



LANZAMIENTO CAMPAÑA FINA 2019 - 2020

#CAMPAÑAFINA1920



Bolsa
de Cereales

PROYECCIONES DE SIEMBRA Y PRODUCCIÓN CEREALES DE INVIERNO 2019/20

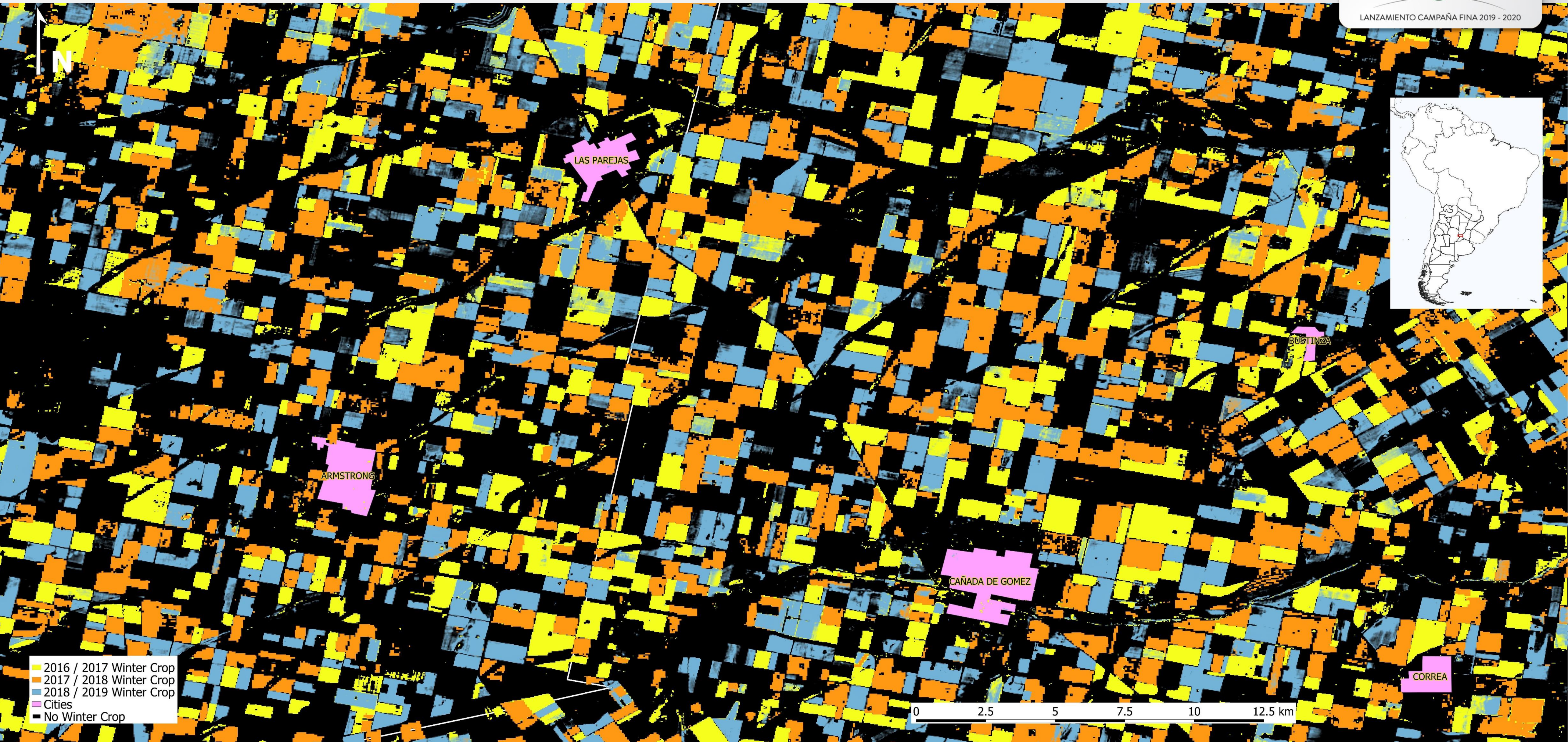
Ing. Esteban Copati – Estimaciones Agrícolas



LANZAMIENTO CAMPAÑA FINA 2019 - 2020

PROYECTOS ESTIMACIONES AGRÍCOLAS

IMÁGENES SATELITALES EN CULTIVOS DE INVIERNO / Trigo y Cebada hasta la campaña 2018/19



- 2016 / 2017 Winter Crop
- 2017 / 2018 Winter Crop
- 2018 / 2019 Winter Crop
- Cities
- No Winter Crop

IMÁGENES SATELITALES EN CULTIVOS DE INVIERNO / Trigo y Cebada hasta la campaña 2018/19



Welcome to Fall Meeting

**Bolsa de Cereales**

**UNIVERSITY OF MARYLAND**

**Harvest**

**AmeriGeo**

**GEO GROUP ON EARTH OBSERVATIONS**

**GEOGLAM**



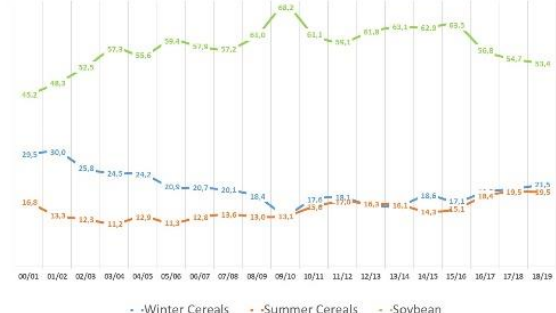
Remote sensing observations capture Winter crop rotation in Argentina.

