MEGA TRENDS in World Grain Markets

27 August 2018
• Prediction is very difficult, especially if it's about the future.
  
  * Niels Bohr (Danish Physicist)

  I try not to get involved in the business of prediction. It's a quick way to look like an idiot.
  
  * Warren Ellis (British Author)

• I am cautious about **prediction**; I discovered years ago that my correct **predictions** are forgotten, the others meticulously remembered.
  
  * Joseph Schumpeter (Economist, Harvard)
US Wheat Associates
North Asia Marketing Conference

- **IMPORTANCE OF INDIA AND AFRICA – THE NEW ‘CHINA’**
  - Population Growth versus Decline in Western World
  - Consumption Increase
  - Infrastructure Needs Critical
    - Ports, Roads, Storage, Distribution

- **THE BLACK SEA, CONSOLIDATION AND NEW TRADE FLOWS**
  - Trade, Tariffs, Restrictions
  - Fewer Entities, More Risk
  - COFCO Model – How Integrated Will Consumers Become?

- **RISK MANAGEMENT TOOLS EVOLVE**
  - Block Chain
  - New CME Regional Based Risk Management Tools
    - BS Wheat Contract
    - More Tools Coming

- **PRECISION AG, RESEARCH AND WHEAT**
  - Five Years of Extraordinary Production, Then BAMMM!
  - Is Market Sending Correct Signals
  - US Acreage – A Soybean/Wheat Story…Not Corn vs Wheat
  - Need for GMO Wheat …to Serve Africa, India
IMPORTANCE OF INDIA AND AFRICA – THE NEW ‘CHINA’

An Indian and African Story
World population 'to hit 9.7bn by 2050'

- Projection
- 0.6bn
- 1bn
- 1.2bn
- 1.6bn
- 2.5bn
- 6.1bn
- 7.5bn (2015 current population)
- 9.7bn*
- 11.2bn*

Source: United Nations
Population projections, 2015-2100

SOURCE: UN Population Division, “World Population Prospects, the 2015 Revision”
# US Wheat Associates

**North Asia Marketing Conference**

<table>
<thead>
<tr>
<th>World, Region, Country</th>
<th>2015</th>
<th>2025</th>
<th>2040</th>
<th>2050</th>
<th>Change</th>
<th>% change</th>
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<td>101</td>
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<td>738</td>
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<td>438</td>
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<td>494</td>
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<td>Russia</td>
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<td>143</td>
<td>136</td>
<td>129</td>
<td>-15</td>
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Consuming Countries population possibly will increase steadily

Producing Countries will see stagnant population

Welcome to Asian and African Markets

Indian population will overtake China around 2025 and will only slow down growing in 2045 (in normal situation)
## US Wheat Associates
### North Asia Marketing Conference

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<thead>
<tr>
<th>Rank</th>
<th>Population (2100)</th>
<th>City</th>
<th>Country</th>
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<td>88.3 million</td>
<td>Lagos</td>
<td>Nigeria</td>
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<td>#2</td>
<td>83.5 million</td>
<td>Kinshasa</td>
<td>DRC</td>
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<td>#3</td>
<td>73.7 million</td>
<td>Dar Es Salaam</td>
<td>Tanzania</td>
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<td>#4</td>
<td>67.2 million</td>
<td>Mumbai</td>
<td>India</td>
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<tr>
<td>#5</td>
<td>57.3 million</td>
<td>Delhi</td>
<td>India</td>
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<tr>
<td>#6</td>
<td>56.6 million</td>
<td>Khartoum</td>
<td>Sudan</td>
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<tr>
<td>#7</td>
<td>56.1 million</td>
<td>Niamey</td>
<td>Niger</td>
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<tr>
<td>#8</td>
<td>54.3 million</td>
<td>Dhaka</td>
<td>Bangladesh</td>
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<td>#9</td>
<td>52.4 million</td>
<td>Kolkata</td>
<td>India</td>
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<tr>
<td>#10</td>
<td>50.3 million</td>
<td>Kabul</td>
<td>Afghanistan</td>
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<tr>
<td>#11</td>
<td>49.1 million</td>
<td>Karachi</td>
<td>Pakistan</td>
</tr>
<tr>
<td>#12</td>
<td>46.7 million</td>
<td>Nairobi</td>
<td>Kenya</td>
</tr>
<tr>
<td>#13</td>
<td>41.4 million</td>
<td>Lilongwe</td>
<td>Malawi</td>
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<td>#14</td>
<td>40.9 million</td>
<td>Blantyre City</td>
<td>Malawi</td>
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<td>Kampala</td>
<td>Uganda</td>
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<td>#17</td>
<td>40.0 million</td>
<td>Manila</td>
<td>Philippines</td>
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<tr>
<td>#18</td>
<td>37.7 million</td>
<td>Lusaka</td>
<td>Zambia</td>
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<tr>
<td>#19</td>
<td>36.4 million</td>
<td>Mogadishu</td>
<td>Somalia</td>
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<tr>
<td>#20</td>
<td>35.8 million</td>
<td>Addis Ababa</td>
<td>Ethiopia</td>
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</table>

