



*Sorghum: the safe
bet for the future*

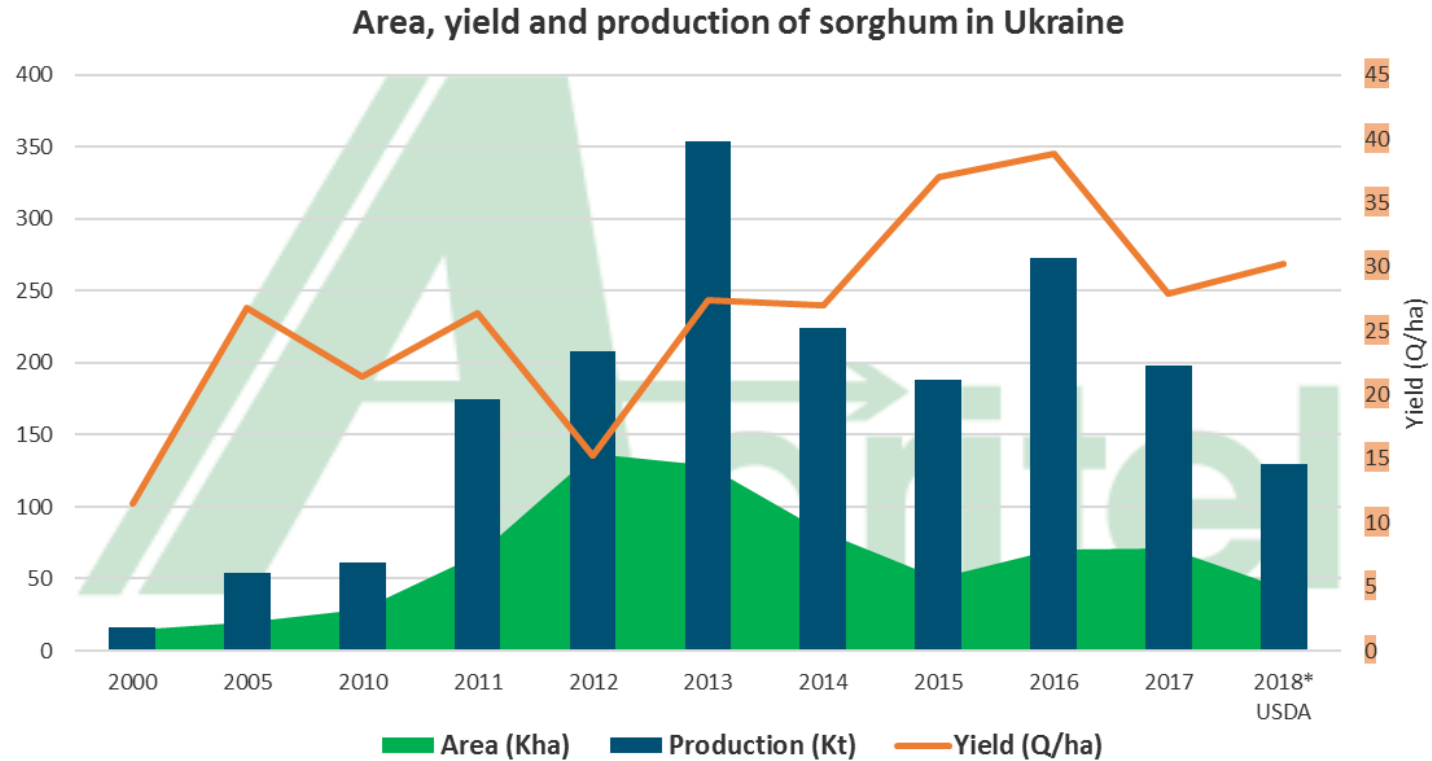
Economic study of the sorghum in Ukraine

