



Faites vos jeux, rien ne va plus – The 2012 Mycotoxin Roulette

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ABSTRACT

The year 2012 was an extraordinary year with respect to mycotoxin contamination. Some parts of the world suffered from an extreme drought which lead to high aflatoxin concentrations. Other parts had excessive rainfall in early summer which led to high Fusarium toxin concentrations. But not only was the quality of crops affected by the extreme weather conditions, but the quantities available as well. The US corn harvest is down by more than 10% compared to 2011, yet at the same time the demand in other parts of the world for corn is increasing.

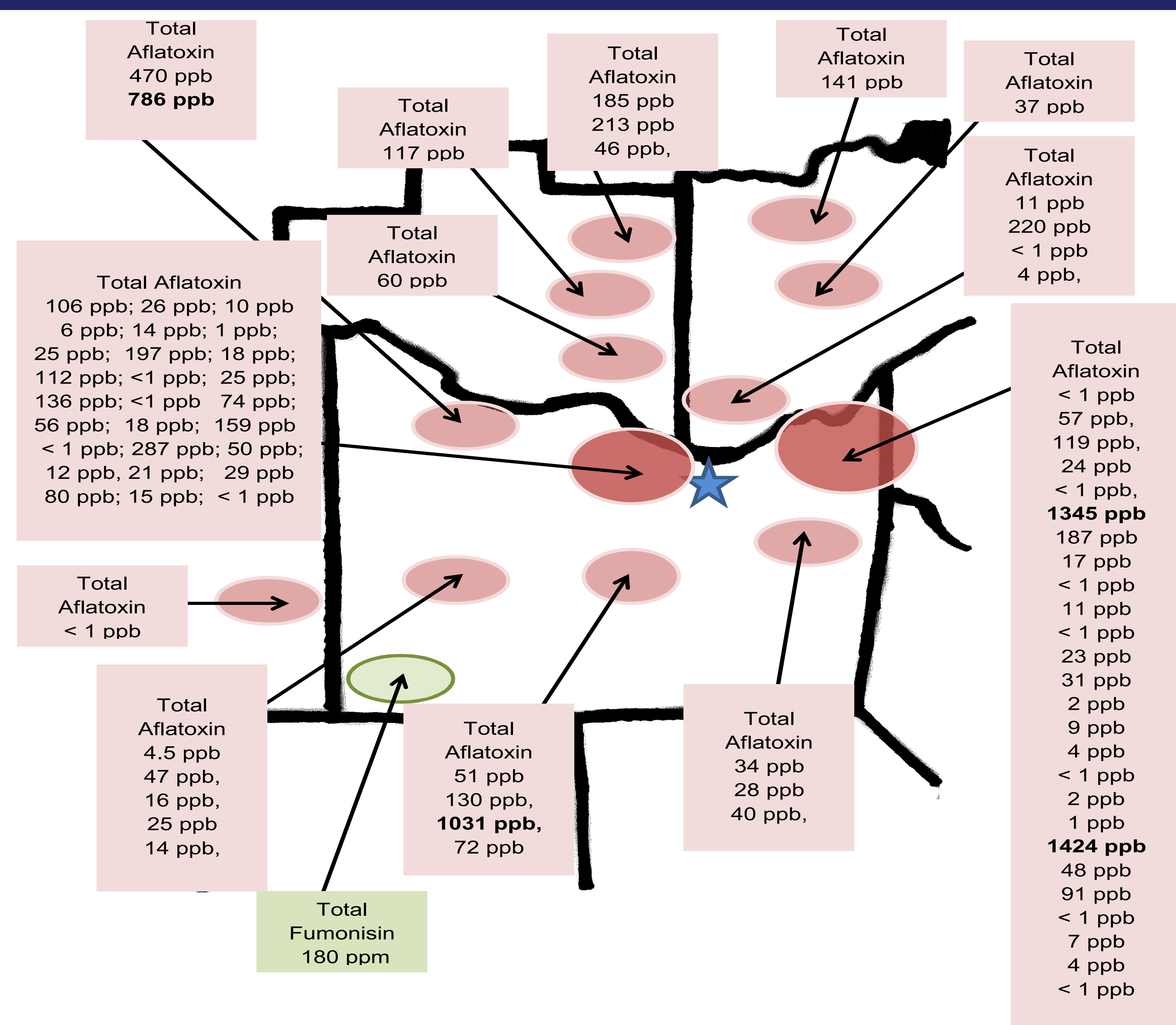
We have monitored the occurrence of mycotoxins in the US cereal crops and can show how extreme changes in weather conditions from wet and cold as in the 2009 / 2010 growing seasons, to hot and dry as in 2012, affect the mycotoxin occurrence in major US crops. Data presented below show large fluctuations in mycotoxin contamination may occur between production areas in close vicinity. Also in Europe we observed large fluctuations in mycotoxin contents in wheat from different areas. With mixing of these trade flows, it becomes very difficult to control the mycotoxin risks. For producers, buyers and in the end the technicians responsible for the analysis of mycotoxins this creates a level of uncertainty.

