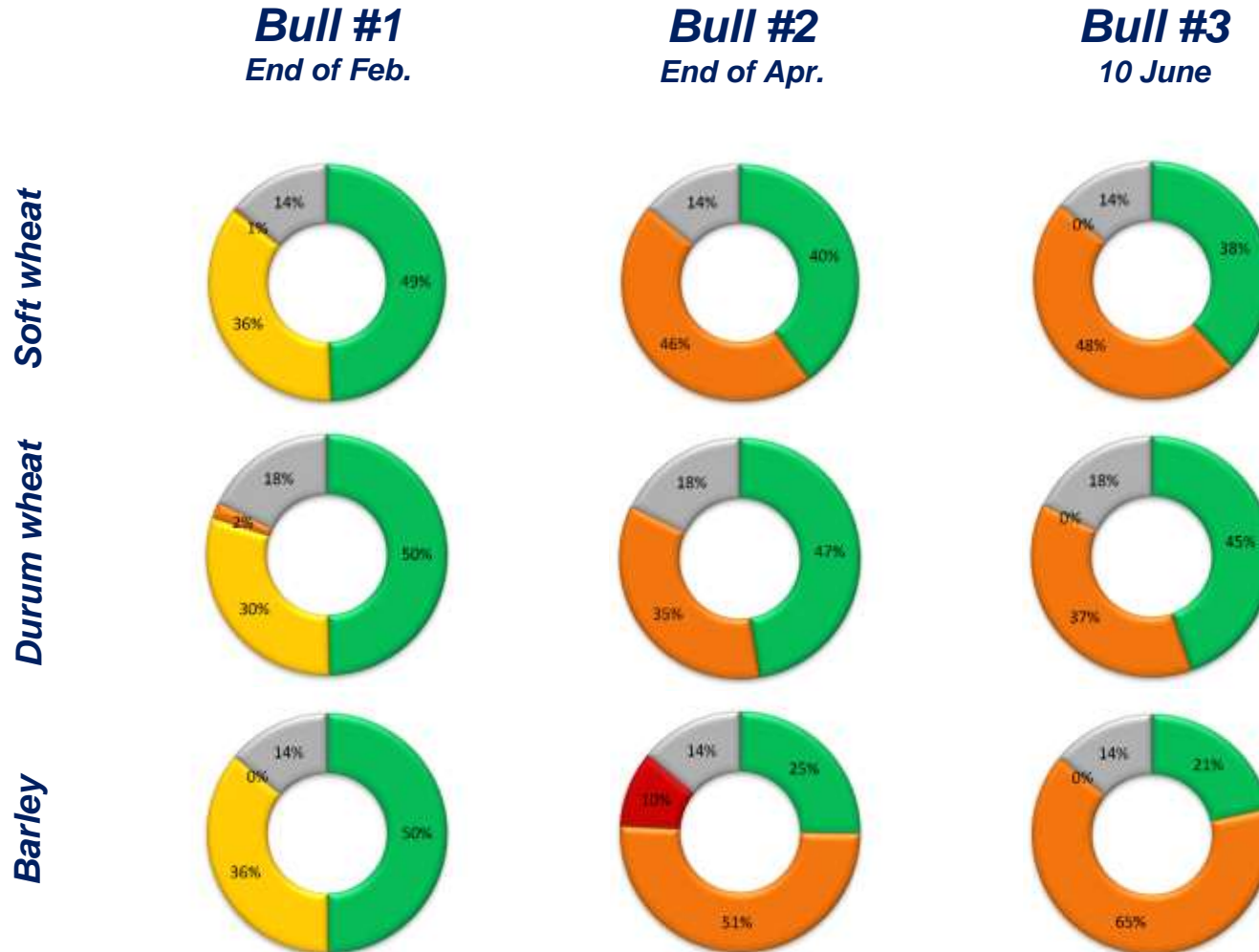
- Exceptional
- Favourable
- Watch
- Poor
- Crop failure
- Unknown