Source: Global Cities Institute – University of Toronto, Canada
• Lagos-Calabar, Nigeria coastal railway
• Mombasa-Nairobi, Kenya railway
• Addis Ababa-Djibouti railway
• The Shenzhen of East Africa
  — Tanzania-Zambia railway (Tazara), the mother of all Chinese infrastructural projects in Africa and the third-largest infrastructural project ever undertaken in Africa at the time (after the Aswan and Volga dams).
  — Half a century later, plans are underway for China’s Merchant Holding International (CMHI) and Oman’s sovereign wealth fund to invest USD11 billion in a new megaport and economic zone at Bagamoyo, a sleepy port town 60km north of Dar es Salaam.

• New Cairo
• Lobito-Luau railway, Angola
US Wheat Associates
North Asia Marketing Conference
US Wheat Associates
North Asia Marketing Conference

One belt, one road – China’s new Silk Road

- Planned Silk Road economic belt
- Planned maritime Silk Road
- Member states of AIIB (Asian Infrastructure Investment Bank)
- Harbor with Chinese involvement

Source: MERICS, DW | 12/2015

© DW
Everything we hear is an opinion, not a fact.

Everything we see is a perspective, not the truth.

- Government Data Accuracy
- Problem of MBR Fumigation
- Import Regulation and Duties
- Import Margins
- Government Intervention Price
- Government Distribution Price
THE BLACK SEA, CONSOLIDATION
and NEW TRADE FLOWS
Global Wheat Production Slightly Above Consumption

- Production (Red)
- Consumption (Blue)

**MMT**

- 11/12
- 12/13
- 13/14
- 14/15
- 15/16
- 16/17
- 17/18
Chart 6. Average protein content of Russian wheat, percent
Main destinations of Russian wheat exports in July-Mar 2017/18 MY
(Основные направления экспорта пшеницы из России в июле-марте 2017/18 МГ)

- Egypt: 25%
- Turkey: 23%
- Bangladesh: 2%
- Indonesia: 2%
- Nigeria: 4%
- Sudan: 2%
- Azerbaijan: 4%
- Lebanon: 6%
- EU: 4%
- Kenya: 2%
- South Africa: 3%
- UAE: 6%
- Yemen: 4%
- Vietnam: 2%
- Tanzania: 3%
- Others: 13%
US Wheat Associates
North Asia Marketing Conference

Wheat Export from Ukraine in Jul-May 2017/18 MY
TOP-10 Buyers, thsd. tons

- Indonesia: 2,107 (+645)
- Egypt: 2,446 (-660)
- Bangladesh: 1,657 (-160)
- Philippines: 1,084 (+398)
- Spain: 1,079 (+678)
- Korea, South: 1,063 (-98)
- Morocco: 979 (-35)
- Tunisia: 908 (+279)
- Thailand: 1,488 (-780)
- India: 2,909 (-2,409)