E. Copati^{1*}, M. L. Humber², E. Puricelli², A. Sanchez², R. Sahajpal², I. Becker-Reshef²
¹ Buenos Aires Grain Exchange, ² University of Maryland, *ecopati@bc.org.ar

Background

A rational use of resources is essential to guarantee food security around the world. For this purpose, it is essential to identify relevant indicators that allow to track the adoption of sustainable practices in main productive areas. Thanks to climate, OGM and soils characteristics in Argentina, sustainable practices such as no-till is widespread adopted. However, no-till as well as many other practices are possible only in crop rotation systems with a balanced planted area between oilseed and cereal crops. Cereal crops provide large volume of stubble after its harvest and this stubble protects the soil from its degradation due to direct sun radiation or water and wind erosion. On the other hand, stubble helps to increase the amount of organic matter in the soil as well as its structure, improving different characteristics such as water infiltration and its retention. In Argentina main cereal crops are corn, sorghum and winter cereals mainly represented by wheat and barley. Since 2000/01 season up to now, the percentage of winter grasses in crop rotation have significantly decreased due to the implementation of policies, extremely climate condition and also due to different market variables, affecting at the same time the sustainability of agroecosystems. Crop rotation is also an important strategy in managing insects, diseases, and weeds, maximizing crop yield potential.

19 Years of Crop Rotation in Argentina



Methods Overview

- In order to map winter crop planted area, the first step is to study phenological stages development of wheat and barley during each season. Both crops share similar phenology development in a timeline and account for approximately 90% of winter crop area in Argentina.
 - The first date, T1, was selected during the seeding period, when NDVI values of wheat and barley are close to 0 due to the lack of vegetative coverage on its plots (fallow period following the previous harvest).
 - The second date, T2, was selected at the heading stage for both crops, when NDVI values reach their peak.
- Analysis of NDVI-images from Landsat-8 or Sentinel-2 scenes of both selected dates (T1, T2) was conducted. For ease of analysis, NDVI values were rescaled from the range [-1, 1] to [0, 2].
- The differences between the second and the first date (i.e. T2 - T1) were calculated to obtain two types of values:
 - Negative values: due to vegetation that was detected in the first date and then disappeared in the second one.
 - Positive values (typically between 0 and 0.5): due to vegetation actively growing during the winter until the spring time, when the peak of NDVI is reached by winter crops (e.g. wheat and barley plots).
- After running this methodology in at least two seasons, winter crop masks are overlapped in order to study crop rotation in a time line.

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Winter crops coverage's classification in the Southeast of the Buenos Aires province, Argentina.

E. Copati^{1*}, M. L. Humber², E. Puricelli², A. Sanchez², R. Sahajpal², I. Becker-Reshef², Dan O'Neill²
¹ Buenos Aires Grain Exchange, ² University of Maryland, *ecopati@bc.org.ar

Abstract

Accurate crop production data is fundamental for reducing uncertainty and volatility in the domestic and international agricultural markets. Earth observation data helps to quantify in a timely, precise and objective way different areas of food production at a regional and global scale. Developing countries like Argentina heavily rely in agriculture from an economic standpoint, where 60 percent of their exports are of agro-industrial origins. The Buenos Aires Grain Exchange (BAGE) is a non-profit organization that aims to provide free an open data related to crop production. The Agricultural Estimates Department of the BAGE estimates crop area, yield and production independently since 2000. By providing weekly objective information, the Grain Exchange helps different actors of the agricultural chain, such as producers, traders, seed companies, market analysts, policy makers, into their day to day decision making. Since 2015/16 season, the Grain Exchange has worked on the adoption of EO tools into their crop estimations together with the University of Maryland, and as a partner of NASA Harvest, by developing a new earth observations-based method to identify winter crop planted area at a regional scale, that is tailored to the budget constraints (such as hardware, software and knowledge) that developing countries such as Argentina have. The methodology is based on free GIS-Software, basic knowledge of satellite imagery analysis and free Landsat 8 images. Results of this methodology applied during 2016/17 winter crop season are presented at AGU 2017, under the name of "Winter Crops Coverage's Classification in the Southeast of the Buenos Aires Province, Argentina".

