

The logo for AgReview, featuring a stylized 'A' composed of two overlapping crescent shapes, one blue and one green, followed by the word 'AgReview' in a blue serif font.

AgReview

August 2016

Volume 28, No. 7

World Perspectives, Inc.

An underwater photograph of several large fish, likely salmon, swimming in clear, blue-green water. The fish are silhouetted against the light, and the water is filled with small bubbles.

The Aquaculture Juggernaut

Farmed Fish and World Peace

Seafood Mislabeling & Vietnam

Second-Most Important Aquaculture Species

Commodity Market Review

WORLD PERSPECTIVES: AG REVIEW

If you would like to receive *World Perspectives: Ag Review* in PDF format via email, please send your name, organization name and e-mail address to: wpi@agrilink.com.

Editor: Coleen Blumenthal

Cover Design: Renee Boudreau, Studio Del Ray

Cover Photo: Tony Grover (<https://www.flickr.com/creativecommons>)

For more information about WPI and its information services, including subscriptions for *World Perspectives: Ag Review*, please contact us via email at [**wpi@agrilink.com**](mailto:wpi@agrilink.com) or mail your request to:

World Perspectives, Inc.
1901 N. Fort Myer Drive
Suite 1015
Arlington, VA 22209 USA

Copyright ©2016 World Perspectives, Inc. World Perspectives, Inc., 1901 N. Fort Myer Drive, Suite 1015, Arlington, VA 22209. Telephone: 202-785-3345. Email: wpi@agrilink.com. Web: www.worldperspectives.com.

The information contained herein has been obtained from sources believed reliable but is not necessarily complete and cannot be guaranteed. Any opinions expressed are subject to change without notice. Reproduction of any portion of this report is strictly prohibited without permission of World Perspectives, Inc.

How can WPI's consulting services help your business succeed?

Consumer Research: WPI produces low-cost, non-probability consumer surveys around the world. When overlaid with conventional market research data, the result is insights into where and how markets for agrifood products can be expanded – and we have the results to prove it.

Market Identification: Conventional use of macroeconomic and demographic data has correlative value in identifying new markets, but WPI digs deeper. The result has been unique recommendations with some netting a return ratio of 6:1 for increased exports and promotional investment.

Investment Analysis: WPI has provided due diligence on agrifood investments in disparate parts of the world from dairy and juice packaging in Cameroon to soybean crushing in Ukraine and biotech corn planting in Canada. In other instances, the company has used its decades of risk management experience to caution enthusiastic but new-to-agriculture investors to be prudent.

What do our clients say about our services?

- *Any company that follows up like WPI deserves our business.*
- *WPI does an excellent job of working to assess the client's needs and tailoring their methodologies accordingly.*
- *WPI is very responsive in addressing any questions we have; they are helping the association gauge how to move forward with effective strategies in international markets. This year they have increased the level of their services and continue to help us find ways to be effective with our strategies.*
 - *WPI has been responsive and cooperative under every challenge and circumstance presented in their work for us.*
 - *WPI really provides us with a life-blood service.*

Please contact David Gregg, Consulting Projects Manager, at (503) 467-8668 or dgregg@agrilink.com for more information about how WPI's consulting services can work for you.

CONTENTS

THE AQUACULTURE JUGGERNAUT.....	1
Despite efforts by antagonists to end fish farming, its efficiency will keep it the dominant animal protein production methodology.	
FARMED FISH AND WORLD PEACE.....	4
Tension between wild-caught fish supply and demand is causing territorial conflict in Southeast Asia and could potentially create civil unrest elsewhere. Aquaculture is positioned to balance economic and environmental factors and help maintain world peace.	
WILL SEAFOOD MISLABELING IN THE U.S. HELP VIETNAM'S AQUACULTURE INDUSTRY?.....	9
Seafood mislabeling has led to tougher standards for imports into the U.S. as well as new traceability and sustainability standards from exporting countries, including Vietnam.	
TILAPIA – THE SECOND-MOST IMPORTANT AQUACULTURE SPECIES.....	11
As the world has increasingly turned to aquaculture to meet its seafood demand, tilapia has become the second-largest farm-raised fish. Just as important, tilapia feeds contain a high level of soymeal, which is beneficial to the soybean industry.	
COMMODITY MARKET REVIEW.....	14
Commodity markets continued their bearish trends in July as funds liquidated long positions and good weather boosted U.S. corn and soybeans crop ratings. Meanwhile, U.S. export opportunities are being bolstered by several factors.	

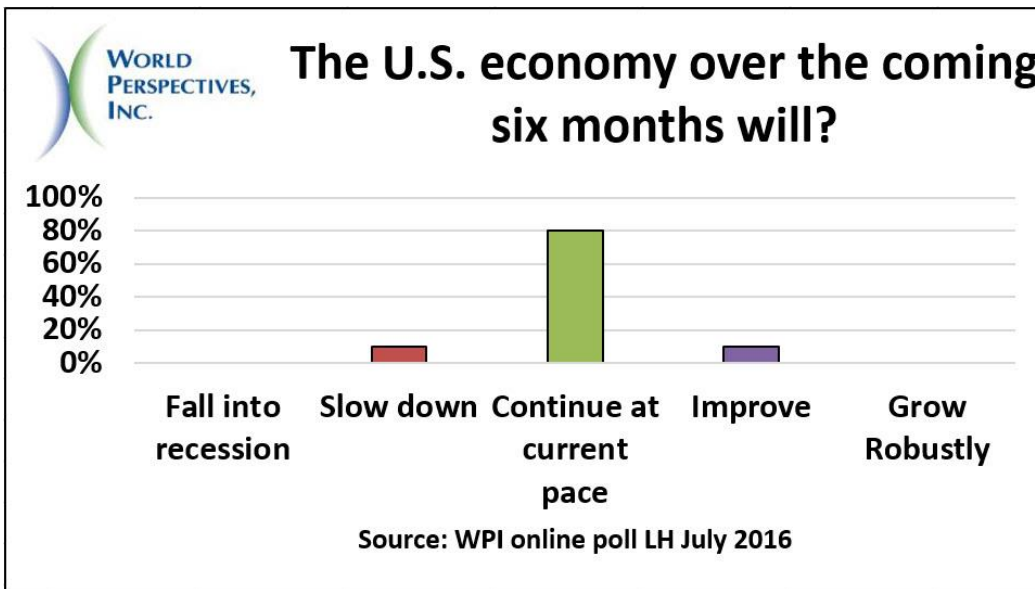
“Character, in the long run, is the decisive factor in the life of an individual and of nations alike.

— *Theodore Roosevelt*

<i>HARVESTED DATA</i>	
Food Matters	
Sweet Choice	<p>Given a choice of several flavors of ice cream, 20 percent chose vanilla with 17 percent preferring chocolate, although 16 percent indicated all choices. Another 8 percent opted for cookies and cream, and 6 percent picked cookie dough.</p> <p style="text-align: right;">BestFoodFacts.org</p>
Source Factor	<p>36 percent of adults polled said buying locally-sourced ingredients was very important versus 32 percent who considered purchasing organic or natural ingredients to be most critical; 26 percent responded that buying foods with multicultural flavor was as important as purchasing from a company with a strong social purpose.</p> <p style="text-align: right;">Harris Poll</p>
Farming Decision	
State of the Field	<p>Nearly 50 percent of poll participants said that their fields are okay right now with no further action required, but 24 percent indicated they will take prevented planting coverage. Meanwhile, 14 percent either replanted or will do so, and 12 percent are still deciding whether they need to take any action.</p> <p style="text-align: right;">AgWeb Poll</p>
Ag Future	
Tools of the Trade	<p>When asked what will play the biggest role in the future of agriculture, 21 percent of respondents said big data and another 21 percent indicated collaboration. These were followed by biotech and precision tech at 17 percent each.</p> <p style="text-align: right;">Zimm Poll</p>

WPI POLLING

Below is the result of a recent WPI poll. Visit www.worldperspectives.com to cast your vote in our current survey.



