

# EO services contributing to SDGs

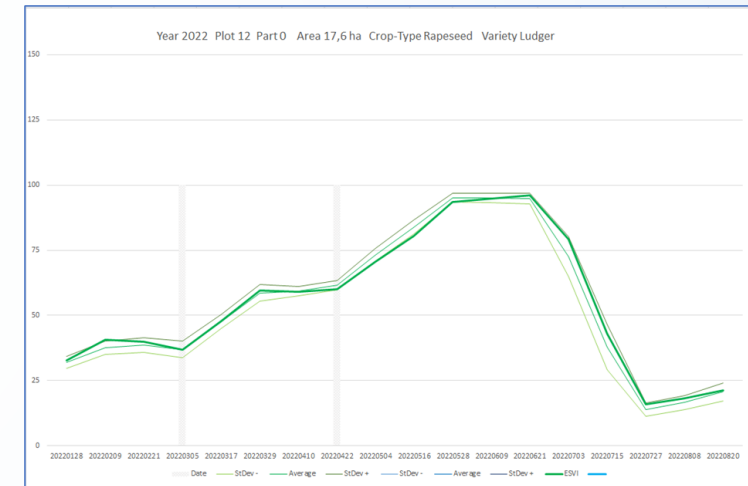
## Yield prediction based on Sentinel-1 SAR data



- User: National authorities / NGOs / Traders / Farmers
- Needs: Continuous data processing of Sentinel-1 SAR data.
- Challenge: Predict yield at an early stage of the season.
- Initiative: ESVI (enhanced SAR Vegetation Index) can be seen as proxy for fresh biomass and LAI (Leaf Area Index). It can be directly transformed into a yield prediction.
- Results: Over all plots of one farm very accurate results per crop-type over 5 succeeding seasons.
- Service Provider: cropix

Target 2.3: By 2030, double the agricultural productivity and incomes of small-scale food producers, in particular women, indigenous peoples, family farmers, pastoralists and fishers, including through secure and equal access to land, other productive resources and inputs, knowledge, financial services, markets and opportunities for value addition and non-farm employment.

The upper table shows the result over a period of five years for all plots and varieties. The figure shows the deviation of the predicted yield from the measured yield. A value of 102 means, that the measured yield was overestimated by 2%. Yield prediction can be done with high reliability from early May to mid of June.



ESVI growth curve of a rapeseed plot in Germany.

The lower table shows the standard deviation. It indicates, that yield prediction between early and mid May, for each single crop and over all crop-types deviates from the real yield in 2 from 3 years by less than 10 %. Only in 1 from 20 years it can be expected, that the predicted yield deviates by more than 20% from the measured yield.

	Mid April	End April	Early May	Mid May	End May	Early June	Mid June	End June	Mid June	End June
All crops	96	99	100	101	102	101	103	102	102	92
Rapeseed	101	95	97	100	105	105	108	105	99	92
Wheat	96	103	105	107	107	103	102	101	103	89
Barley	90	96	96	97	96	97	99	100	104	97

Standard Deviation	Mid April	End April	Early May	Mid May	End May	Early June	Mid June	End June	Mid June	End June
All crops	9,8	10,6	8,9	10,0	12,1	15,5	15,5	11,3	9,3	14,4
Rapeseed	8,8	4,5	5,7	9,8	11,3	9,1	9,2	6,8	9,2	14,0
Wheat	8,2	9,1	9,4	9,0	11,7	14,7	15,0	14,2	10,7	16,1
Barley	10,3	14,9	9,6	6,5	9,5	21,2	20,7	12,0	7,4	12,8