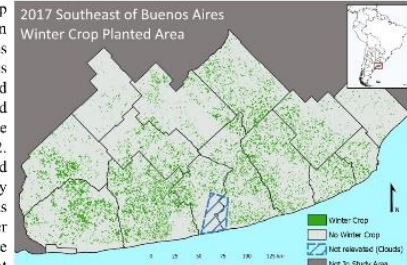
Data

Satellite	Reference	T1 Date	T2 Date
Landsat 8	224_86	6/11/2017	
	224_87	6/11/2017	
	225_86	5/1/2017	11/25/2017
	225_87	5/1/2017	11/25/2017
Sentinel 2	226_86	6/9/2017	11/16/2017
	226_87	6/9/2017	11/16/2017
	LC1C_T20HPC	05/27/2017	
	LC1C_T20HPC	05/27/2017	

Figure 1 (Left) Primary scenes used for winter crop classification. T1 date refers to early planting season. T2 date refers to peak vegetative season.

Results

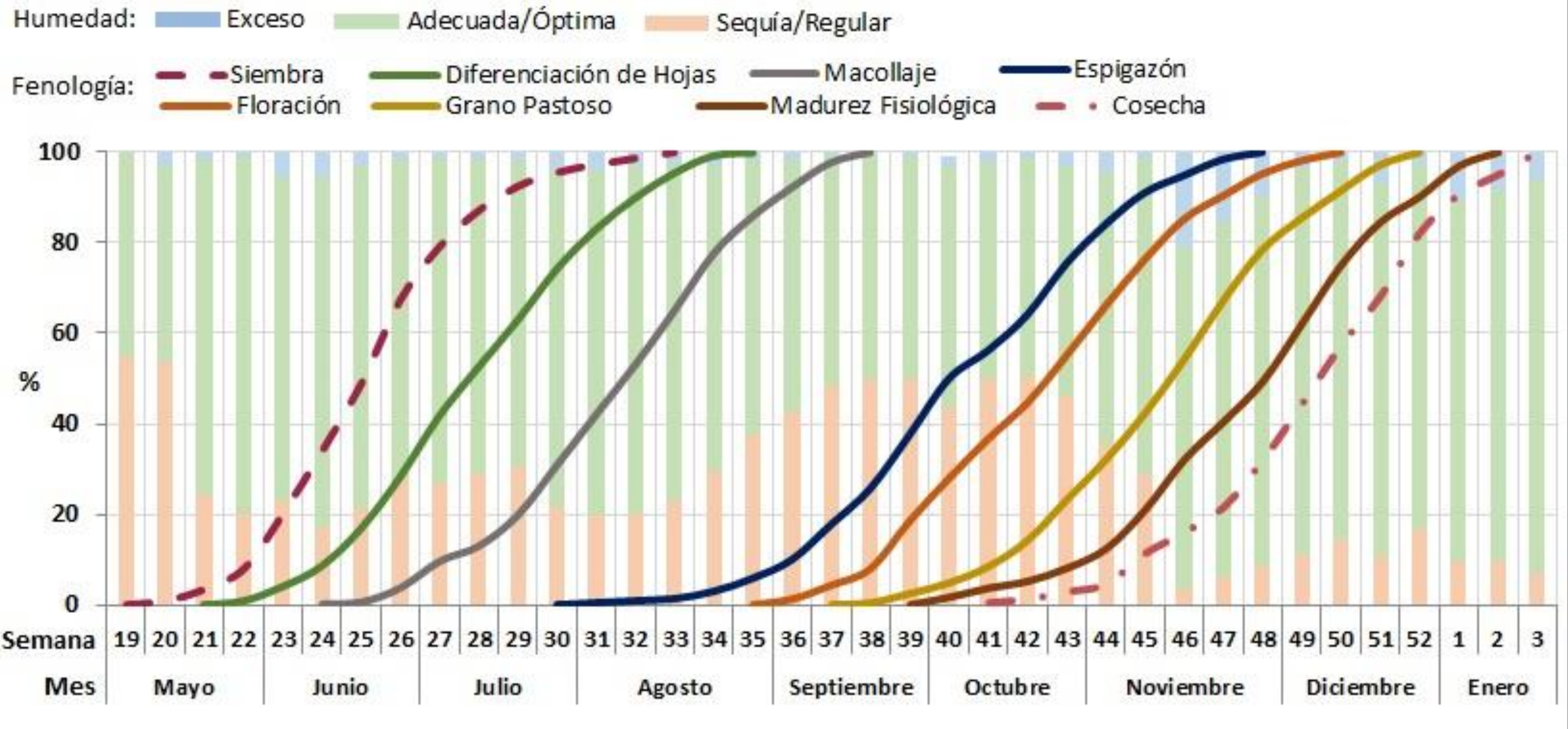
The 2017 winter crop planted area in Southeast of Buenos Aires province map is shown in Figure 2 and the satellite-based validation results are shown in Table 2. Visually, the planted area indicated by Figure 2 corresponds well with known winter cropped areas. The total cropped area at regional level is in agreement with published statistics within five percent for the Southeast of Buenos Aires region. Same methodology was ran with only Landsat-8 images during the 2016/17 season and its overall accuracy was 87.7 % that season. During the 2017/18 season Landsat-8 images were taken during crop-tours in the reproductive stages of the crops. The registered high percentage of cloud coverage during key date of this season was a challenge. A winter crop mask of main part of the region was possible to be generated from Landsat-8 images (there was a sector with clouds in the validation results show a high percentage of cloud coverage during key date of this season).







