

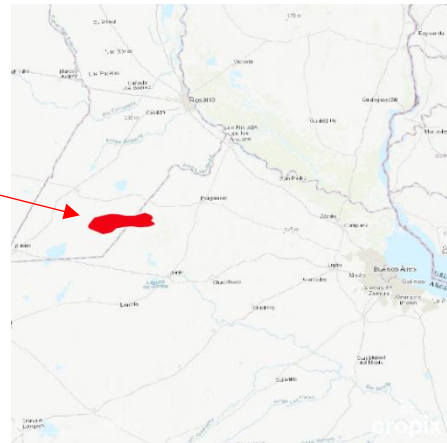
Severe hailstorm near Villa Cañas in Santa Fé province, Argentina.

On Dec 14, 2021 a severe hailstorm damaged an area of about 100.000 ha in the south of Villa Cañas.

The red area indicates the footprint of the event.

The wind, with gusts of up to 70 kilometers per hour and hail, which in some areas spread for 15 minutes, damaged crops, especially cornfields with good growth.

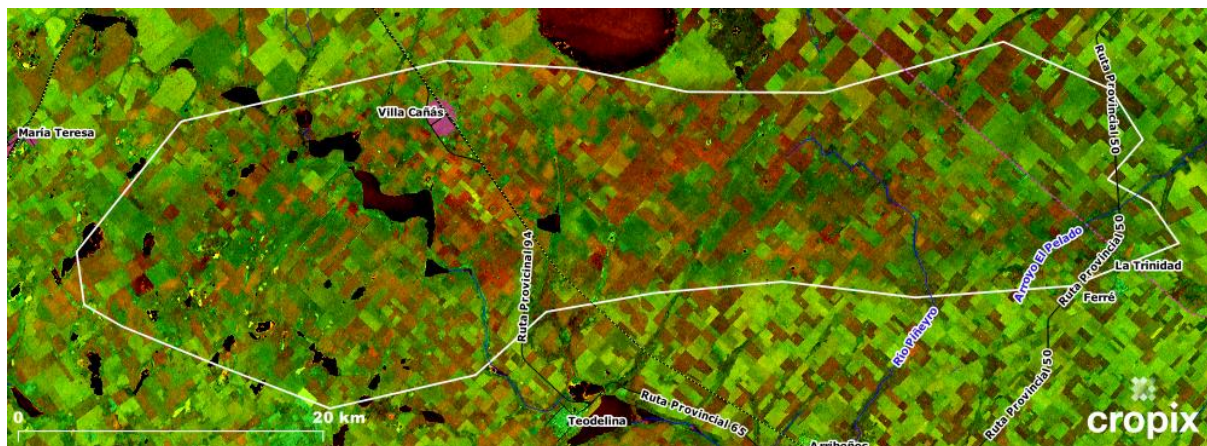
The rain, although it had not exceeded 25 millimeters by mid-afternoon, caused some flooding of rural roads.



The following image is a Color Composite from Sentinel-1 SAR data which was acquired on Dec 7, 2021. This was 7 days before the hailstorm.



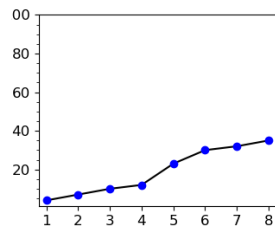
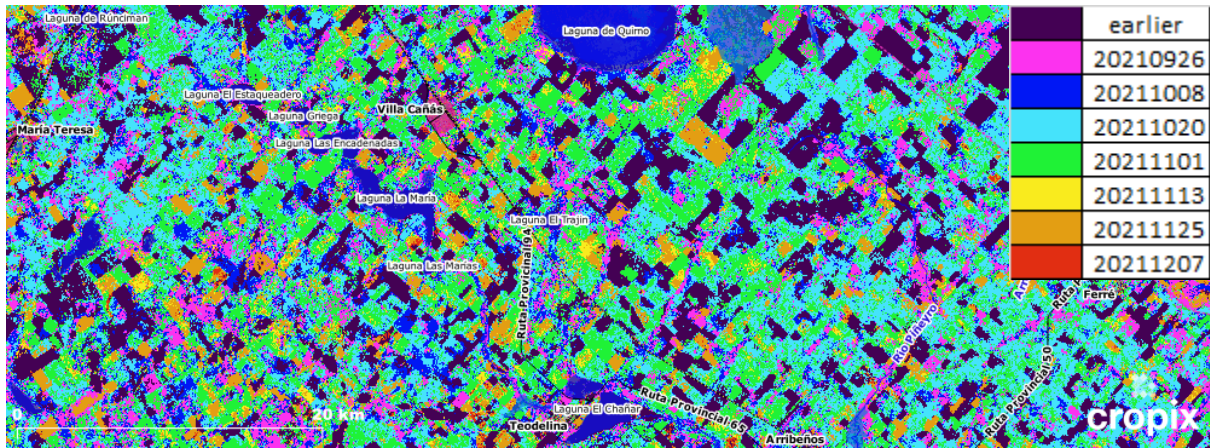
The image below is the succeeding dataset from Dec 19, 2021. It indicates the footprint of the hailstorm, which is highlighted with a white polygon.