<table>
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<tr>
<th>Country</th>
<th>2017/18 Jul-May</th>
<th>2016/17 Jul-May</th>
<th>Δ, thsd. tons</th>
<th>Δ, %</th>
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<tr>
<td>10 Buyers</td>
<td>11,577</td>
<td>13,719</td>
<td>-2,142</td>
<td>x</td>
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<tr>
<td>Others</td>
<td>4,694</td>
<td>3,083</td>
<td>1,611</td>
<td>x</td>
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<tr>
<td>Total</td>
<td>16,271</td>
<td>16,802</td>
<td>-530</td>
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</tr>
<tr>
<td>Country</td>
<td>6/30/17</td>
<td>7/31/17</td>
<td>8/31/17</td>
<td>9/30/17</td>
</tr>
<tr>
<td>-------------------------------</td>
<td>---------</td>
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<td>AE-UNITED ARAB EMIRATE</td>
<td>51,000</td>
<td>33,000</td>
<td>42,000</td>
<td>52,000</td>
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Russian Wheat - Top Export Destinations

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US Wheat Associates
North Asia Marketing Conference

• Comparisons of Black Sea Wheat vs US Origin
  – Monolithic Shipments vs Combo Cargoes
  – Two Varieties of BS Wheat vs Multiple Varieties of US Wheat
  – Spot Market in BS vs Forward Market in US
  – “Dependent” Inspection vs Independent Inspection
  – Differences in Weighting
  – Political Risks
Firms That Bossed Agriculture for a Century Face New Threat: Farmers

- Running expanded, consolidated operations, farms are pushing Cargill and ADM for better prices and are sometimes competing with them directly

— WSJ Article, August 15, 2018
- **INDUSTRY CONSOLIDATION**
  - **Drivers**
    - Finances - Banks
    - People Shortages
  - Consolidation and Asset ROI Focus
  - No Traders, No Trading
  - Pushes Risk Back To Importers
  - Increasingly Specialized Needs
  - **Examples**
    - Nidera/Noble/COFCO
    - Glencore/Viterra
    - ADM Acquisitions – Toepher
    - Bunge/Saudis/Canadians
  - **Implications**
    - Fewer Players...MORE Risk
    - Acquisition of Destination Users
INCREASINGLY DIFFICULT PRICE DISCOVERY

- Fewer Sellers, Less Competition
- Increasingly Wider Bid/Offer Spreads
- Local Competition Skewed
- New Procurement Models
  - Vertical Integration
  - Joint Ventures
- A Need For Independent Information, Support
Risk Management Tools Evolve
US Wheat Associates
North Asia Marketing Conference
Blockchain and blockchain-based distributed ledger technologies can have tremendous impact on the global trade supply chain. Trade organizations such as Dubai Chamber of Commerce and Industry have also launched an initiative to leverage blockchain technology to address global trade issues such as high costs and lack of transparency and security.

In addition to making movement of goods more efficient and reliable, blockchain-based solutions are disrupting the world of trade financing. For example, blockchain is being used to simplify the long and tedious process of obtaining a Letter of Credit (LoC), a payment mechanism used in international trade.
Bitcoin Beginnings

You can’t discuss the history of blockchain technology without first starting with a discussion about Bitcoin. Shortly after Nakamoto’s whitepaper was released, Bitcoin was offered up to the open source community in 2009. Blockchain provided the answer to digital trust because it records important information in a public space and doesn’t allow anyone to remove it. It’s transparent, time-stamped and decentralized.

“Blockchain is to Bitcoin, what the internet is to email. A big electronic system, on top of which you can build applications. Currency is just one,” Sally Davies, FT Technology reporter.

Blockchain Separates from Bitcoin

Even today, there are many who believe Bitcoin and blockchain are one and the same, even though they are not. Those who started to realize around 2014 that blockchain could be used for more than cryptocurrency started to invest in and explore how blockchain could alter many different kinds of operations. At its core, blockchain is an open, decentralized ledger that records transactions between two parties in a permanent way without needing third-party authentication. This creates an extremely efficient process and one people predict will dramatically reduce the cost of transactions.

When entrepreneurs understood the power of blockchain, there was a surge of investment and discovery to see how blockchain could impact supply chains, healthcare, insurance, transportation, voting, contract management and more. Nearly 15% of financial institutions are currently using blockchain technology.