Evolución del Trigo 2018/19 en Argentina

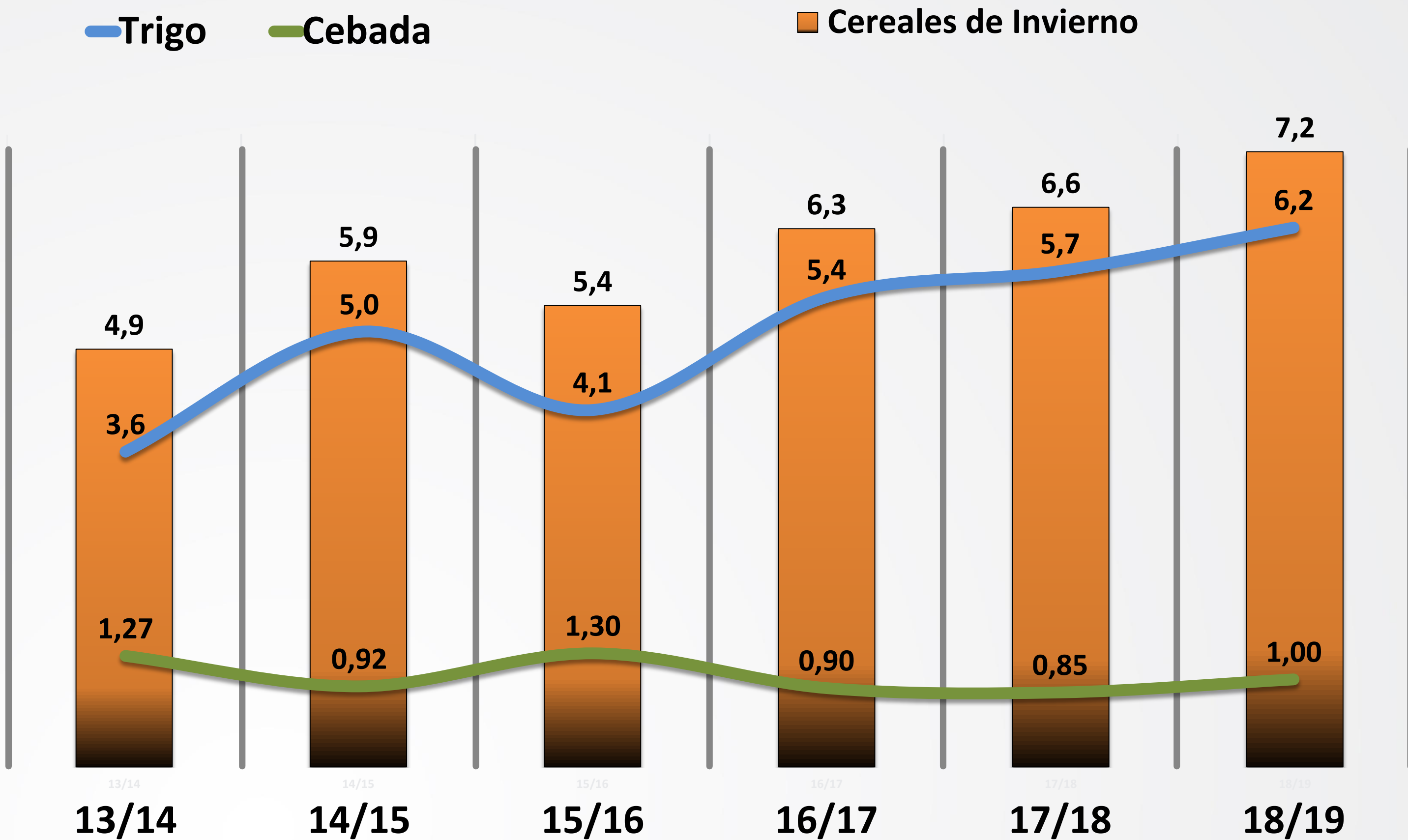


- Desarrollo fenológico de Maíz*, Soja*, Trigo y Girasol
- Seguimiento de condición hídrica y condición de cultivos
- Estudios a escala nacional y regional actualizados cada 7 días.