THE AQUACULTURE JUGGERNAUT

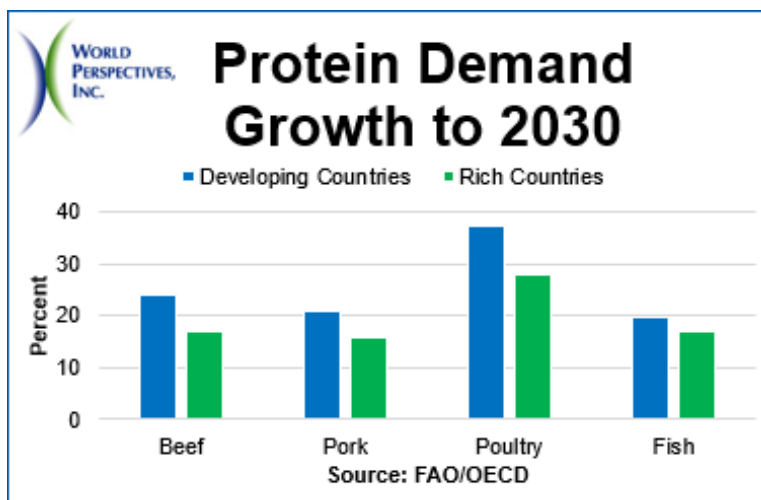
By Gary Blumenthal

Consumers have been willing to pay a premium for wild-caught fish under the impression that it is healthier, better tasting and less damaging to the environment. These myths have been promoted by environmental groups that are philosophically opposed to “factory” fish farming. Their depictions of farmed fish usually involve welfare (stressful over-crowding), chemicals (antibiotics, pesticides), the spread of diseases, genetic pollution, lower nutrition (more bad fat, less omega-3), etc. Not only are these disparagements

an exaggeration or outright wrong, but they work to worsen the rapid decline in wild fish species.

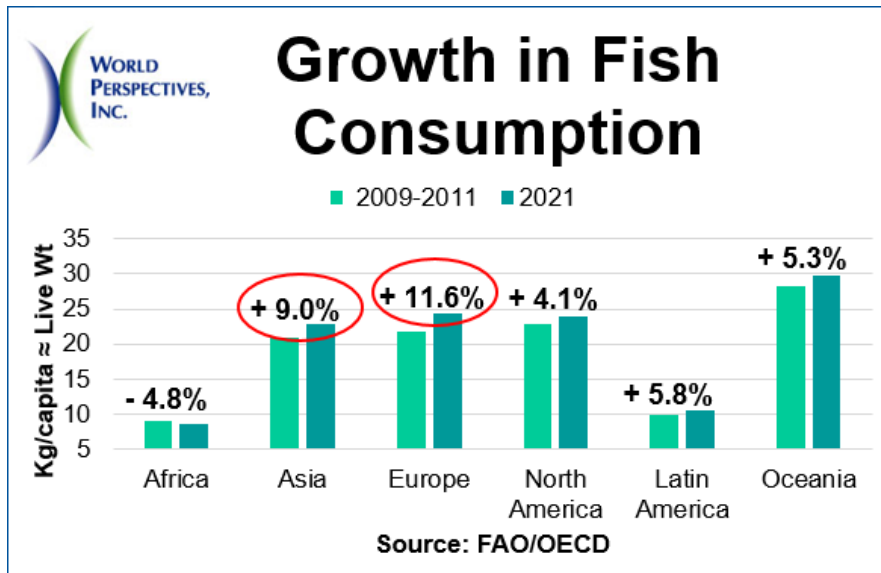
Unquenchable Demand

Despite the efforts by activists to convert humans over to vegetarianism, projections for animal protein demand remain robust (see graph below). Food technologists continue offering meat alternatives, but the demand for real meat remains tightly correlated to the growth in population and per capita income.



As an animal protein, the demand for fish has been increasing at a rate too high for the natural stocking systems of the world’s oceans (see following graph). As a result, the UN’s Food & Agriculture Organization (FAO) estimates that

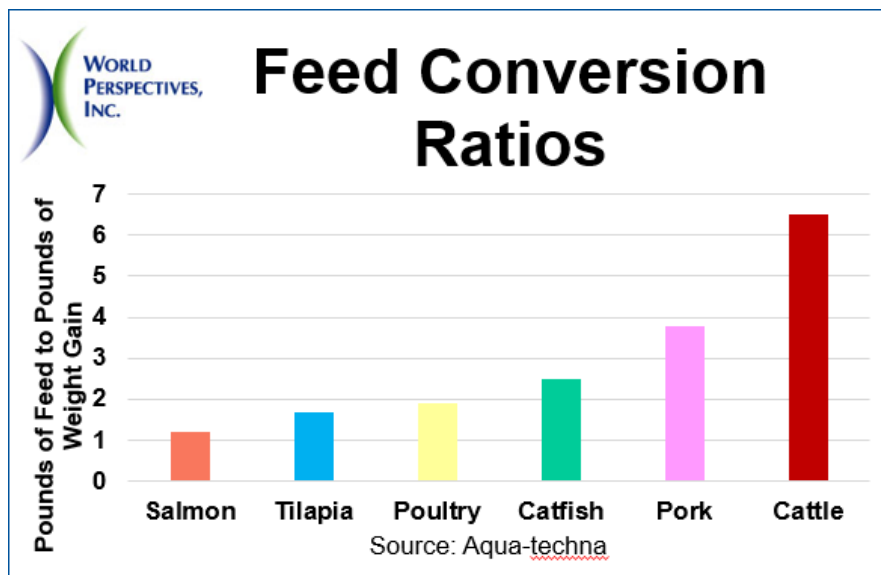
70 percent of the world’s fish population is now fully used, overused or in crisis. This means that the second-deadliest job for humans, commercial fishing, will also be the death knell of entire species.



Advantage – Farmed Fish

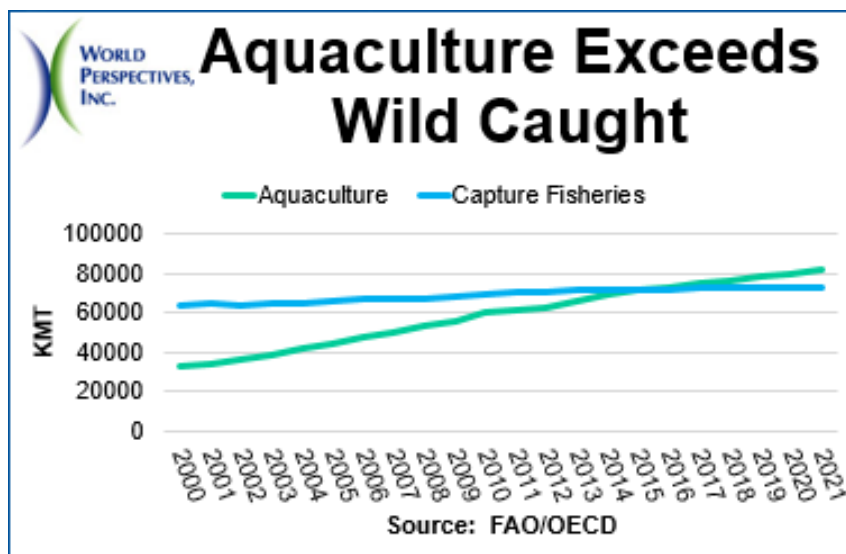
In terms of production efficiency, no animal protein comes closer to perfection than fish (see graph below). Tests on some salmonids have

shown a 1:1 feed conversion ratio (FCR), meaning each pound of feed results in a pound of growth by the fish. The FCR for catfish could be greatly improved with better production practices.