Vitalik Buterin, co-founder of Ethereum and Bitcoin magazine, was also an initial contributor to the Bitcoin codebase, but became frustrated around 2013 with its programming limitations and pushed for a malleable blockchain. Met with resistance from the Bitcoin community, Buterin set out to build the second public blockchain called Ethereum. The largest difference between the two is that Ethereum can record other assets such as loans or contracts, not just currency. Ethereum launched in 2015 and can be used to build “smart contracts”—those that can automatically process based on a set of criteria established in the Ethereum blockchain. This technology has attracted the attention of corporations such as Microsoft, BBVA and UBS who are intrigued by the potential of the smart contract functionality to save time and money.

Transition to Proof of Stake

Currently, blockchain operates on the proof of work concept where an expensive computer calculation or “mining” is done in order to create a block (or a new set of trustless transactions). Currently, when you initiate a transaction, it is bundled into a block. Then miners verify the transactions are legitimate within that block by solving a proof-of-work problem—a very difficult mathematical problem that takes an extraordinary amount of computing power to solve. The first miner to solve the problem gets a reward and then the verified transaction is stored on the blockchain. Ethereum developers are interested in changing to a new consensus system called proof of stake.

Proof of stake has the same goal as proof of work— to validate transactions and achieve consensus in the chain—and it uses an algorithm but with a different process. With proof of stake, the creator of a new block “is chosen in a deterministic way, depending on its wealth, also defined as a stake.” Since in a proof of stake system, there is no block reward, but the miners, known as forgers, get the transaction fees. Proponents of this shift, including Ethereum co-founder Buterin, like proof of stake for the energy and cost savings realized to get to a distributed form of consensus.

Blockchain Scaling on the Horizon

Since currently, every computer in a blockchain network processes every transaction, it can be very slow. A blockchain scaling solution would determine how many computers are necessary to validate every transaction in a way that doesn’t compromise security.

Today, Bitcoin is just one of the several hundred applications that use blockchain technology. It’s been an impressive decade of transformation for blockchain technology and it will be intriguing to see where the next decade takes us.
Different Risk Management Options

- CME Futures and Options – Soft Red Winter and KC Hard Red Winter

- MATIF – French Wheat Futures and Options

- Black Sea Wheat FOB (Platts) and Black Sea Corn FOB (Platts) Futures and Options
• Effective and Efficient Risk Management in the Black Sea Markets
• CME Group is offering cash-settled Black Sea Wheat and Black Sea Corn futures and options contracts to complement our existing suite of Corn, Soft Red Winter (SRW), Hard Red Winter (HRW) Wheat, EU Wheat and Australian Wheat FOB (Platts) contracts. These products, available in one marketplace, represent some of the world’s most important wheat and corn markets.
• The Black Sea Wheat FOB (Platts) and Black Sea Corn FOB (Platts) futures and options contracts track the cash market and will allow firms to manage price exposure to Black Sea wheat and corn markets. The Black Sea Wheat FOB (Platts) contract is based on the Platts Russian Wheat 12.5% Fob Black Sea Deep Water daily price assessment and the Black Sea Corn FOB (Platts) contract is based on the Platts Ukrainian Corn Fob Black Sea daily price assessment.
• Black Sea Wheat and Corn futures and options are available to trade on CME ClearPort as blocks and CME Globex on screen.
• Key Features
  - Financially settled futures and options
  - Minimum 12 calendar months listed to trade
  - Tradeable off-screen on CME ClearPort as blocks, subject to a minimum of five lots
  - Spreading opportunities with other CBOT Grain contracts - cross-margining and capital efficiencies through CME Clearing
Precision Agriculture, Research, and Wheat
• **Yara N-Sensor ALS** mounted on a tractor's canopy – a system that records light reflection of crops, calculates fertilization recommendations and then varies the amount of fertilizer spread.
These three false-color images demonstrate some of the applications of remote sensing in precision farming. The goal of precision farming is to improve farmers’ profits and harvest yields while reducing the negative impacts of farming on the environment that come from over-application of chemicals. The images were acquired by the Daedalus sensor aboard a NASA aircraft flying over the Maricopa Agricultural Center in Arizona. The top image (vegetation density) shows the color variations determined by crop density (also referred to as "Normalized Difference Vegetation Index", or NDVI), where dark blues and greens indicate lush vegetation and reds show areas of bare soil. The middle image (water deficit) is a map of water deficit, derived from the Daedalus’ reflectance and temperature measurements. Greens and blues indicate wet soil and reds are dry soil. The bottom image (crop stress) shows where crops are under serious stress, as is particularly the case in Fields 120 and 119 (indicated by red and yellow pixels). These fields were due to be irrigated the following day. See also Precision Farming (Feature Article on earthobservatory.nasa.gov).
• Pteryx UAV, a civilian UAV for aerial photography and photo mapping with roll-stabilized camera head
PUBLIC RELEASE: 16-AUG-2018