MARS4CAST - Prod. Est. July 2021			
Country	Crop	%21/5yrs	%21/20
FR	Soft wheat	8.8	25
FR	Durum wheat	-12	16
FR	Barley	15	-3

area 1,000 ha		France	
yield 100 kg/ha			
production 1,000 t		2020	2021
SOFT WHEAT			
area	4,262	4,945	
yield	68.5	71.0	
production	29,195	35,110	
DURUM WHEAT			
area	252	288	
yield	51.9	55.2	
production	1,308	1,590	
BARLEY			
area	1,972	1,727	
yield	52.8	67.7	
production	10,412	11,682	

Source:
Coceral crop estimates for EU countries – Sept. 2021

Results: regional productivity expectations (2/3)



- Exceptional
- Favourable
- Watch
- Poor
- Crop failure
- Unknown

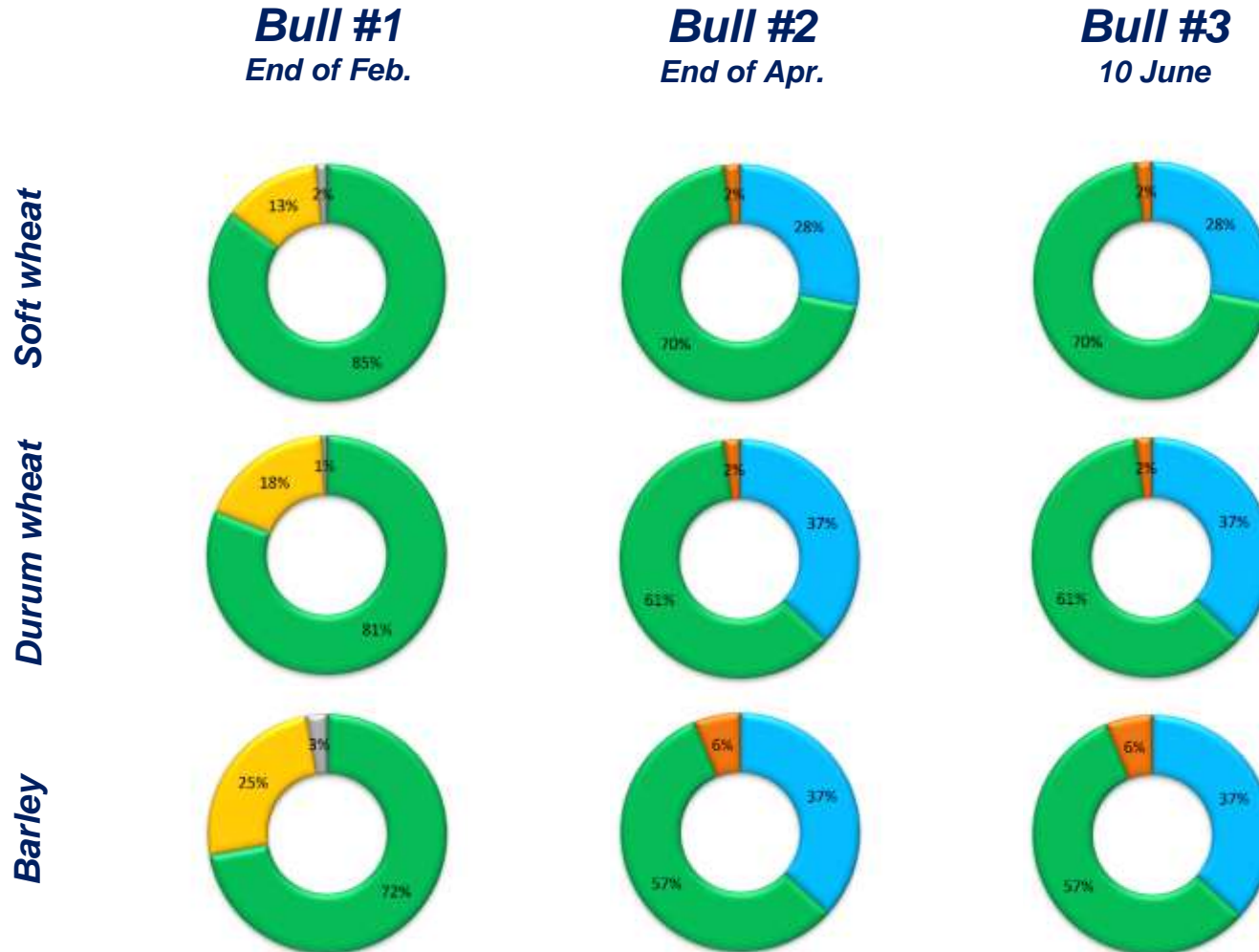
Algeria

Cereal Production

	2016-2020 average	2020	2021 estimate	change 2021/2020
	000 tonnes			percent
Wheat	3 323	3 800	2 500	-34.2
Barley	1 509	1 700	900	-47.1
Oats	79	70	76	8.6
Others	7	6	6	0.0
Total	4 919	5 576	3 482	-37.6

Note: percentage change calculated from unrounded data.
Source: FAO/GIEWS Country Cereal Balance Sheet.

Results: regional productivity expectations (3/3)