Gautier MAUPU

Senior consultant
Agritel Ukraine







SORGHUM MARKET IN UKRAINE



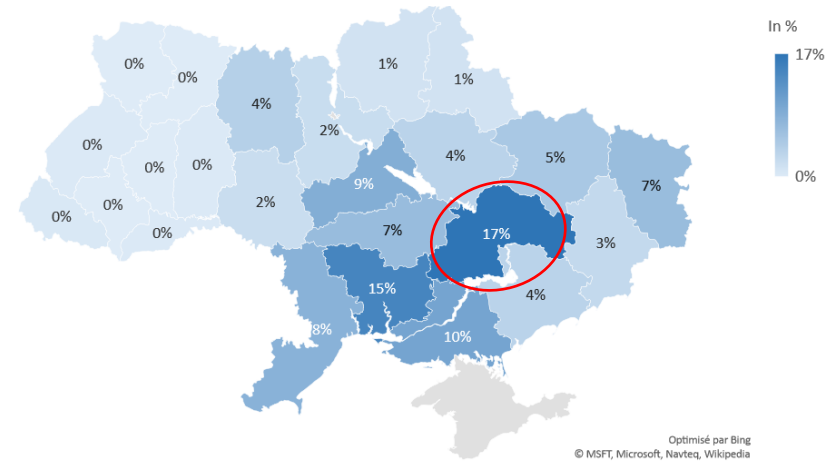
Source : Agritel, USDA, Agricultural Ministry in Ukraine

Sorghum areas have jumped from 2010 thanks to higher prices and to the sector's willingness to develop this crop

REGION STUDIED – DNIPRO IN THE EAST

| | Sorghum | Corn | Soybean | Sunflower |
|-----------------------------------|---|--|--|---|
| Planted areas 2015/16/17 | 10 600 ha | 318 000 ha | 6 900 ha | 597 000 ha |
| Trend evolution for last 5 years* |  (-47 %) |  (+1 %) |  (-44 %) |  (+16 %) |
| % national production** | 11 % | 4 % | 0,3 % | 10 % |

Share of sorghum areas for the last 3 years in Ukraine



*: average 11/12/13 vs 16/17/18

** : average 15/16/17

Source : Agritel, Ministry of Agriculture in Ukraine

The choice to study Dnipro region makes sense because of its large surfaces, but can be challenged due to a low yield potential.

| | |
|------------------------------|-----------------------------------|
| Rainfall (April/September) | 240 mm (from 2016 to 2018) |
| Average T° (April/September) | 18.1 °C (from 2016 to 2018) |
| Type of soil | Tchernozioms richs/poors |
| Crop rotation | (Corn)/Wheat/Rape/Barley/SFS |