PROCEDURE

Samples were collected by Trilogy Analytical Laboratory from September 1, 2012 to February 15, 2013 to monitor the mycotoxin situation in the local area where Trilogy Analytical is located. This area was comprised of Franklin county, Missouri and surrounding areas including small parts of Gasconade, Warren, and St. Charles counties in Missouri. The sampling area consists of approximately 900 square miles and is located in the central eastern portion of the state of Missouri, USA.

Local grain elevators and farmers submitted samples of corn from the planting period of March 15, 2012 to June 1, 2012. All samples were ground, extracted, and tested for Total Aflatoxins using method AOAC #994.08 with modifications. Results were compiled and the locations of the samples were noted to illustrate the variability of mycotoxin contamination.

RESULTS



CONCLUSIONS

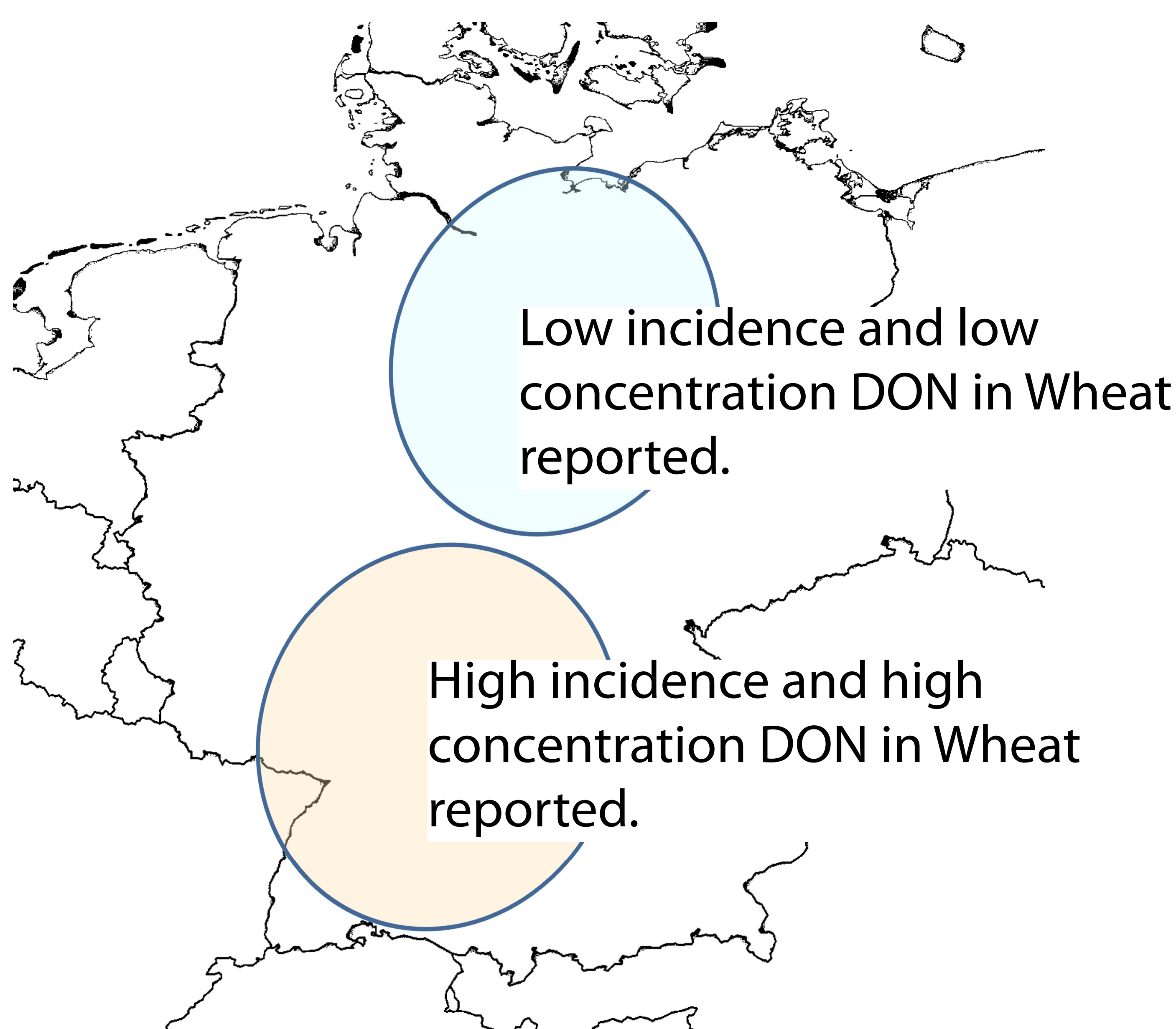
Mycotoxin analysis data of this year's cereals harvest in the United States and Europe show a remarkable variance in occurrence and concentration. Within relative small areas, large fluctuations in concentration and occurrence of mycotoxins are found. In previous years we could observe a more or less "homogeneous" mycotoxin occurrence pattern but the 2012 harvest is what we might call "spotty". Given the large fluctuations on a relative small area batches with different concentrations of mycotoxins get easily mixed.

For buyers of cereals, producers of cereal products or traders this is a very uncomfortable situation with many uncertainties about the quality of the crops. In that scenario, with so many uncertainties, every technician and QC manager wants to be at least sure that he or she can rely on the result of the