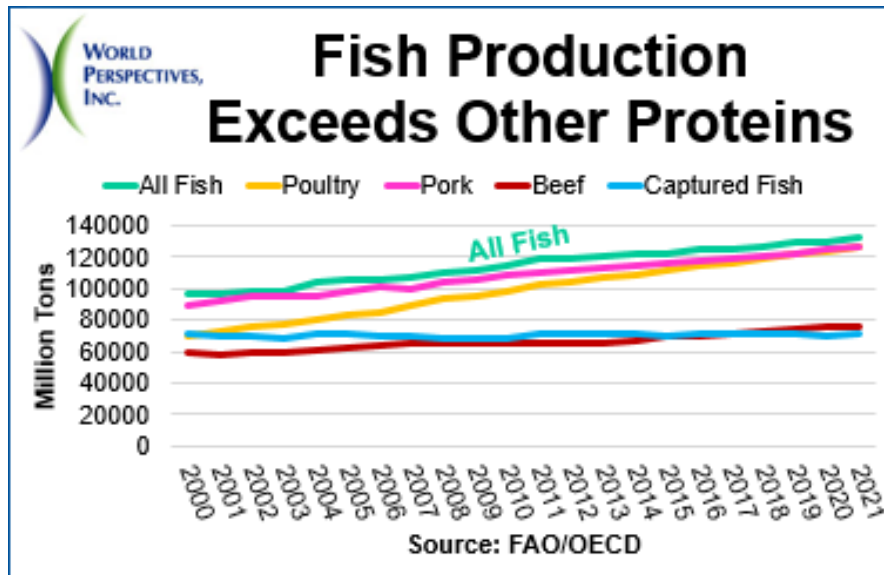
Given the increasing demand for fish, the loss of wild species and the advantageous FCR, it is no wonder that the production of farmed fish now

exceeds the volume of wild-caught fish (see following graph). Those are dynamics that even the most persistent scaremongering by antagonists cannot overcome.



At over 60 MMT of production each year, China is by far the largest single producer of farmed fish. In fact, its production exceeds that of the next six largest aquaculture producers (India, Vietnam, Norway, Indonesia, Chile and Japan) combined. China's seafood imports now also outpace its exports.

While poultry production has been gaining and passing the production totals of most other animal proteins, it seems unlikely that it will ever surpass the production of fish (see graph below).



The realities of this world have predicated the rise of global aquaculture. Fish farms are allowing the world to balance growing protein demand with environmental responsibilities. Aquaculture's detractors need to realize the unsustainability of

their position while consumers should arm themselves with facts. Wild-caught fish will increasingly play the role of a luxury food item, leaving many consumers and activists with the choice of eating farm-raised fish or none at all.

FARMED FISH AND WORLD PEACE

By Matt Herrington

Food production is a universal strategic priority. But what happens when strategically important foods are subject to overexploitation by other nations or produced in areas subject to territorial conflict? The world's fisheries are in such a state right now. Many countries have cultural or economic significance tied to fishing, but global production is steady if not declining and many fisheries around the world are exploited or depleted. This has led countries to expand their fishing territory, often into areas where other nations have claimed traditional fishing rights, leading to strained international relations and mild conflict. Aquaculture is uniquely positioned to arbitrage the difference between global demand and wild-caught seafood supplies and, in doing so, prevent civil unrest and international conflict.

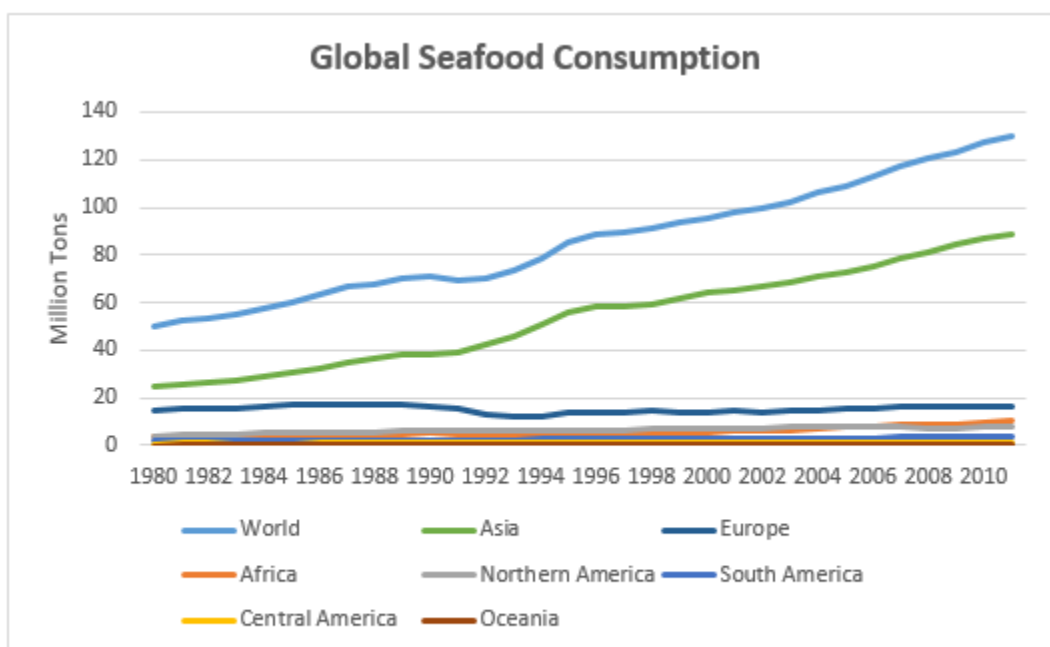
The Supply Situation

Global capture fish production has been stagnant for decades. According to the UN FAO, it has fluctuated near 90 MMT annually since 1990. The FAO's *Fish to 2030* report forecasts global capture production to remain nearly constant, modestly rising to near 93 MMT by 2030. Despite nearly constant capture production levels, overfishing is a serious concern for many of the world's ocean fisheries. In 2011, 57.4 percent of global fish stocks were fully exploited or at their maximum sustainable production, according to the FAO.

The overfished and exploited state of the many fisheries around the world has led to changing fishing tactics. Depleted fish stocks have led to an increase in deep sea fishing, a move away from traditional shore-fishing activities. This tactical shift is clearly represented in one Southeast Asia nation: China. 90 percent of its fishing was conducted along or near the shore in 1985 before dropping to only 65 percent by 2002. During that time period, China increased its long distance and deep sea fishing fleet to maintain and expand its capture fish production. This trend is not isolated to China alone, however, and countries around the globe have adopted similar measures to maintain supplies.

Seafood Demand is Growing

Juxtaposed against stagnant capture fish production is the world's rising population, income and seafood demand. The current global population of 7.3 billion is forecast to reach 9.7 billion by 2050 with much of the increase coming from the world's least developed and developing nations. Population growth and economic development in these countries will drive demand for protein in human diets, particularly in areas where fish is historically and culturally important like China, Southeast Asia, India, coastal Africa and others. Many of these regions are expected to see sizable population growth in the future. Accordingly, demand for fish will probably continue its dramatic expansion in the future, and it is likely to retain its importance as a staple item for many cultures.