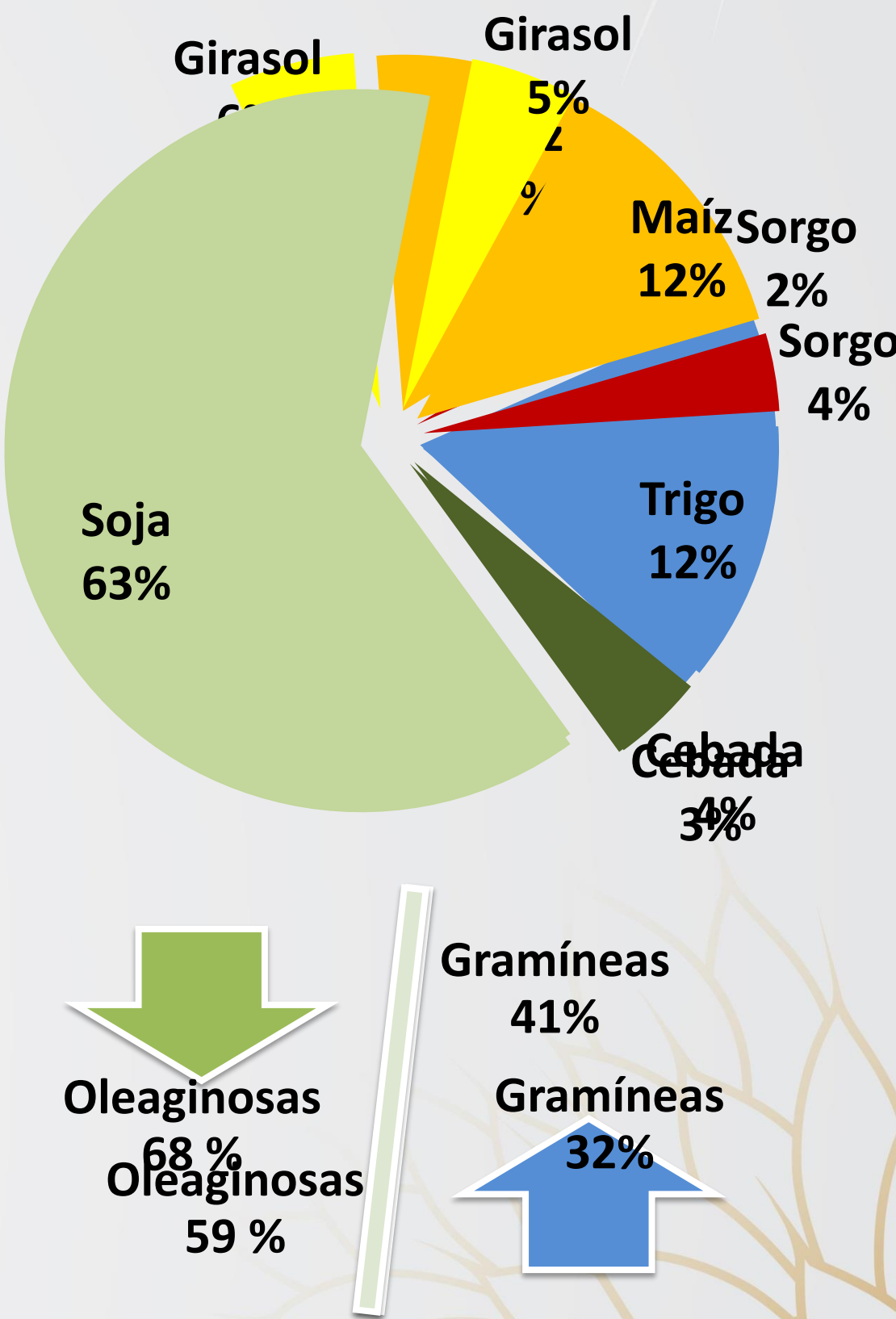


TRIGO Y CEBADA SIEMBRA Y PRODUCCIÓN HASTA EL CICLO 2018/19

EVOLUCIÓN DEL ÁREA SEMBRADA (MHa) / Trigo y Cebada hasta la campaña 2018/19



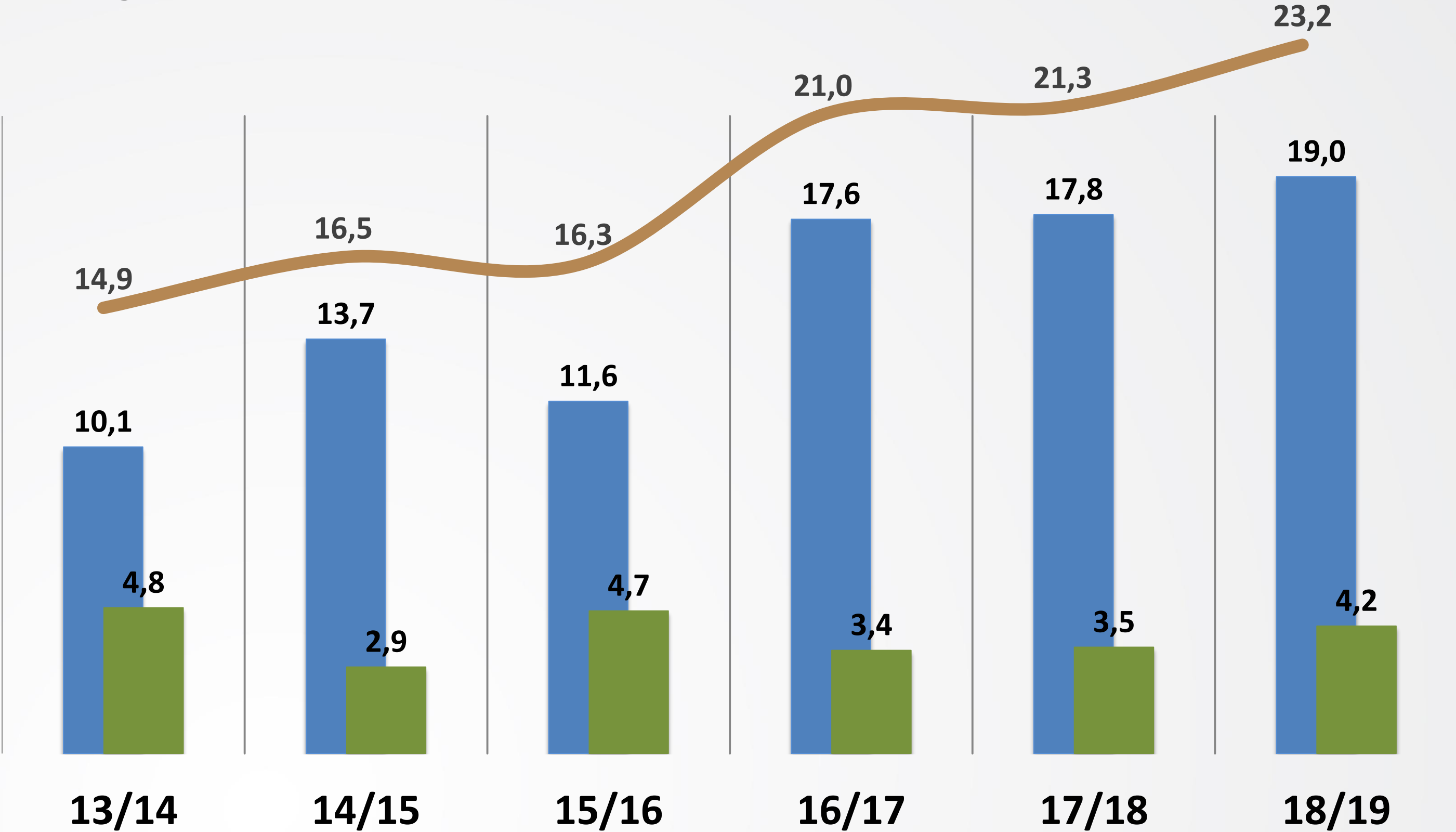
Rotación 18/19



EVOLUCIÓN DE LA PRODUCCIÓN (MTn) / Trigo y Cebada hasta la campaña 2018/19



■ Trigo ■ Cebada — Cereales de Invierno



18/19 vs 13/14





Trigo
+88 %



Trigo + Cebada
+56 %

TRIGO Y CEBADA PERSPECTIVAS DE SIEMBRA Y PRODUCCIÓN 2019/20

21 ENE 2019 - MODIS Terra 500m - RGB 721

Trigo: Rendimiento Promedio Nacional (qq/Ha)