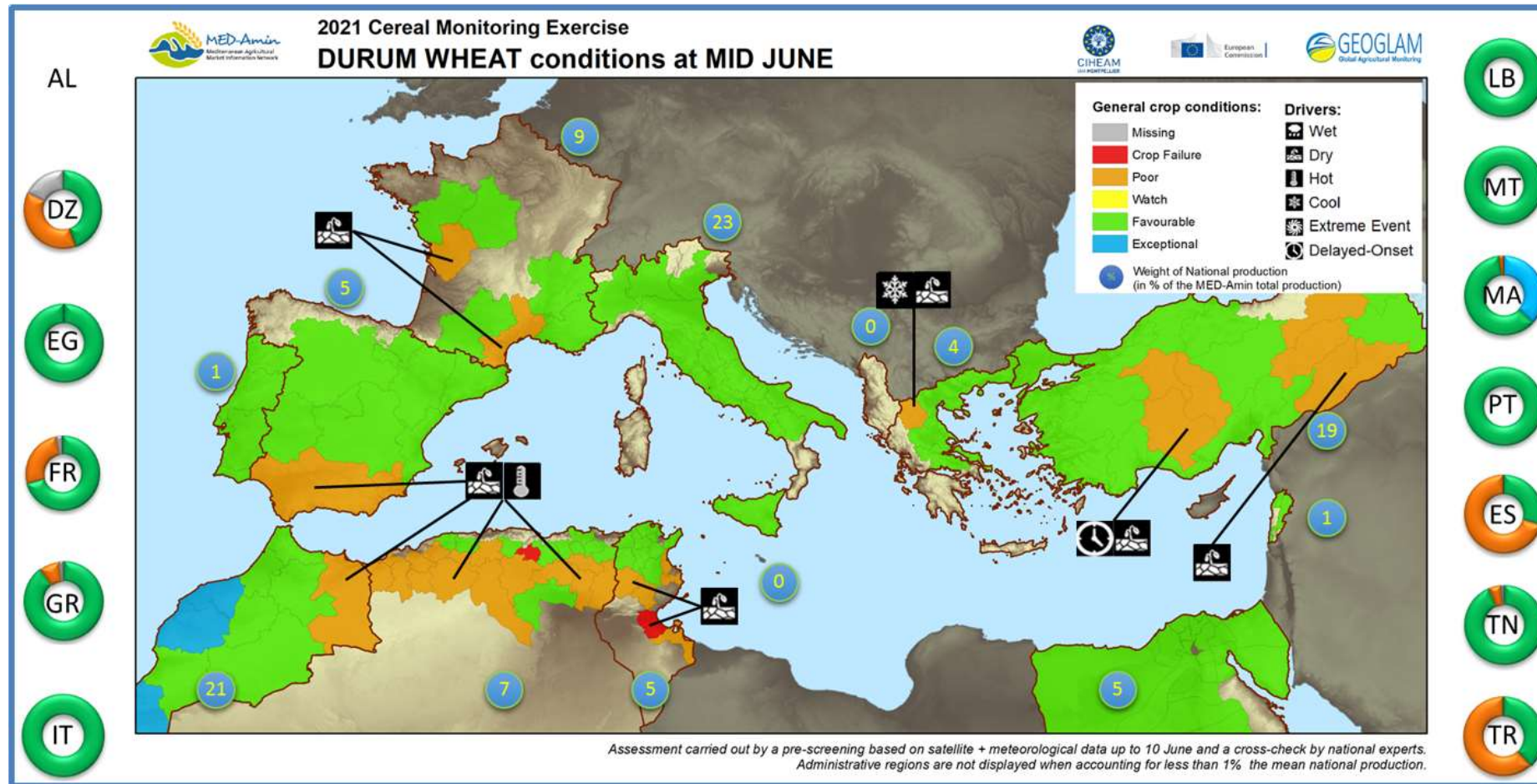


- Exceptional
- Favourable
- Watch
- Poor
- Crop failure
- Unknown

Morocco				
Cereal Production				
	2016-2020 average	2020	2021 estimate	change 2021/2020
	000 tonnes			percent
Wheat	4 765	2 560	7 160	179.7
Barley	1 548	640	2 600	306.3
Maize	92	50	100	100.0
Others	99	105	103	-1.9
Total	6 504	3 355	9 963	197.0

Note: percentage change calculated from unrounded data.
Source: FAO/GIEWS Country Cereal Balance Sheet.