Source: UN FAO, WPI

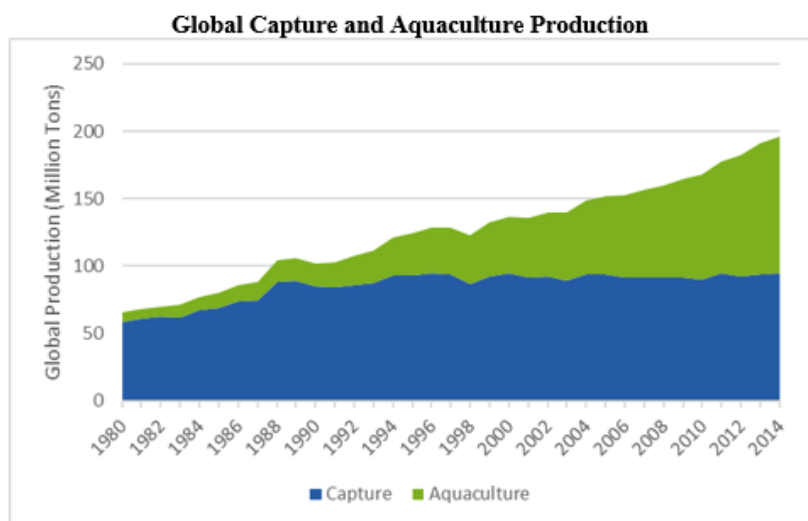
Note: Consumption is estimated as supplies available for food use.

Beyond the sheer increase in bodies occupying the world's land mass, seafood demand is growing as rising incomes in wealthy countries expand. In the U.S., for example, seafood consumption has been increasing rather steadily over the past 60 years, although it has recently plateaued. Imported fish like tilapia that are marketed at the low end of the seafood price range have been wildly popular and expanded general seafood consumption. Additionally, people have been shifting consumption to higher value products such as crabs, lobster, scallops, etc. as incomes rise and luxury seafood items become more attainable.

Aquaculture's Current State

To date, aquaculture has filled the gap between the world's growing demand for seafood and its over-fished oceans. Indeed, growth in fish production – due almost entirely to aquaculture - has surpassed the human population growth rate over the past five decades¹. Aquaculture production has achieved this metric by growing at an 8 percent compound annual growth rate (CAGR) from 1980 to 2014. In contrast, the world's capture fishery production grew at a meager 1 percent CAGR over the same period.

¹ UN FAO. 2016. *The State of World Fisheries and Aquaculture*. Available here: <http://www.fao.org/3/a-i5555e.pdf>.



Going forward, it will be important that aquaculture continues to fill the gap between rising global consumption and steady-to-declining capture fishery production. Ocean fisheries have maintained stable stocks levels due partly to aquaculture's role in easing demand on capture fishing supplies. In many ways, the health of the world's ocean fisheries depends upon the continued success of aquaculture.

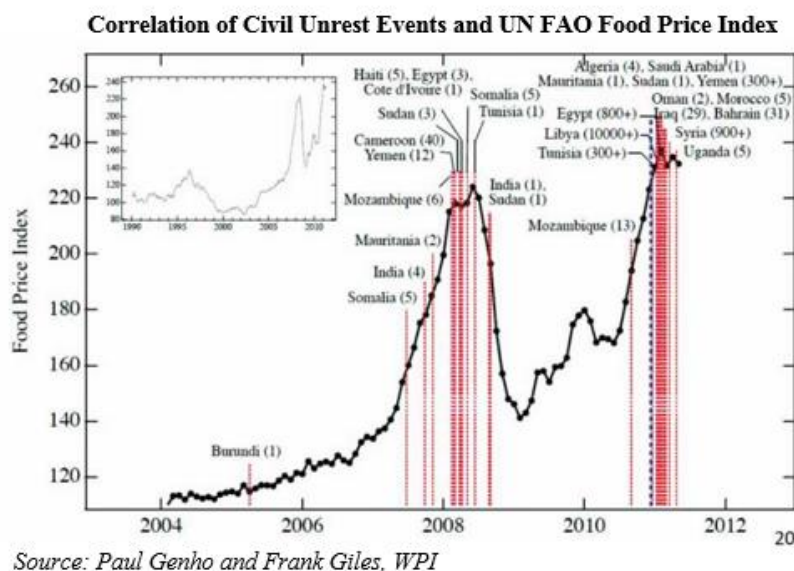
Food Shortages Lead to Civil Unrest

In economics, when demand exceeds supply for a good or basket of goods, prices rise. When this phenomenon occurs for staple food items, it often creates food insecurity² for many of the world's poor, especially those in developing nations. History has shown widespread food insecurity throughout a nation or region often leads to civil unrest and, at worst, violent conflict (civil or international war). During the global food price spike of 2007-2008, UN data shows riots and civil unrest broke out in 48 countries across the globe (see following chart).

² Defined as the inability to obtain physical, social, and economic access to sufficient safe and nutritious

food that meets dietary needs. *International Food Policy Research Institute*, 2016.

<https://www.ifpri.org/topic/food-security>



The link between food insecurity and/or production shortfalls has multiple historic examples as well. Hillgruber³ argued that Nazi Germany's aggression toward Poland and Eastern Europe was partly motivated by desire to acquire *lebensraum* ("living space") as was Japan's invasion of China and Indochina (Natsios and Dolley⁴). Other research showed historic correlations indicating countries sharing river basins are three times more likely to engage in interstate war than are those that border one another (Toset et al.⁵; Gleditsch et al.⁶). These relationships tend to be the strongest for countries with poor economic development.

Of course, high food prices do not necessarily mean civil unrest will follow. Indeed, Brinkman and Hendrix⁷ argue the correlation between food insecurity and conflict is strongest for civil unrest within "fragile states" (countries with less stable governments) and weakest for interstate conflict.

Fish Wars in the Pacific

The global seafood supply/demand situation, coupled with the historic relationships between food insecurity and civil unrest, opens the door for future domestic or international conflicts. These may arise primarily from two issues: 1) civilian pressure on governments to fix local or national supply shortages, and 2) nations' continuing expansion of long-distance fishing fleets into international waters or neighboring countries' territories. The latter, while unlikely to cause significant global conflict, will probably strain relations between larger nations and may cause outright conflict between smaller ones.

As observed in the 2011 Arab Spring conflicts, localized civil unrest is most likely within nations with semi-stable governments and developing economies. Particularly at-risk countries include Mozambique where the expanding population

³ Hillgruber, A. 1981. *Germany and the Two World Wars*. Cambridge, Harvard University Press.

⁴ Natsios, A.S. and Dolley, K.W. 2009. The Coming Food Coups. *The Washington Quarterly*, 32(10): 7-25.

⁵ Toset, H.P.W., Gleditsch, N.P., and Hegre, H. 2000. Shared Rivers and Interstate Conflict. *Political Geography*, 19(8): 971-996.

⁶ Gleditsch, N.P., Furlong, K., Hegre, H., Lacina, B., and Owen, T. 2006. Conflicts over Shared Rivers:

Resource Scarcity of Fuzzy Boundaries? *Political Geography*, 25(4): 361-382.