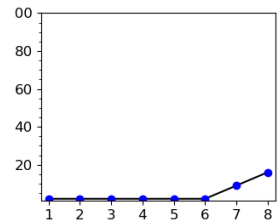
We see a change in the representation of the cropland caused by the hailstorm. We see as well, that the crops are in different phenological stages, when the hailstorm passed by.

Some of the plots are grown-up and had high biomass values like corn and sunflower, others were recently planted like soybeans and some were already in maturity phase like wheat. Therefore the hail had a different impact on the crops concerning the loss of biomass, depending on the actual phenological stage.

The image below shows the start of season for the different plots.

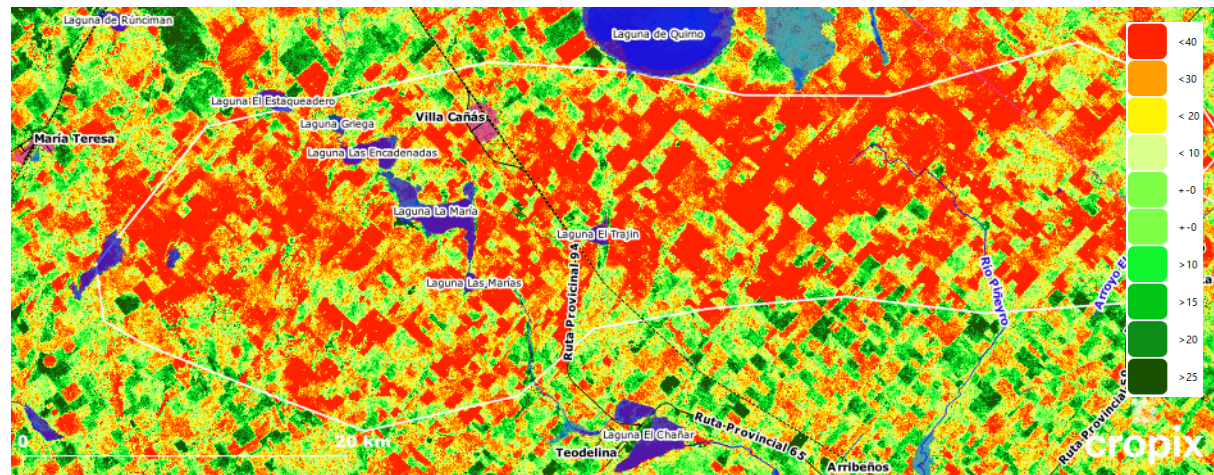


The first class (dark blue) shows plots, which were planted before Sep, 26 2021. Pink colored plots were planted between Sep 26, and Oct 8, 2021. The graph on the left shows in ESVI units the development of such a plot. On the right you see a plot that appears in yellow.



Mid of December it is summer in Argentina. The temperatures are high and there were some rains. The crops are growing fast. Between the two acquisitions (12 days), when the hail occurred and biomass was damaged, there was in parallel some growth of biomass.

With other words, we have a change of biomass in opposite direction. The image below shows the change derived from two succeeding acquisitions before and after the event from Dec 14, 2021.



The footprint of the hail event can be seen clearly in this map product. In any case biomass and yield are not directly correlated. We can define areas within single plots, where we see a bigger change, but in order to transform the derived values in loss of yield, a field inspection is needed.

Field inspections can be supported by zone maps like the example on the right side. Here we generated a **quantile** statistic in 10 zones using the loss map. This will not replace the loss assessment. It will still be necessary to collect reference data for a quantified loss map.

Such map products can help to **guide** the loss assessor to the relevant zones and help to better **aggregate** the hectarage of the different zones, which is an ambitious task for loss adjusters.

