

**RESEARCH QUESTION:**

*To guarantee the security of our supply, we would like to know the most likely climate scenario at 2050 and how this would affect durum wheat in Emilia Romagna (Italy)*

[https://www.voyagesphotosmanu.com/cartina\\_emilia\\_romagna.html](https://www.voyagesphotosmanu.com/cartina_emilia_romagna.html)

- Durum wheat data, 2019/20:
- Italy is the greatest durum wheat producer in the world along with Canada.
- Main numbers: 4 mt production, in 1.2 mha cultivated area, national consumption 5.5 mt.
- Emilia Romagna cultivated area 60.000 ha, 300.000t production.
- Links for durum wheat data in Italy: [ISTAT](#) , [ISMEA](#)

- Durum wheat purchased in Emilia Romagna from Barilla:

*360.000 t in 3 years from 2019 through supply chain contracts with farmer organisations in ER, equivalent to 20.000 ha in ER*

<https://www.regione.emilia-romagna.it/notizie/2019/dicembre/agricoltura-grano-duro-di-alta-qualita-dell-emilia-romagna-si-rinnova-l-accordo-tra-barilla-e-cerealicoltori>

[https://www.barillagroup.com/sites/default/files/BarillaReportSustainability2019\\_ENG\\_1.pdf](https://www.barillagroup.com/sites/default/files/BarillaReportSustainability2019_ENG_1.pdf) from Page 105

- Emilia Romagna maps

<https://geoportale.regione.emilia-romagna.it/catalogo/dati-cartografici/informazioni-geoscientifiche/suoli>

- Land use maps (durum wheat is in the category 'seminativi non irrigui/irrigui semplici')

<https://servizimoka.regione.emilia-romagna.it/mokaApp/apps/UDSD/index.html>

- Climatic tables

[https://www.arpae.it/dettaglio\\_generale.asp?id=4143&idlivello=1591](https://www.arpae.it/dettaglio_generale.asp?id=4143&idlivello=1591)

- Orography through google earth or DTM Emilia Romagna also available in wms (GIS)

[http://servizigis.regione.emilia-romagna.it/wms/sfumo\\_altimetrico5x5](http://servizigis.regione.emilia-romagna.it/wms/sfumo_altimetrico5x5)

- [Durum wheat Phenological curve in Piacenza](#) (along with phenological phase names), Emilia Romagna region (Italy), 2018-19, as example

- Articles on [phenological models, from literature](#):

1. "A generalized phenological model for durum wheat: application to the Italian peninsula", useful tools to build phenology
2. "New multi-model approach gives good estimations of wheat yield under semi-arid climate in Morocco" as further solution. In the appendix, parameters to build phenological phases
3. "Reference manual - AquaCrop" , from page 39 to 42