⁷ Brinkman, H., and C.S. Hendrix. 2011. *Food Insecurity and Violent Conflict: Causes, Consequences, and Addressing the Challenges*. Available here:

http://documents.wfp.org/stellent/groups/public/documents/newsroom/wfp238358.pdf?_ga=1.192776234.1806503731.1469470710

and overfished-to-depleted state of 88 percent of the nation's fisheries are expected to *reduce per capita availability of protein by 70 percent* in 2030. Similarly, countries like the Philippines, which relies on fish for more than 15 percent of its protein intake, Cambodia, Indonesia and Malaysia are at greater risk for domestic turmoil in the face of declining seafood availability.

The most prominent examples to date of international conflict arising from countries expanding their long-range fishing capabilities have been in the South China Sea where there were fourteen incidents in disputed waters between 2000 and 2015. Each of these occurrences heightened international tensions and involved confrontations with rival nations' coast guards, arrests and detainment of ships' crews or the confiscation and scuttling of vessels. Tensions have long been escalating in the South China Sea due to severely depleted marine resources in the region and as territorial boundary claims often overlap. Maritime patrols in the area are infrequent, and the absence of strong regulation and enforcement provides little incentive to honor murky territorial claims. The territorial rivalries and sporadic conflict over fishing territory and marine resources will likely increase without additional seafood production. The story of the world's fisheries is a classic example of the tragedy of the commons, which history has proven often leads to the tragedy of conflict.

Aquaculture: The Giver of Peace?

The outlook for global fisheries and civil unrest is bleak indeed without aquaculture, but it becomes markedly improved when fish farming is included. Aquaculture can continue to fill the gap between supply and demand while providing food security for seafood-dependent nations. It is uniquely positioned to thrive, driven by market fundamentals and likely strategic investments by nations across the globe. Countries with populations dependent (from a food security, economic or cultural standpoint) on fish and seafood have strong incentives to invest in aquaculture to feed their populations.

Aquaculture alone may not end fishing excursions into disputed or rival countries' fishing territories. International diplomacy and negotiations will likely be the final arbiter of these conflicts, but aquaculture can reduce the need for diplomatically-risky fishing trips by changing market fundamentals. One might argue aquaculture has already partially done so.

Future growth in the world's aquaculture capacity and production is a near certainty. The industry is uniquely positioned to meet economic, social and strategic needs. As this hierarchy of needs is filled, aquaculture may play a prominent role in preventing civil and international conflict that would otherwise occur. Perhaps the old adage should be amended: "If you give a man a fish, you feed him for a day. Teach him how to farm fish, and you further world peace."

WILL SEAFOOD MISLABELING IN U.S. HELP VIETNAM'S AQUACULTURE INDUSTRY?

By Dave Juday

Mislabeled fish and seafood has gained widespread media attention over the past few years. According to *Bait and Switch*, a 2013 report produced by the consumer watchdog group Oceana, "...consumers are frequently served the wrong fish — a completely different species than the one they paid for. Recent studies have found that seafood may be mislabeled as often as 25 to 70 percent of the time for fish like red snapper, wild salmon and Atlantic cod, disguising species that are less desirable, cheaper or more readily available."

Oceana also conducted a study last year focused on salmon, finding 40 percent of the samples were mislabeled. It noted that imported, farm-raised salmon is typically passed off as being U.S. wild-caught in order to inflate retail prices. The study also found the problem was more pronounced in food service than in grocery stores with restaurant diners five times more likely to encounter mislabeled or misrepresented salmon. Interestingly, the occurrence of mislabeling was lowest in major grocery store chains and highest, predictably, when wild-caught salmon was out of season.

The structure of the fish and seafood sector is particularly susceptible to fraud. Consumption of its products was on the rise beginning in the early 2000s, peaking at 16.5 pounds per capita in 2006 when much of the suspected fraud increased. The growing demand also pushed up prices and thus provided an incentive for mislabeling lower-priced fish and seafood. Furthermore, over 80 percent of seafood is now imported, and fish processing, which turns whole fish into fillets, makes it almost impossible for agencies to detect

the fraud without DNA testing. In response to claims of mislabeling, the U.S. Food and Drug Administration (FDA) is currently testing seafood for mislabeling under Import Alert 16-04 (seafood) and Import Alert 12-128 (catfish). It is also expanding that testing domestically under the new Food Safety and Modernization Act. Just last month, the FDA issued an alert that imported products identified as red snapper, orange roughy and king crab meat were, in fact, mislabeled. In addition, it categorized 15 new fish and seafood names such as salmon trout, Argentina roughy, white ruffy, scampi, European walleye, black cod, and white fish (as opposed to whitefish) as "fictitious."

Mislabeling is a form of economic fraud that can cause consumer dissatisfaction and even be a source of food safety threats as seafood allergies are common. After the exposure of the fraud practices, consumption has dropped about two pounds per capita or more than 12 percent and remains at that level. Other factors may also be contributing to the decline, but mislabeling concerns are certainly not helping reverse the trend.

Developing Traceability Systems

As noted above, about 80 percent of the fish and seafood consumed in the U.S. is imported. The exporting countries, especially those with aquaculture-based systems, face significant hurdles in establishing traceability. Their supply chains in terms of aquaculture products are not integrated and instead are composed of small-scale operators ranging from independent hatcheries, feed mills, farmers and brokers to transport providers. Accordingly, most exporting

countries rely on central markets or buying points to aggregate aquaculture products from various producers and brokers, making traceability difficult. This results in mixing loads and products from different feeding practices and systems. Moreover, recordkeeping, a key component of any traceability system, usually entails the need to hire more manpower to establish and maintain that type of operation. This of course requires additional capital that small-scale stakeholders may lack.

Progress in traceability has been made, however, due to more stringent importing country requirements. U.S. efforts to test more imported fish and seafood together with the EU's implementation of basic traceability standards have forced many exporting countries to develop new guidelines of their own.

Vietnam Improving Its Value Proposition

One of the leaders in developing new traceability standards is a producer/exporter that has faced significant difficulties maintaining its U.S. market – Vietnam. Its traceability system applies not only to fisheries production but to all segments in the supply chain, including feed, chemicals, products for treatment and improvement of the environment, seedstock, nursery and rearing. The specific requirements include:

- Keeping records for one step back and one step forward, much like the recordkeeping requirement imposed on food facilities under the Bioterrorism Act of 2002 in the U.S.
- Organizing information to provide for the identification of production, receipt, supplier, and delivery by lots
- Maintaining identification codes on wholesale-to-retail product labeling

Producers, specifically, must maintain records on receipt and delivery of inputs, handling of hazardous or expired products, movement of

aquatic animals, contemporaneous conditions of each pond used in production, treatment of any disease, and all harvest and buyer information. These records must be kept for 24 months. Vietnam is also incorporating sustainability measures into its production systems and gaining certification from international non-governmental organizations on sustainability as well as increasingly positioning itself as the gold standard for sustainable aquaculture. In August 2015 alone, Vietnam enrolled 25,000 hectares (61,776 acres) of *pangasius* (a fish similar to tilapia) ponds in the traceability program. Comparatively, the U.S. had a total of 62,540 acres of catfish production as of 1 January 2016, according to USDA.

Vietnamese pangasius competes with domestic catfish and Chinese tilapia in the U.S. market. In 2003, Congress passed a statute preventing it from being labeled as catfish in the U.S. and imposed a tariff on imports. Both fish are of the siluriformes order, but the distinction is in the genus identification with U.S. catfish considered part of the Ictaluridae genus. However, the 2008 and 2014 Farm Bills transferred inspection of catfish (including pangasius) to USDA's Food Safety Inspection Service; full enforcement of the new inspection procedure will commence 1 September 2017 after an 18-month transition period that began 1 March of this year. While this allows pangasius and other siluriformes to be labeled catfish, it increases the cost of regulatory compliance with the new inspection requirement.