Wheat code finally cracked; wheat genome sequence will bring stronger varieties to farmers

• KANSAS STATE UNIVERSITY
• **Genetic Modification/ GMO**
  - A **genetically modified organism** (GMO) is any organism whose genetic material has been altered using genetic engineering techniques (i.e., a genetically engineered organism). GMOs are used to produce many medications and genetically modified foods and are widely used in scientific research and the production of other goods. The term GMO is very close to the technical legal term, 'living modified organism', defined in the Cartagena Protocol on Biosafety, which regulates international trade in living GMOs (specifically, "any living organism that possesses a novel combination of genetic material obtained through the use of modern biotechnology").
  - A more specifically defined type of GMO is a "transgenic organism." This is an organism whose genetic makeup has been altered by the addition of genetic material from an unrelated organism. This should not be confused with the more general way in which "GMO" is used to classify genetically altered organisms, as typically GMOs are organisms whose genetic makeup has been altered without the addition of genetic material from an unrelated organism.

• **Gene Editing / CRISPR**
  - Gene editing, or genome editing, is a new type of genetic engineering that is revolutionizing human medicine and agriculture. These techniques give scientists the ability to more precisely modify the genome of almost any organism. Scientists can pinpoint and remove genes that cause rare diseases in humans or insert desired traits like drought and disease-resistance already found elsewhere in a plant species.
  - Although gene editing can involve transgenics—the moving of genes from one species to another—it usually does not, diminishing the criticism from some anti-biotechnology experts who believe transgenics violate the 'natural order'.

• **Gene Therapy**

• **Synthetic Biology**
  - New Life Forms

• **Epigenetics**
  - Epigenetics is akin to “directing”—it orchestrates how genes work, which shapes the behavior of all organisms. It also describes heritable changes in gene expression that do not involve changes to the underlying DNA—a change in phenotype without a change in genotype—which in turn affects how cells read the genes.
Corn Objective Yield Region
Ears Per Acre vs. Implied Ear Weight

Implied Ear Weight = (Published Yield * 56) / Ears
Relative Soybean and Wheat Yields

- US wheat
- US soybean

Data source: McDonald Pelz, US Wheat Associates, North Asia Marketing Conference
1997 – North Dakota sows 1.2 Mil Acres
0.5 Mil Hectares
2017 – North Dakota sows 7.2 Mil Acres
2.7 Mil Hectares

1997 – US sows 70.85 Mil Acres
28.7 Mil Hectares
2017 – US sows 89.5 Mil Acres
36.2 Mil Hectares
Winter Wheat Planted Area in Kansas, USA
(millions of acres; smallest 5 areas highlighted)

Data source: USDA/NASS
US Wheat Associates
North Asia Marketing Conference

CME Soybean Futures minus CME Soft Wheat Futures
• **Salt-tolerant wheat can grow in difficult soil, ensure food security in changing climate**  
  — Reuters | February 19, 2015

• Researchers in Australia have developed a form of salt-tolerant wheat that could help address the global food crisis by allowing farmers to grow crops in soil with high salinity. They created the new form of wheat by crossing a modern strain with an ancient species, a pairing that resulted in a hearty new kind of plant that can withstand soil that most commercial forms of wheat can’t survive in.

• The wheat was developed using non-genetically modified crop breeding techniques — think good old fashion genetics, no DNA splitting involved — and was revealed in an article in the journal Nature Biotechnology. The research was completed by a team at the University of Adelaide in Australia and the group says they are the first in the world to prove the development of a salt-tolerant agricultural crop. “This work is significant as salinity already affects over 20 percent of the world’s agricultural soils, and salinity poses an increasing threat to food production due to climate change,” said Dr Rana Munns, one of the researchers in the project.