Results: Med-Amin area productivity expectations



Results: Med-Amin area productivity expectations

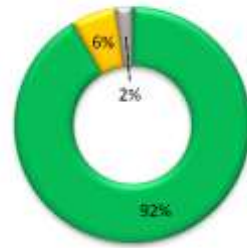


Soft wheat

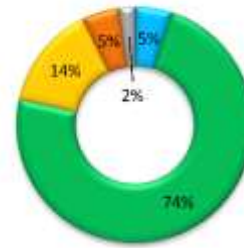
Durum wheat

Barley

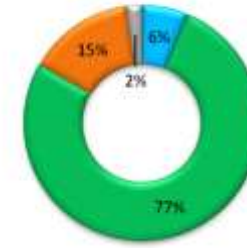
Bull #1
End of Feb.



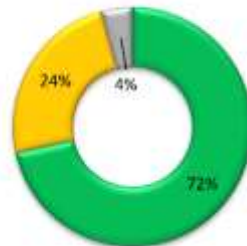
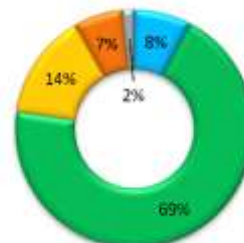
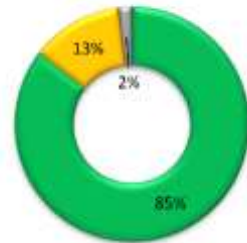
Bull #2
End of Apr.