The Vietnamese Pangasius Association notes that its own internal problems have led to a reduction in exports to the U.S., and the group recognizes that competing on price alone has not kept the industry up to date in securing an expanding market. New quality assurances and traceability may help the industry to start to improve its reputation and market share, especially if the new costly inspection system is scrapped. The U.S. Senate voted to abandon the system in the FY 2017 appropriations bill; the final appropriations bills will likely be passed in a lame-duck session of Congress after the November elections.

TILAPIA – THE SECOND-MOST IMPORTANT AQUACULTURE SPECIES

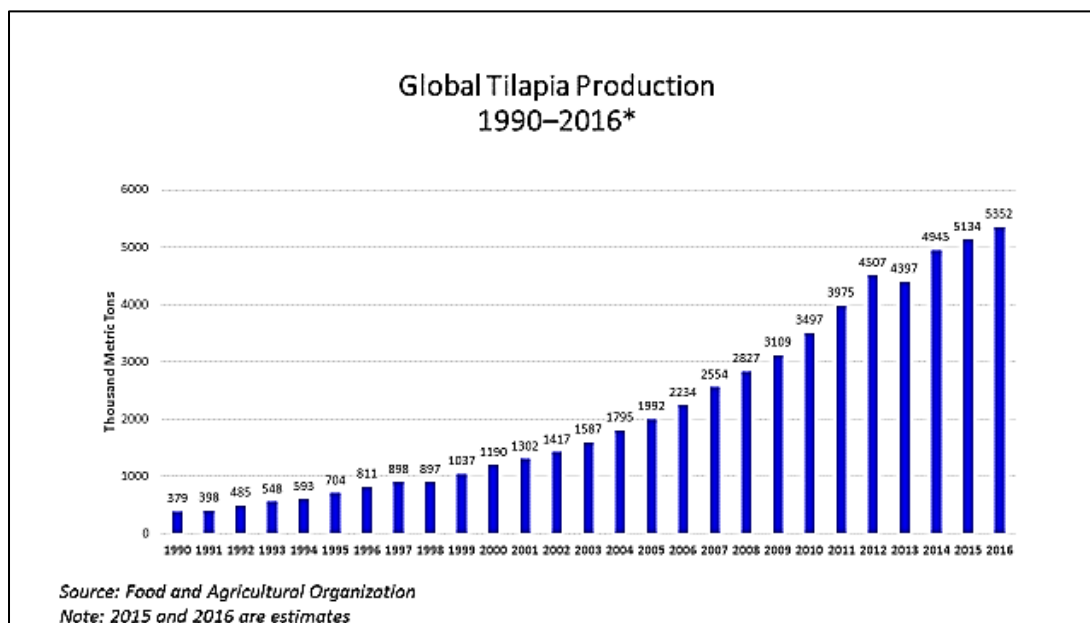
By John Baize

The global aquaculture sector is large and quickly expanding as a result of growing demand for seafood and little capability to expand capture fish production. It is increasingly clear that only by boosting production via aquaculture can the world's future seafood demand be met.

Carp, the top farm-raised fish, is the most commonly recognized aquaculture species, along with salmon, trout and catfish. However, the second-most important species today is tilapia, a freshwater fish native to the Nile River and elsewhere in Africa. Tilapia is an ideal fish for aquaculture because it is vegetarian, has high feed conversion ratios and produces a high quality, dense white meat with mild flavors. It is also inexpensive to produce and has no known religious objections to its consumption.

Wild tilapia has been consumed in Egypt for thousands of years. A hieroglyphic symbol for it is common on the walls of Egyptian tombs. There are at least three main subspecies of tilapia, but those produced today are much different from the native ones after years of selection. In fact, some are hybrids of the subspecies. They can exist in the wild only in tropical climates where the water remains warm year-round. The fish does not do well in brackish water.

It is estimated that global tilapia production in 2016 will be about 5.32 MMT, approximately 4.2 percent more than the 5.1 MMT in 2015 and 8 percent higher than the almost 5 MMT in 2014. It is difficult to obtain more exacting data about world aquaculture production because of the large number of countries where the fish is produced and the fact that there are so many producers. However, industry analysts estimate the global tilapia industry's annual output is worth about \$10 billion.



China is known to be the top tilapia producer with an estimated output of 1.6 MMT in 2015. It is followed by Indonesia and Egypt with projected totals of 940,000 MT and 625,000 MT, respectively, for the same year. The other key producing countries include the Philippines, Mexico, Thailand, Taiwan, Brazil and Honduras. While at least 30 countries do not raise tilapia, the fastest production growth in recent years has occurred in Brazil and Indonesia. Annual U.S. tilapia production is around 14,000 MT.

Tilapia demand has grown rapidly because it is a very desirable fish. The average tilapia weighs about 5.6 pounds with a dressed weight of about 2.5 pounds. It is also somewhat inexpensive. Because tilapia filets are relatively firm, they can be prepared many ways without falling apart when cooked. The weight, price and texture makes it an ideal fish for consumers and restaurants. Additionally, the mild taste is

appreciated by consumers who may not like strongly flavored fish. U.S. consumption of tilapia has grown steadily in recent years with imports totaling 496.1 million pounds (225,027 MT) in 2015. Demand is likely to continue growing in the future.

A positive aspect for American agriculture is that tilapia's vegetarian diet is similar to that of chickens and pigs. Most modern tilapia feeds are comprised of soymeal and corn or wheat. In many cases, the soymeal content of tilapia fingerling and grower rations can approach 50 percent with levels of 35-45 percent quite common in the most sophisticated operations. Very little fishmeal is used except for tilapia fry feeds. However, as more is learned about the dietary requirements of tilapia, that will probably no longer be required in feeds that are properly balanced with synthetic amino acids and other ingredients.

Composition of Tilapia Feeds for Fingerlings and Growers Jiangsu Province, China (Pct.)		
Ingredient	Fingerlings (10-50 grams)	Growout (> 50 grams)
Fishmeal	12%	4%
Soymeal	46%	34%
Wheat Midds	30%	30%
Corn	6.2%	22.1%
Poultry By-Product Meal	-	6%
Vegetable Oil	3.6%	0.5%
Phosphate	1.4%	2.6%
Vitamin & Mineral Premix	0.5%	0.05%
Binder	0.01%	0.01%
Methionine	-	0.01%

Source: Food and Agriculture Organization

The high soymeal content of feeds for tilapia is one reason the U.S. soybean industry made significant investments helping tilapia producers around the world reduce costs by using more of that ingredient. As the global tilapia sector becomes more sophisticated, it is likely the average soymeal content of the feeds will rise.

There is also little reason to believe production will not continue to grow 4-5 percent annually in the future as the world's consumers increasingly must source farm-raised fish for their diets. Tilapia is clearly going to be the chicken of the water.

COMMODITY MARKET REVIEW

By Robert Kohlmeyer

The same factors previously cited here as being responsible at various times and in varying degrees for much of the price action in grain and soybeans futures markets during June also influenced market activity in July. However, the role that each played was not necessarily as had been expected.

The activities of managed money funds – commodity funds and hedge funds – continued to be a major market factor last month. Funds began July carrying huge long positions in CME corn, soybeans and soymeal futures contracts as well as an impressive short position in CME wheat futures. During July, funds sold more than 300,000 corn contracts, which liquidated their long position and left them short about 40,000 corn contracts at month's end. Funds also substantially reduced their long position in both soybean and soymeal futures as well as added somewhat to their short position in the wheat futures market. All of that selling, especially during the second half of the month, contributed to the price weakness in those markets.