Source : Agritel, Reuters

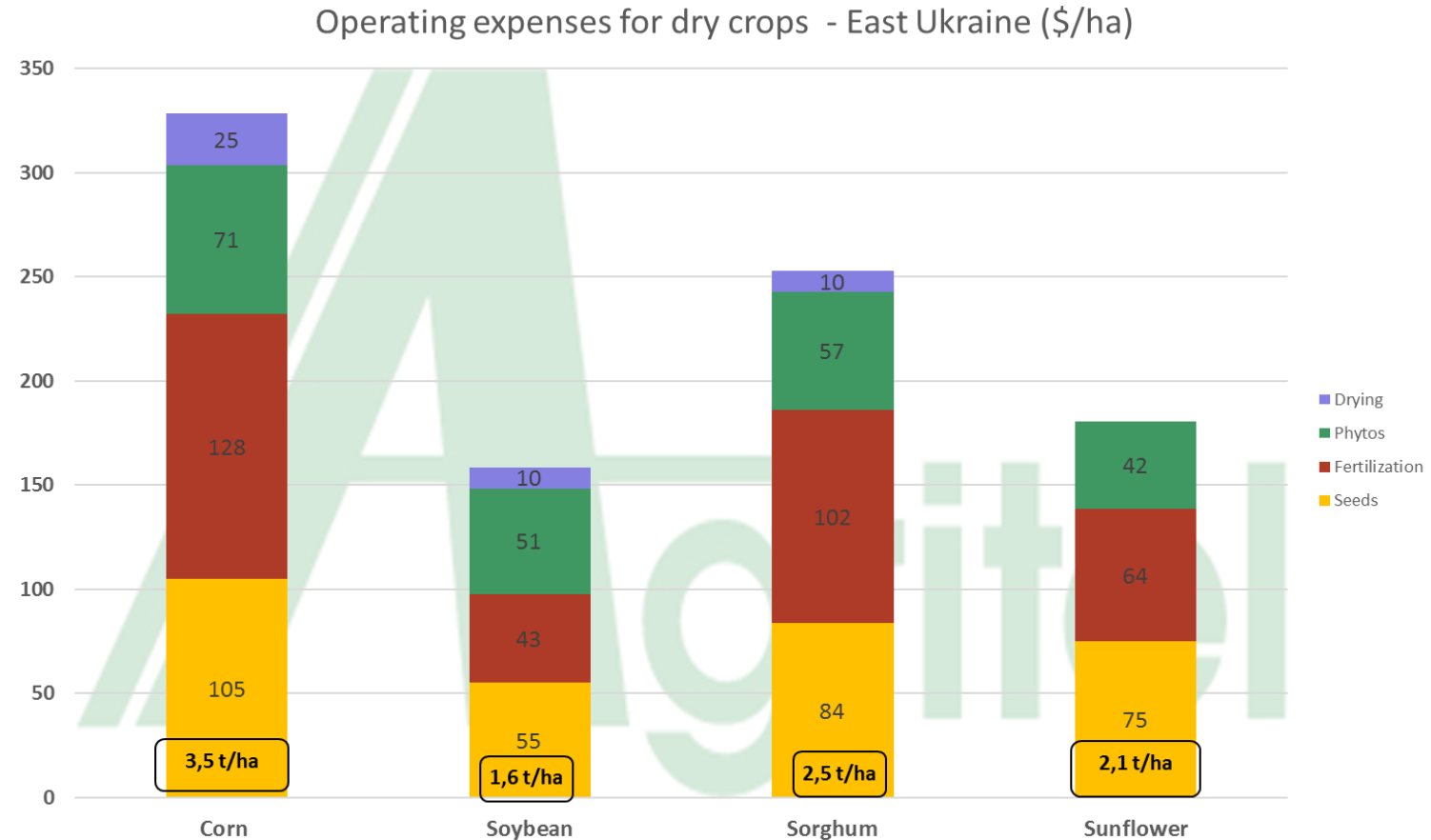
TECHNICAL CHARACTERISTICS

- Dry crops in Dnipro -

| | Corn | Soybean | Sorghum | Sunflower |
|---|-----------------|---------------------------|-----------------|-----------------|
| Group of precocity | Early | Mid-Late | Mid-Early | Medium |
| Sowing density (grains/ha) | 50 000 | 400 000 | 200 000 | 40 000 |
| Seeds origin | 100 % Certified | 50% Farm 50% Certified | 100 % Certified | 100 % Certified |
| Water regime | Rainy | Rainy | Rainy | Rainy |
| Mineral fertilization N (in kg/ha) | 150 | / | 120 | 30 |
| Mineral fertilization P2O5 (in kg/ha) | 45 | 40 | 35 | 45 |
| Mineral fertilization K2O (in kg/ha) | 30 | 40 | 20 | / |
| Humidity at harvest (in %) (Target which can be difficult to reach) | ≈ 15% | 14%-16% | 16% | < 9% |

For information, Agritel estimates the GMO/ non-GMO soybean rate at 50/50 in Ukraine.