Bull #3
10 June

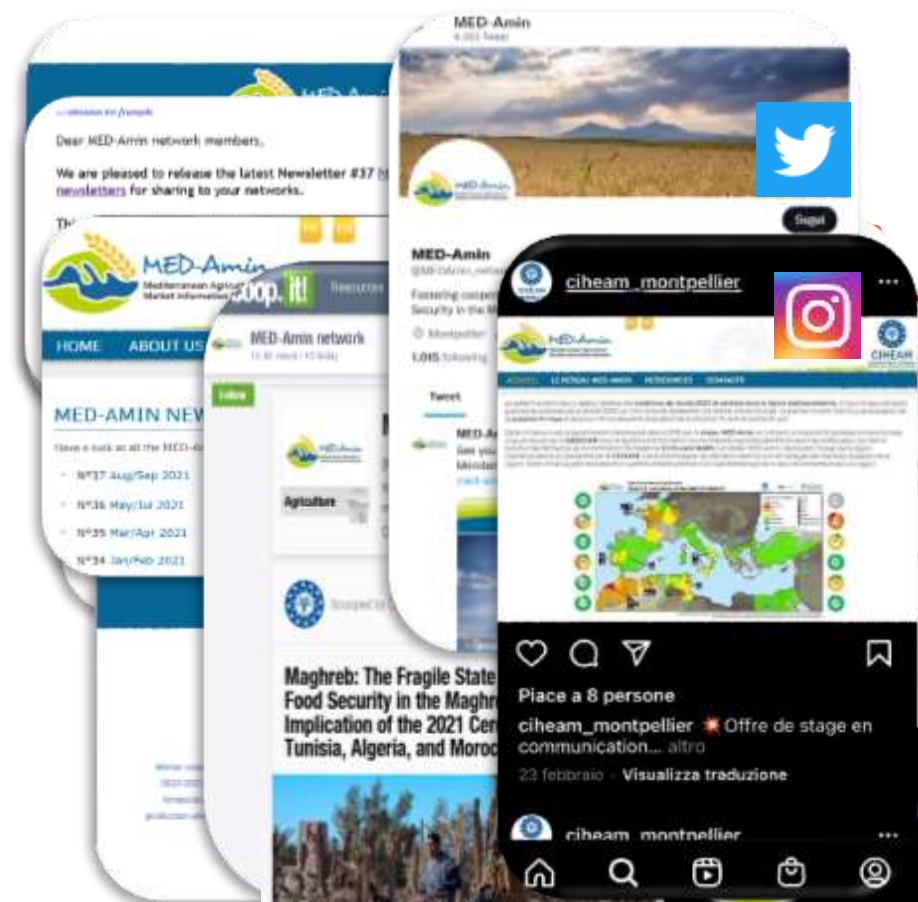


- Exceptional
- Favourable
- Watch
- Poor
- Crop failure
- Unknown



Dissemination of the results

- Three seasonal **outlooks**
- MED-Amin **mailing list**
- **Social media**
- MED-Amin **newsfeed**



European
Commission

Conclusion

- All the monitoring **deliverables were met** despite the difficulties due to the pandemic condition
- **Crop productivity hot spot identified** and **shared as early warnings** within partners and publicly
- Increased **partner engagement**:
 - > quality feedbacks (complete answers: comprehensive, on-time, detailed)
 - Improved flux of shared info



2022 crop monitoring exercise, what's next?