$R^2 = 0,5755$

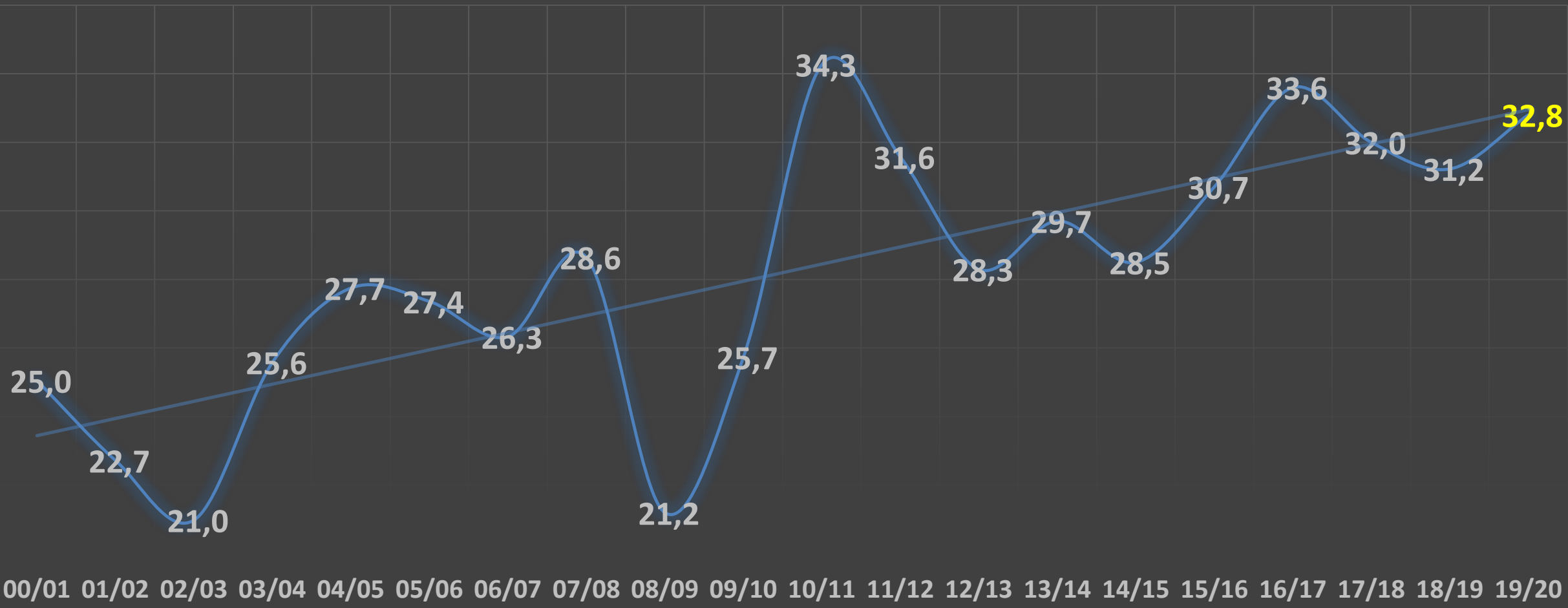


Imagen Composición RGB 721 - MODIS Terra - 500m



Favorable
Escenario Climático

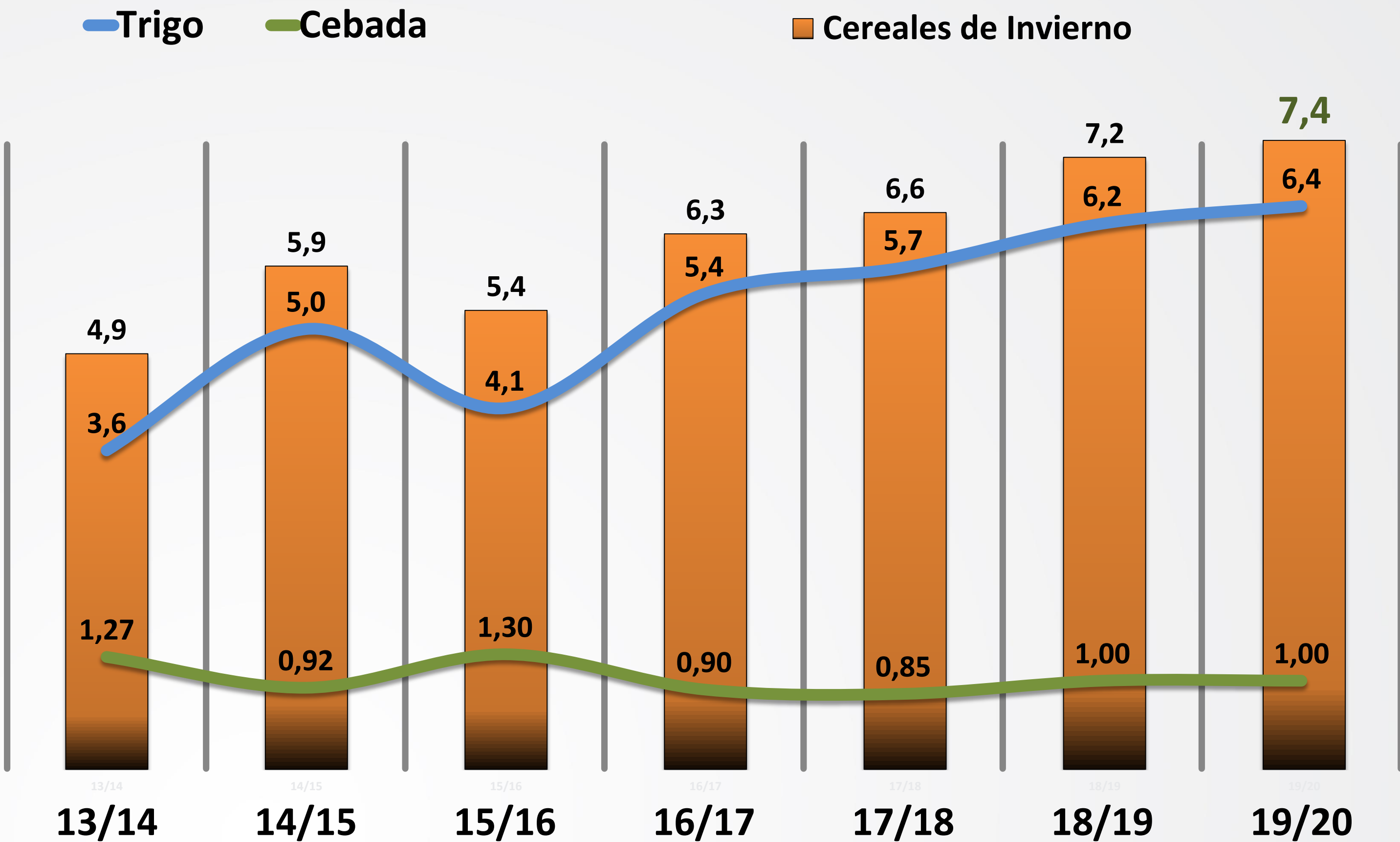


Recuperación de
Superficie



Control de Napas y
Malezas

ESCENARIO PRE-CAMPAÑA / Superficie Trigo y Cebada 2019/20 (MHa)