Weather during the mid-summer portion of the growing season had the expected effect on futures market price action. One of the reasons funds added to their long positions in corn and soybean futures during the last half of June was that some weather models were projecting a high pressure ridge over the Midwest in early July, bringing with it an extended period of intense heat and very limited rainfall over the Corn Belt, Mid-Atlantic and Southeast. Those conditions appearing when much of the U.S. corn crop would be pollinating would pose a serious risk by significantly lowering yield potential. If drought-like conditions were to extend into August, the soybean crop's yield potential would be similarly threatened.

When traders returned from the Fourth of July holiday, however, they found that the weather models had changed the projected weather pattern to one with only short periods of above-normal temperatures and accompanied by significant rainfall. In light of the revised outlook, funds began to liquidate long futures positions. The price rally generated by the dire weather outlook first projected gave way to a bearish reaction to the improved forecast. The new crop December corn contract price peaked at \$4.49/bushel on 17 June and traded at a daily high of \$4.0675/bushel on 28 June, but it has not even reached \$4 since that time. By 6 July, the same contract traded as low as \$3.46/bushel.

Futures traders have been frustrated by the inconsistencies shown by weather models from one day to the next as well as the frequent lack of agreement between the main models. The market was being dominated by weather, which is hardly unusual for this time of the year, but there developed a great lack of confidence in forecasts of likely weather conditions more than three-four days in advance. As it has developed, July 2016 proved to be one of the warmest on record for the Midwest, but rainfall totals for many reporting stations there were above average for July. This kept soil moisture levels high enough to apparently fend off potential crop damage. Both the corn and soybean crops began July with very high ratings in USDA's weekly crop condition reports, and they ended the month with much the same. Based on those ratings, the two crops are maintaining the potential for record or near-record high yields.

The weather-related problems that resulted in lower-than-expected soybean and corn production in Brazil and Argentina were outlined here last month. During July, it became possible to better measure the actual lost production.

Drought cut back Brazil's winter corn production to the point that its entire crop is at least 8 MMT less than originally expected. Late harvested Brazilian soybean yields also tailed off enough that the final production estimate of 96.5 MMT is down about 4 MMT from earlier estimates. Due to excessive rainfall and flooding when crops were ready to harvest, Argentina's soybean production is down at least 3 MMT from expectations, and its corn crop lost an estimated 2 MMT. Combined corn and soybean production in the two South American countries is down about 17-18 MMT from projections of three months ago. This reduced supply seems likely to be an important factor in world trade flows, particularly in the form of increased U.S. corn and soybean exports in 2016/17.

The vote in favor of Britain exiting the EU (Brexit) came as a shock. All of the late polls showed that voters would favor remaining a member. The shock was sufficient to cause Prime Minister David Cameron, a vocal Remain supporter, to resign. Financial and commodity markets reeled from the results, and for about two days it appeared that predictions that Brexit would be a market disaster might prove true. A week later, however, equity and bond markets had righted themselves, and after two weeks it was hard to tell that Britain voted to leave. The U.S. dollar did retain some lingering strength against the euro, though.

USDA's June estimates of planted crop acreage and 1 June quarterly grain and soybean stocks had been long awaited by the grain trade. Corn stocks and planted acreage were well above what had been expected and considered to be quite bearish. Soybean acreage was slightly lower than expected, but soybean stocks were higher than private pre-report estimates. Total planted acreage of all classes of wheat was somewhat larger than thought, but all wheat stocks were almost exactly as projected. On balance, all of this cast a bearish shadow over markets entering July, but not surprisingly, they quickly turned their focus back to weather. It was another example of how quickly highly anticipated reports from USDA become yesterday's news.

Shifting Demand

To the catalog of disappointing crops, currently including Brazil and Argentina, the Western European wheat crop must be added. Winter wheat production prospects in France and Germany appeared to be excellent ever since those crops were seeded last fall. That optimism continued as wheat broke from dormancy in late winter and developed very nicely throughout spring. A few weeks before the crop was ready for harvest, however, the rains came and stayed. There was incessant rainfall over much of Western Europe and on mature wheat for several weeks. Flooding was widespread. By the time fields dried out enough to support harvesting equipment, it became clear that a substantial amount of wheat was lost. Yields were far below what had been expected before the rains. Equally important, the wheat harvested had deteriorated enough that much of it did not meet the minimum standards for milling quality. Low test weights, high moisture content plus high percentages of damaged and sprouted kernels were common. Some estimates put the amount of lost EU wheat as high as 12 MMT, which would mean a total production of only about 146 MMT, down from 160 MMT in 2015/16. Additionally, an as yet unknown but certainly substantial portion of the wheat crop is very low quality – fit only for animal feed - if that.

Russia, Ukraine and other Black Sea regional wheat producers have had good winter wheat crops. The Russian crop is especially so, larger than expected and of generally good quality. Prospects of big EU and Black Sea crops had driven world wheat prices down to near \$160/MT. However, the lost production and low quality of French and some German wheat quickly changed world wheat market dynamics, and those prices began to recover much sooner than expected. Moreover, it seems clear that the world's supply of high quality milling wheat will be limited and that the U.S. and Canada will be its main suppliers. In short, whereas prospects for U.S. wheat exports had appeared to be almost as dim this year as in 2015/16 when they fell to the lowest level in decades, the outlook has improved considerably.

In the world corn market during most of 2015/16, U.S. exports were limited by stiff competition from Brazil, Ukraine and an abundant supply of feed wheat. However, Brazil's corn production shortfall rather quickly took that country out of the export market. Argentina has limited corn supplies available for export. Ukraine's corn crop is currently under stress from drought, and production there seems likely to fall below previous expectations. Rather abruptly, the U.S. has become the low-priced corn supplier to world users. With another potentially very large crop looming for 2016/17, the U.S. will very likely be the dominant supplier to the world market at least through the end of 2016 and perhaps beyond.

In somewhat similar fashion, reduced South American soybean supplies caused prices in Brazil and Argentina to climb to the point that the U.S. is basically the only supplier of soybean exports to crushers in China, Europe and elsewhere. U.S. soybeans have virtually no competition until the next Brazilian crop becomes available in February 2017. The result has been a surge of export sales for the remaining old crop year that ends 31 August and also for the new 2016/17 crop year. In fact, the volume of U.S. soybean export sales for the following crop year was record large as of late July. Weekly soybean export shipments are heavy and will probably stay that way indefinitely. U.S. old crop ending soybean stocks are being drawn down close to

300 million bushels, and estimates of ending 2016/17 ending stocks will probably be even less. There is little chance that U.S. soybean supplies will become nearly as tight as they were just a few years ago, but the U.S. needs to harvest a big crop this fall, and the soybean market needs to encourage South American farmers to expand the amount of land they use for soybeans when they start planting in just a few months.

The enlarged expectations for U.S. grain and soy exports are likely to strain loading capacity at Gulf of Mexico facilities and even in the Pacific Northwest in ways that have not been experienced in years. The value of that loading capacity as expressed through FOB price levels should be considerably enhanced during much of 2016/17.