testing methods used. To assure the testing methods are actually giving a precise and accurate result, it is inevitable to use mycotoxin reference materials. Trilogy Analytical Laboratory offers this reference material globally as a quality assurance tool for mycotoxin testing laboratories.

RESULTS continued

Franklin County Missouri (county in center of map) represents approximately 900 square miles. It is approximately 35 miles at its widest point east to west and from 25 to 40 miles north to south.

For the harvest of 2012 in Franklin County Missouri, it was very common to have corn very highly contaminated with aflatoxin next to a field with no detectable aflatoxin. Trilogy analyzed samples as high as 1300 to 1400 ppb growing in close proximity to fields with less than 1 ppb total aflatoxin. Fumonisin contamination also ranged from less than 0.1 ppm to 180 ppm within this county. Planting times for this county ranged from late March to Early June. The average yield in Franklin County was approximately 100 bushel/acre, however some yields were extremely low.



The European cereal crops showed a rather mixed pattern. In Germany, wheat is cultivated throughout the country (with a strong emphasis on the center). Wheat from the southern and particular south-western part (Bavaria, Baden-Württemberg) showed a frequent and relative high DON contamination in wheat (average app. 0.7 ppm). In the center and north-eastern part (e.g. Thuringia) the DON incidence in wheat was much lower. Rainfall in early summer in the South-West caused a high incidence of Fusarium toxins in this area, whereas other growing areas had better weather conditions. Again we found large differences in mycotoxin content in samples within short distances.