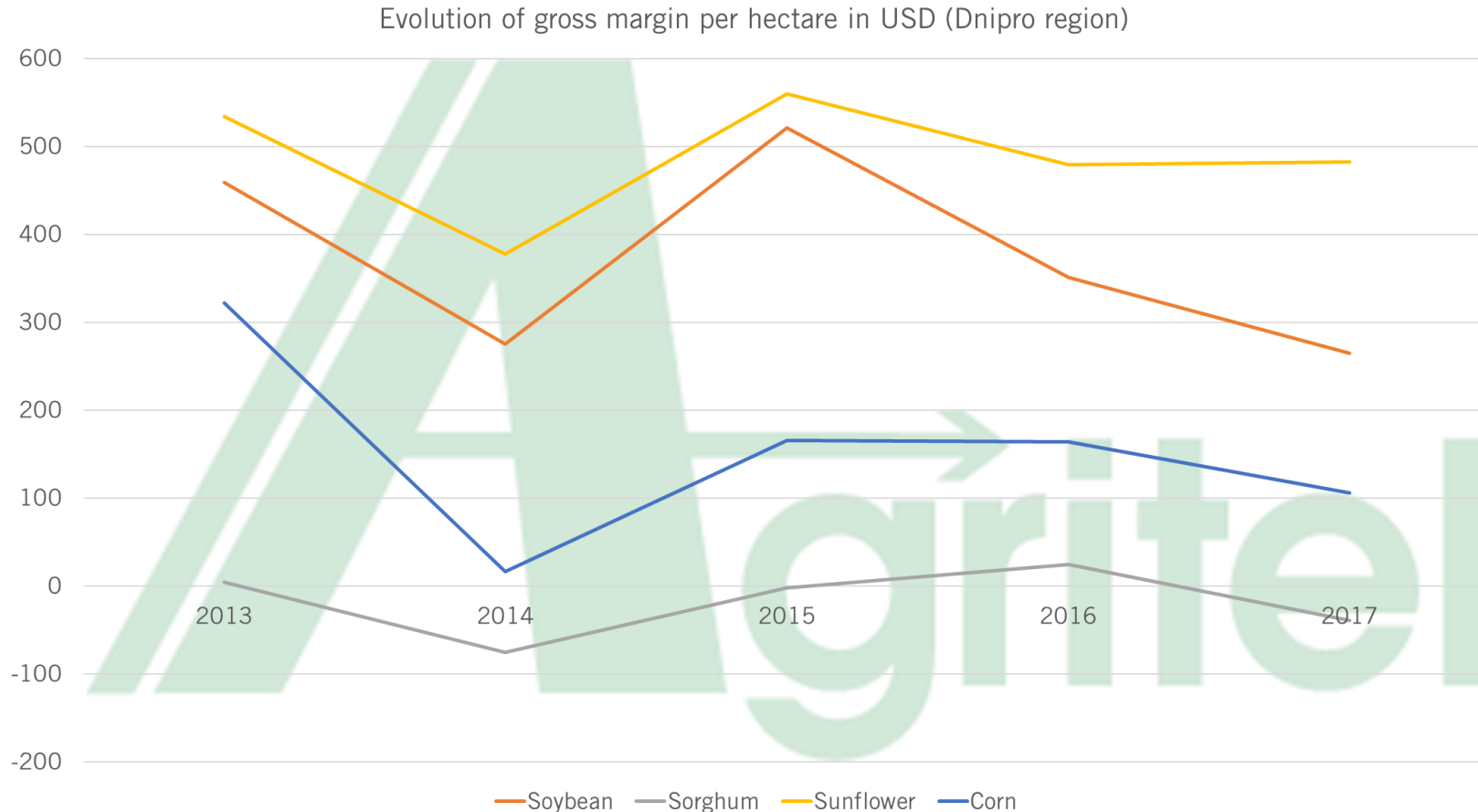
OPERATING EXPENSES OF SORGHUM COMPARED TO OTHERS DRY CROPS - Dnipro region -



Source : Agritel according to Ministry of Agriculture and clients

Yields are low in Dnipro region because of the dry weather.