• Most plants have no salt tolerance and thus rising sea levels could spell disaster for global crops. As the global ice caps melt and sea levels rise, salty sea water mixes with fresh water sources on land and seeps into soil causing plants normally grown there to perish. The researchers are now working to use their breeding process to develop a salt-tolerant strain of bread wheat.
‘Super yield’ GMO wheat gets green light for field trials in UK over critics’ objections

Matt McGrath | BBC | February 2, 2017

The GM wheat has been engineered to use sunlight more efficiently and has boosted greenhouse yields by up to 40%. Researchers in Hertfordshire now want to see if they can replicate these gains in the field.

Several GM trials of crops have taken place in the UK over the past 20 years, often attracting protesters who have attempted to destroy the plants. Even when trials managed to avoid disruption, they have not always been scientifically successful.

Last Autumn, the scientists at Rothamsted Research submitted an application to the Department of the Environment, Food and Rural Affairs (Defra) seeking permission to carry out small field trials at a secure site near Harpenden between 2017 and 2019. After an independent risk assessment and a public consultation, that permission has now been granted. The researchers say they want to test newly developed wheat plants that have been modified to carry a gene from a wild relative called stiff brome.

But the planned planting is not without its critics. Around 30 green organisations lodged objections to the plan, pointing to concerns about the potential for the GM wheat to escape into the wild, as has repeatedly happened in the US. Campaigners say they are “disappointed” that the trial is now going ahead.

Read full, original post: New ‘super yield’ GM wheat trial gets go-ahead
Wheat stocks-to-use in major exporting countries

*Top exporters including Russia, Canada, Ukraine, United States, Australia, European Union, Kazakhstan, Argentina, which will account for 90% of exports in 2018/19. Uses Former Soviet Union data prior to 1997 and EU-15 plus Hungary and Romania to approximate EU-28 prior to 1999.
McDonald Pelz Global Commodities LLC

• A global, physical agricultural commodity brokerage firm with offices in the US, Brazil, Argentina, Turkey, Australia, China and India, Singapore and Germany, we work with clients throughout the supply chain, providing superior customer service and thoughtful analysis of the markets.

- 6720 W 121st Street, Suite 102, Overland Park, Kansas 66209 Phone: (913) 491-3711
- 1803 S Foothills Hwy., Suite P, Boulder, Colorado 80303 Phone: (303) 543-7033
- 7076 E Fish Lake Road, Maple Grove, MN 55311 Phone: (612) 259-1024
- 1483 CR 1300NE, Sullivan, IL 61951 Phone: (217) 503-4455
- 125 S Clarke St, Level 17, Chicago, IL 60606 Phone: (646) 250-0068

- Email: mcdonald@mcdonaldpelz.com
- Email: bobby@mcdonaldpelz.com
- Email: pmattson@mcdonaldpelz.com
- Email: kunhs@mcdonaldpelz.com
- Email: award@mcdonaldpelz.com

- Affiliated offices:
  - 53 Belmont Crescent, Montmorency Victoria 3094, Australia Phone: +61394310133
  - R. Jesuino Maciel #255, Campo Belo, Sao Paulo, Brasil CEP 04515-001 Phone: +55 21 5096 1866
  - Av. Libertador 8540 Apt 15 B- Capital Federal- Buenos Aires- Argentina Phone: +54115778 0069
  - Kosuyolu Mh. Mahmut Yesari Sok. No. 10, Kadikoy, Istanbul, Turkey
  - Office 111, Centrum Plaza, Sector 53, Golf Course Rd, Gurgaon-12 2001 India
  - Rm 406 Fuxing Commercial Bldg, 139 Ruijin Rd #1, Huangpu Distr, Shanghai, China 200020
  - 17 McNair Road, Singapore, Singapore
  - Hamburg, Germany

- Email: pgeary@mcdonaldpelz.com
- Email: rwerebe@mcdonaldpelz.com
- Email: drodriguez@mcdonaldpelzargentina.com
- Email: c.sonmez@mcdonaldpelz.com
- Email: sumit@mcdonaldpelz.com
- Email: eduardo@mcdonaldpelz.com
- Email: kelvin@mcdonaldpelz.com
- Email: thomas@mcdonaldpelz.com

THANK YOU