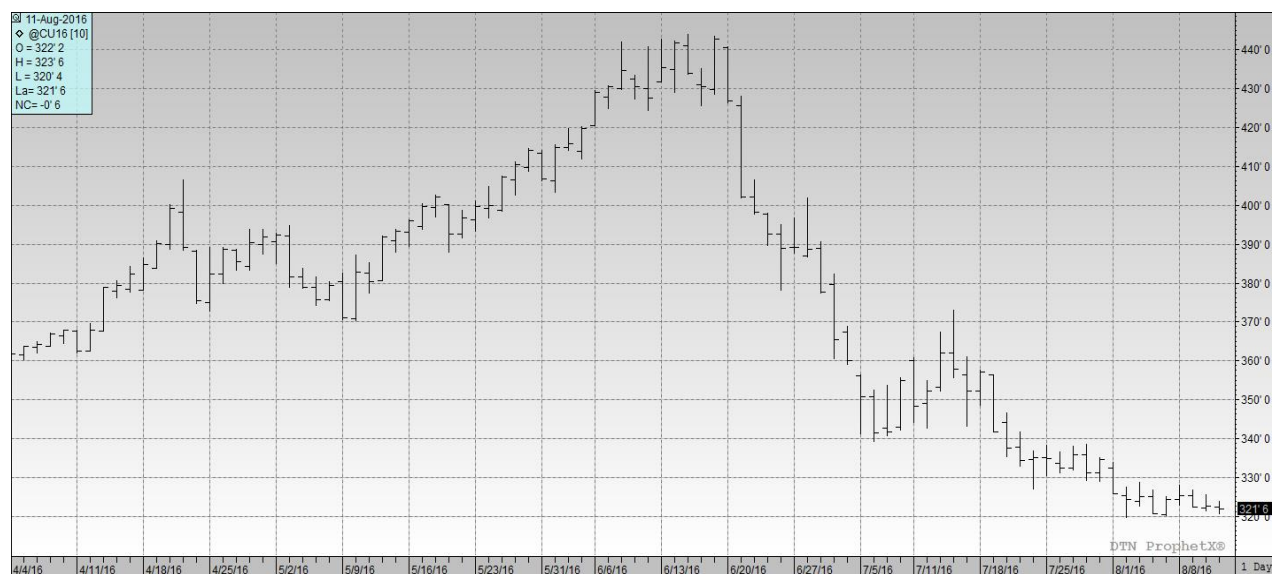
The 2016/17 U.S. crop cycle is shaping up to be a far different one than what was portrayed by doom-and-gloom forecasts made early in 2016. It seems to be turning into a uniquely desirable one of big crops and big demand, the best of all worlds. The potential for big crops is currently pressuring grain and soy futures levels to multi-year lows, but such bearishness should be tempered by the impact of growing export demand before long.

September Chicago Wheat Futures Prices



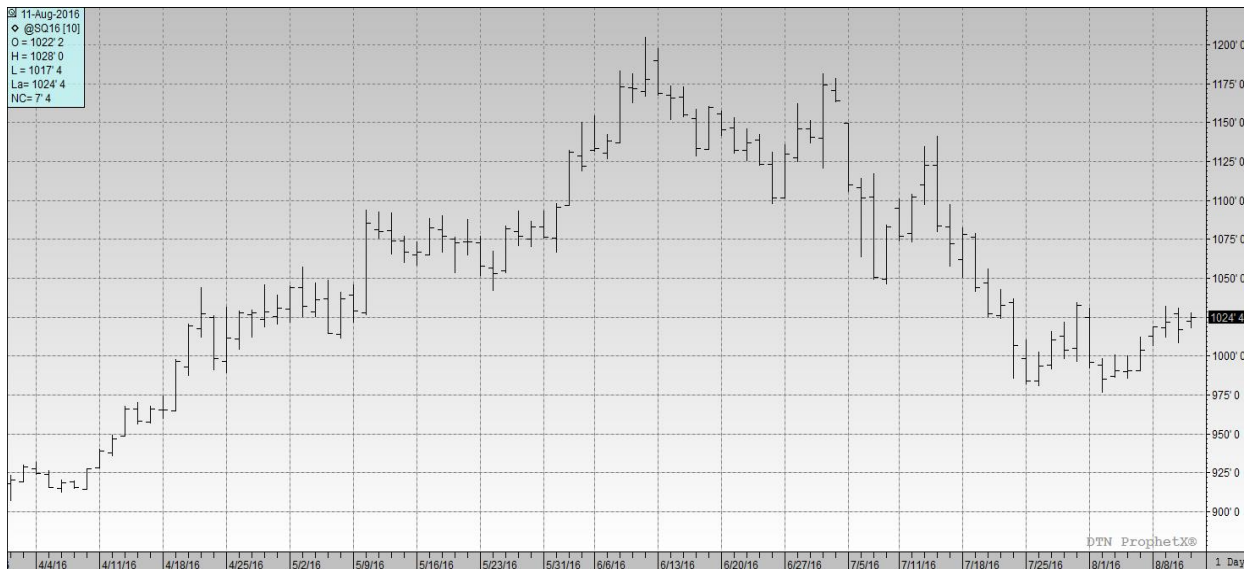
Source: Prophet X (8/11/2016)

September Corn Futures Prices



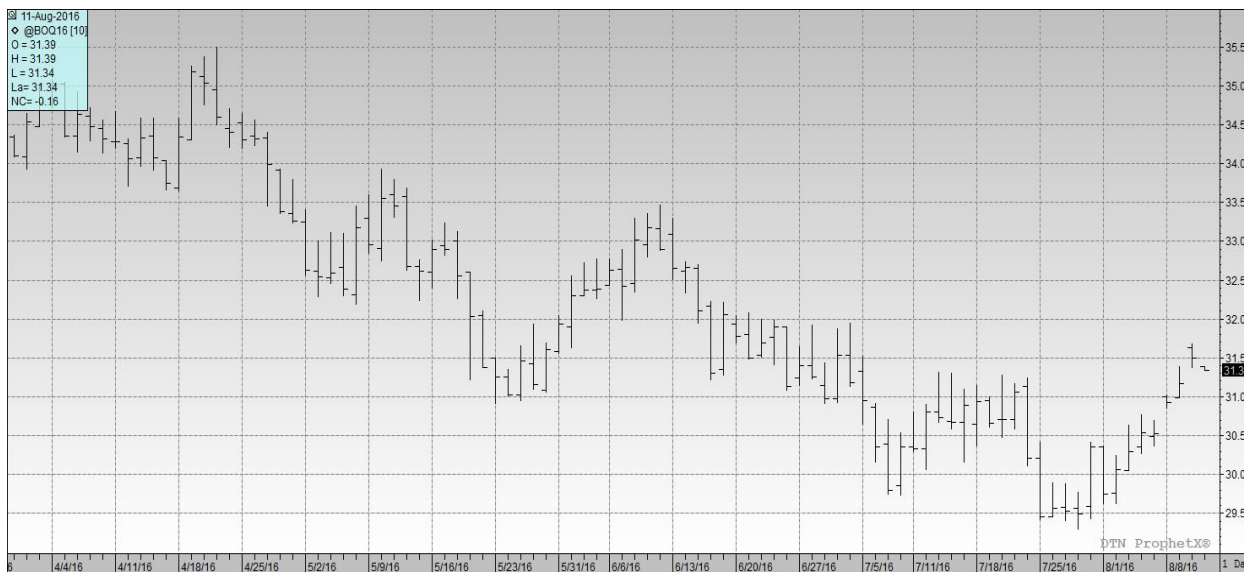
Source: Prophet X (8/11/2016)

August Soybean Futures Prices



Source: Prophet X (8/11/2016)

August Soyoil Futures Prices



Source: Prophet X (8/11/2016)

September Crude Oil Futures Prices



Source: Prophet X (8/11/2016)