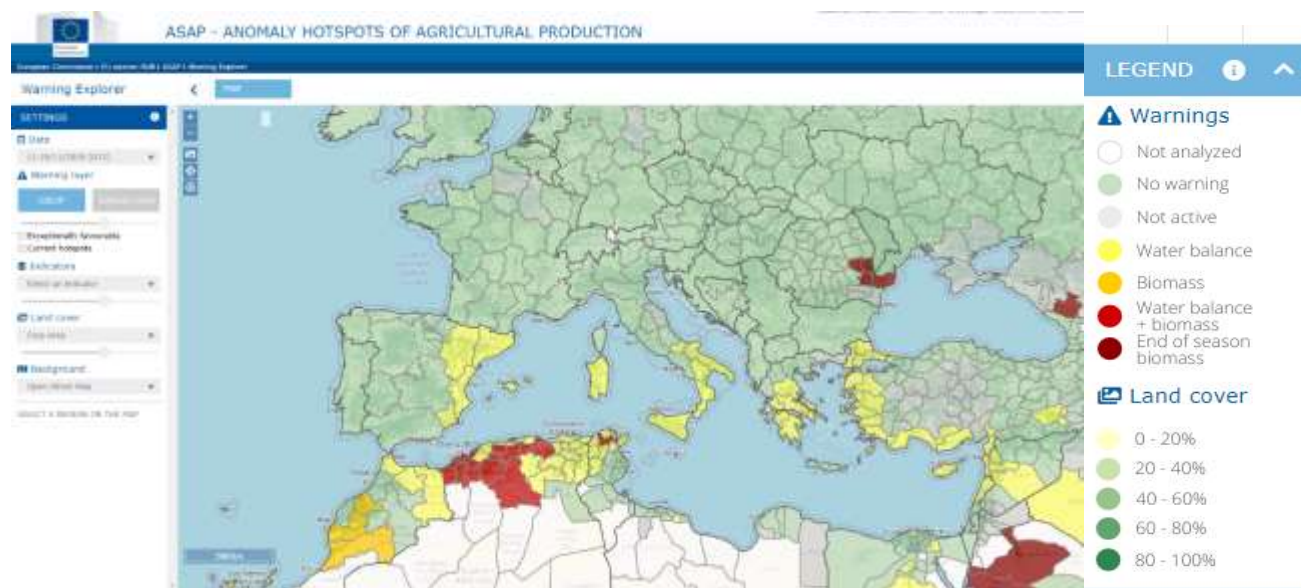
proposed discussion points

- **MED-Amin crop inventory:** mapping the main **cultivar**, **agro-practices** and **irrigated arable land** of the MED-Amin area
- how to tackle the issue of **grains quality** of the future harvest?
- What about the possibility to **shift** the first outlook **according to** country **crop calendars**?
- How to progress towards a **warning explorer** for agriculture analysis and to **regional yield forecasting**?



2022 crop monitoring exercise, what's next?

The JRC Anomaly hot Spot for Agriculture Production (ASAP) team



SPECIAL FOCUS¹ – May 2021

Poor yield outlook for winter cereals in Algeria

The winter cereal season is ongoing in Algeria and has been marked by above-average temperatures (Figure 1) and a large rainfall deficit (Figure 2). At the end of April, the dominant red pattern in Figure 3 indicates that crops and rangelands have not received sufficient rainfall to fulfil their water requirements. The combined effects of poor rainfall and above-average temperatures negatively impacted crops and rangelands in the western and central parts of the country. The hot and dry conditions had a negative impact for cereals during flowering and grain-filling, particularly by accelerating the grain filling on the expense of biomass accumulation. This is reflected by the cumulative Normalised Difference Vegetation Index (NDVI) anomaly map (Figure 4), where this biomass proxy shows negative anomalies in various provinces. In contrast, crop conditions appear generally better in the northeast. As a result of the persistent dry conditions that hampered crop growth in central and western provinces, there is a prospect of below-average national yield and production of winter cereals and low vegetation and water availability in pastoral areas.

According to the [JRC MARS bulletin](#) of April, yield for wheat and barley at the national level is forecasted 20% and 15%, respectively, below the 5-year average. The MARS bulletin for May with updated national yield forecasts will be released on 25 May, and most likely will be corrected downwards based on the latest information on rainfall and vegetation conditions.



Figure 1. Difference of cumulative mean air temperature with historical average for March (left) and April (right) in °C.

INFO BOX 1 - WATER SATISFACTION INDEX

The Water Satisfaction Index (WSI) is an indicator of crop (or rangeland) performances. It expresses requirements have been met and thus indicates possible water deficit. The index is calculated by comparing the crop (or rangeland) water requirements with the available water.

Yield forecasting with machine learning and small data: what gains for grains?

Michele Meroni¹, François Waldner¹, Lorenzo Segnini², Hervé Kardes¹, Felix Renzold²

¹ European Commission, Joint Research Centre (JRC), Via E. Fermi 2749, I-21027 Ispra (VA), Italy.

<https://mars.jrc.ec.europa.eu/asap>



Thank you

Any questions?

giacinto.manfron@ec.europa.eu



© European Union 2021

Unless otherwise noted the reuse of this presentation is authorised under the [CC BY 4.0](https://creativecommons.org/licenses/by/4.0/) license. For any use or reproduction of elements that are not owned by the EU, permission may need to be sought directly from the respective right holders.