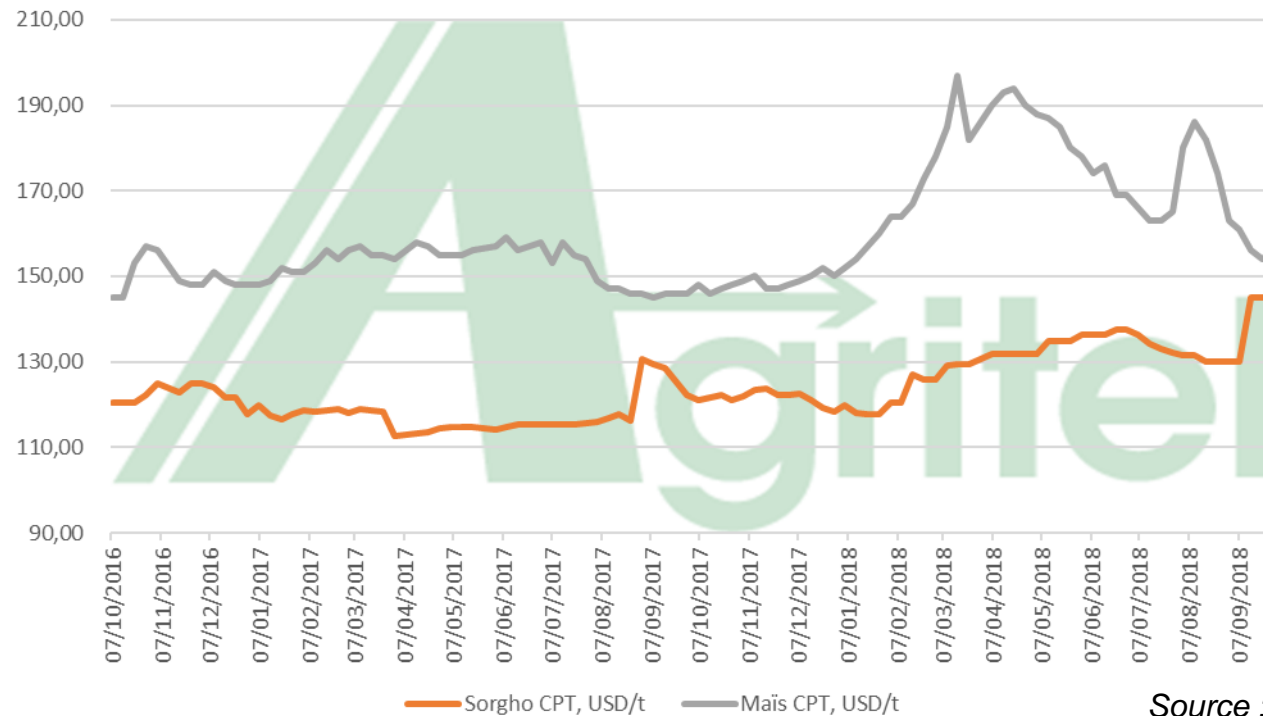
EVOLUTION OF « GROSS MARGIN » INDICATOR FOR SPRING CROPS (DRY) - DNIPRO REGION -



The sorghum gross margin is the lowest in comparison with other spring crops. It can even sometimes be negative, because of low prices and yields

SORGHUM PRICES IN UKRAINE IN COMPARISON WITH CORN

Evolution of sorghum and corn prices in Ukraine – CPT port (USD/t)