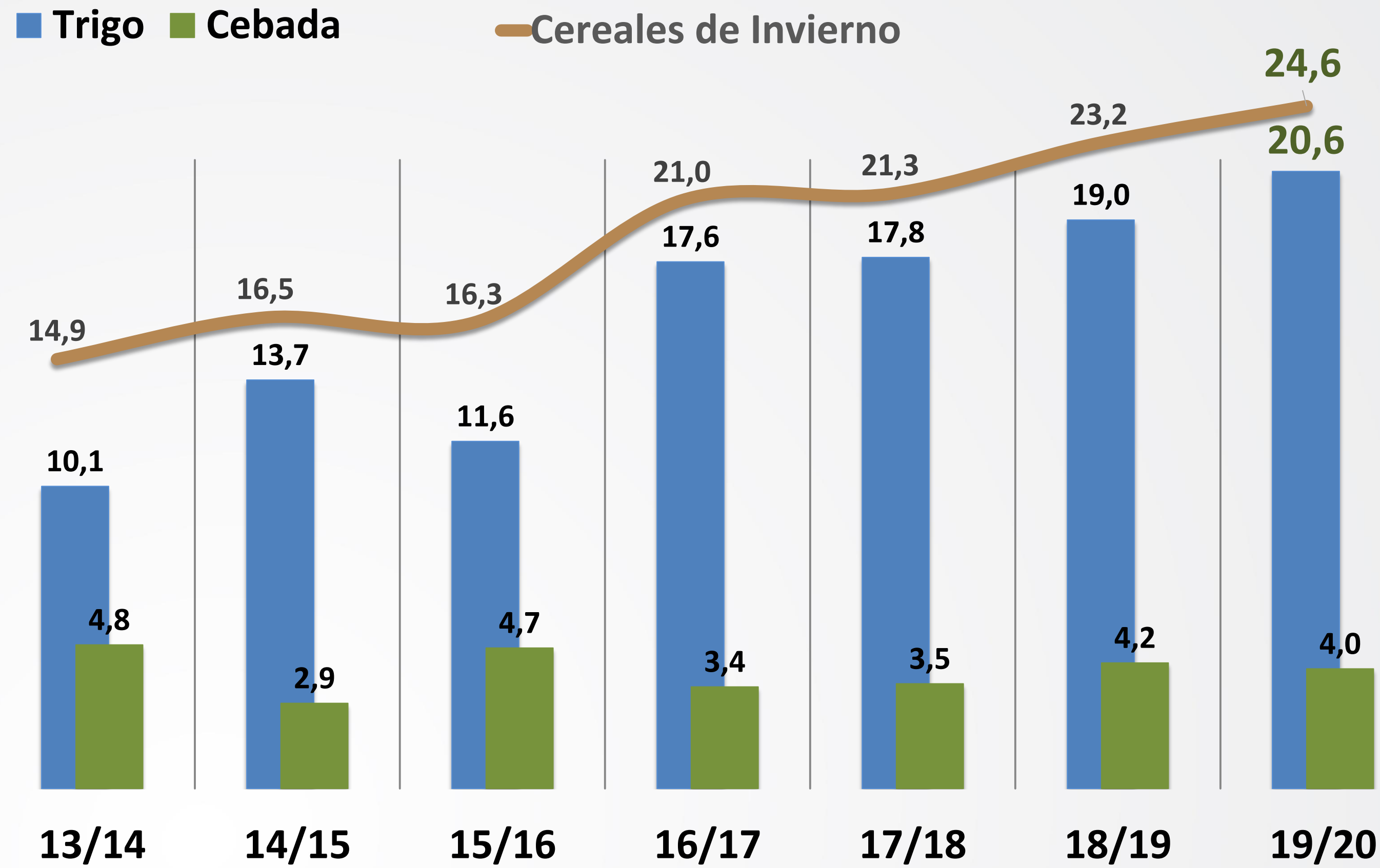


19/20 vs 18/19

↑ Trigo +3,2 %

↑ Trigo + Cebada +2,8 %

ESCENARIO PRE-CAMPAÑA / Producción Trigo y Cebada 2019/20 (MTn)



19/20 vs 18/19

↑ Trigo +8,4 %

↑ Trigo + Cebada +6 %



Trigo

6,4 MHa

20,6 MTn



Cebada

1 MHa

4 MTn

7.400.000 Ha / 24.600.000 Tn



LANZAMIENTO CAMPAÑA FINA 2019 - 2020

¡GRACIAS POR SU ATENCIÓN!

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