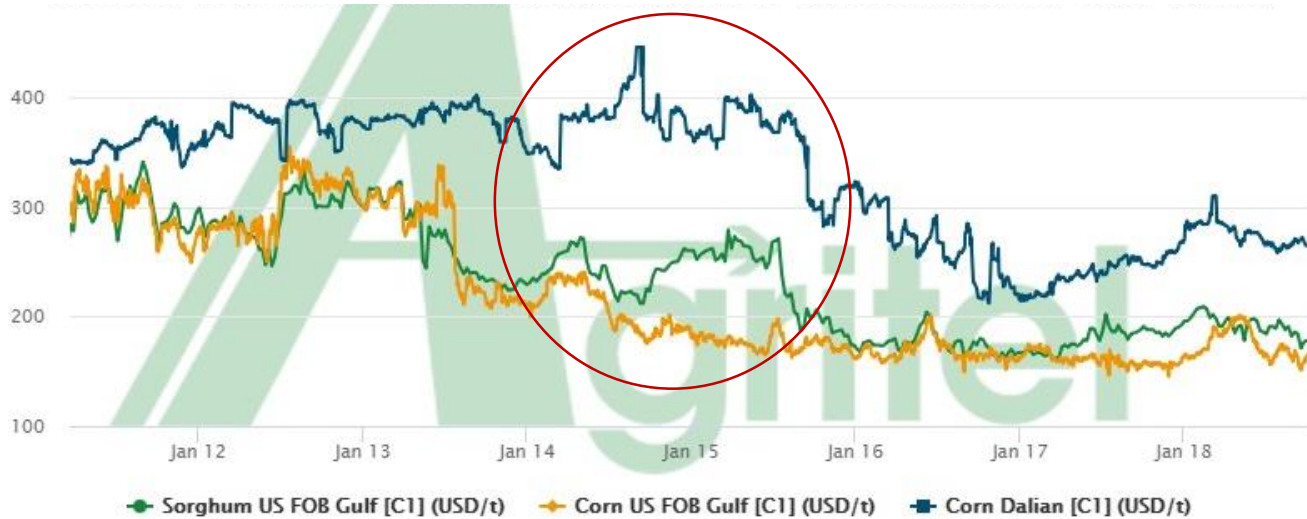


Source : Agritel

Sorghum prices in Ukraine are much lower than corn, and is not fostering the production, contrary to the situation in the United States.

STUDY OF SORGHUM PRICES IN THE USA

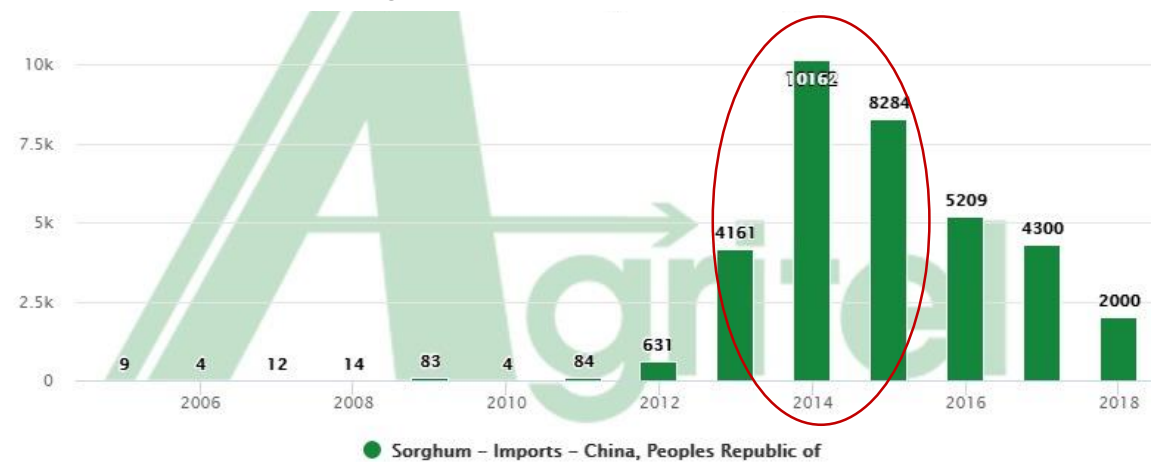
Evolution of sorghum and corn prices in the USA and corn in China (USD/t)



Powered by Agritel Data Explorer
Source : Agritel

Sorghum prices in the USA are higher than corn since 2014, thanks to a strong buying interest from China, especially between 2014 and 2016 when corn prices in China were very expensive (subsidized).

Sorghum imports in China (Kt)



Powered by Agritel Data Explorer

Source : Agritel, USDA

Since corn prices in China have dropped, sorghum imports are decreasing...

CONCLUSION

- ➔ The sorghum in Ukraine is experiencing difficulties to develop for several reasons:
 - The margin is more important for sunflower in dry regions and for corn in humid regions.
 - The price is much lower than corn, contrary to the USA (only one buyer)

- ➔ In terms of agronomy, the cost of production is lower than corn and this crop could have a better future in Ukraine

- ➔ The sorghum could have a potential of development in Ukraine, with a more-structured sector. The Chinese market could be an outlet if volumes increase