



MACRO Voices
with hedge fund manager Erik Townsend

Leigh Goehring: The Global Food & Fertilizer Crisis Is Much Bigger Than Russia/Ukraine

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Erik: Joining me now is Leigh Goehring, Co-Founder and Co-Chief Investment Officer for [Goehring and Rozenchwajg](#). Leigh has some terrific downloads for you. First of all, there are two separate research reports, which we'll be referring to and which a lot of this interview is based on. Also a slide deck, which pulls the most interesting slides out of those research reports that we're going to be referring to during this interview. You'll find the download links for all three of those things in your research roundup email. If you don't have a research roundup email, just go to our homepage, [macrovoices.com](#). Click the red button that says looking for the downloads. And I recommend that you download the chart deck specifically because we'll be referring to the graphs and charts it contains during this interview. Leigh, it's great to get you on the show. We had your partner Adam Rozenchwajg on the show a few weeks ago talking about the energy crisis. I'm really excited to get the perspective on the global agriculture and fertilizer crisis. So many people are talking about, but frankly, most of them think that this is a Ukraine-Russia specific event. You've been analyzing and researching this for years. And I know your perspective is this is a much bigger picture that investors need to understand. It was exacerbated by Russia-Ukraine, but there's an underlying picture that's really important. Please tell us that big picture.

Leigh: Okay! Very good Erik. Thank you very much for having me on. And I listened to your podcast with by partner Adam, and where you covered a lot of the very interesting aspects in the energy market and I thought that was excellent. Step back here for a minute. You know, one of the things that everyone believes in about the global agricultural crisis that we find ourselves into today is that it all began with Russia's invasion of Ukraine. And I would like to say that the underlying fundamentals for this global agricultural crisis have been being put into place over the last several years. And it was only a matter of time before something occurred, some sort of potentially Black Swan event or some sort of underlying fundamental change in global agricultural supply that actually caused this crisis to occur. But whether it was the Ukrainian crisis brought about by the Russian invasion or not. Something was about to trigger it off and we're in a full blown global agricultural crisis today.

Erik: Okay Leigh, let's dive into this. This is a story about demand globally for grains. Now, going back to the 1980s, up to 2000 or so what did the grain demand look like and why did it change around 2000 and what is it now?

Leigh: Yes Erik, and this is critically important to what's brought about the crisis in global agricultural markets today. If you go back, say the period from 1980 or the late 70s, all the way up to 2000. Global grain demand grew very consistently, at about 1.3 to 1.5% per year, which was pretty much in line with per capita or pretty much in line with global population growth. However, starting in the late 1990s, a big fundamental shift began to happen in global grain demand. That trajectory, that line, basically pivoted it up from about 1.3 to 1.5%, all the way up to as high as 2.5% in the period from 2000 to 2020. And it was that big increase in global grain demand that we believe is one of the driving forces that has caused the global agricultural markets to eventually slip into crisis.

Erik: So you've got an underlying phenomenon, which is population growth over the world generally means that there's going to be exponential increase in demand for grains. But you just said it was according to population growth, only up to about 2000. And then there was an inflection point where something changed, what changed and let's refer to page one of the chart deck because you've got an excellent graph that really explains this. What happened around 2000, that changed the demand for grain was where suddenly grain demand got much more exponential after that late 90s, early 2000s period.

Leigh: Yeah, what what's interesting is that if you study, you know, dietary preferences and how dietary preferences change in emerging markets, almost all emerging markets in the post-WWII environment have gone through a very similar set of dietary preference changes. That is that when you're poor, basically you live in an economy that produces about \$500 per capita GDP. Your diet is primarily starch base. It's rice and bread, which is obviously grown from wheat or baked from wheat. And however, As your economy eventually grows and your country becomes richer, what begins to happen is that you begin to change your dietary preference. When all of a sudden, instead of \$500 per capita GDP, you're up at \$2,000 per capita GDP and then a \$5,000 per capita GDP, you begin to actually want to consume a lot more animal protein. And one of the interesting things about growing animal protein is that it's much more grain intensive than just eating standard rice and wheat in the form of bread. So what happens is, as you consume more animal protein, the demands to produce more grain on a global basis increased substantially. And what's interesting is this chart is this just goes to show what the long term relationship is between per capita GDPs and grain consumption. There is a bold line in this chart. This is a index that we constructed of the five, there are only five of them actually, there are six, but one of them we don't have protein consumption data for these are the only five countries from 1960 to today that have gone from basically having \$500 per capita GDP that have grown to over \$20,000 per capita GDP.

In other words, they've gone from being poor to becoming rich. And what this index is nothing more that tracks the and puts together a composite index of what the protein consumption did at various points of per capita GDP for each of these countries. And then what we do is we superimposed a lot of these Asian emerging market economies on where they stand in that protein consumption preference trajectory. So there's a lot of interesting stuffs here to ponder. You can see, obviously, one of the reasons why this started in the late 1990s and 2000, the grain consumption began to pivot up hugely was because of the entrance of China into this

period of rapidly increasing animal protein consumption. You know, they've gone from basically \$500 per capita GDP in the mid 1990s to basically \$10,000 per capita GDP today. And what's happened is their, their animal protein consumption has basically increased fourfold. But what's so interesting about this chart is you can see there's a huge number of countries that have very large populations that are only now beginning to enter this period of rapid protein, animal consumption. Countries like India, Indonesia, Pakistan, Bangladesh, each one of these countries now is only beginning to enter this period of rapidly changing their dietary preferences. And the populations in these countries are almost close to 2 billion people. So the thing is, is that the strong grain demand that we've seen starting back in the late 1990s-2000 based upon our modeling should continue as we go through the next 10 years.

Erik: Okay, so the underlying story here is a really good message, which is the poverty that used to exist all across the world has gotten a little better. Emerging markets got a little bit richer than they used to be but the consequence of that is when they get richer, they want to eat meat, too. And when they do, the cow that makes the meat ate a whole lot more grain than the peasants who was poor eating rice and bread would have consumed. And that means there's a much higher rates, we've got several factors compounding on top of one another, you've got global population growth just means demand for grains when you're eating rice and wheat yourself has to go up, then you start to eat meat because the economy gets better. And that dramatically increases that rate. So no longer is it just a function of population growth, but it's an exponential function of population growth. And then on top of that, we've got the fact that maybe China has gotten to the point where it's sort of leveled off. But all of these other emerging nations are really just at the beginning of this story. That means that there's going to be a whole lot more increasing exponentially increasing demand for grains in coming years. Sounds like, gosh, that's got to be the end of this story. But hang on, I read your report, Leigh. This is just chapter one. There's also chapter two, which is about biofuels. What's the story there?

Leigh: Yeah, what are the interesting things is that this is very unfortunate, but you know, Western governments have encouraged us over the last 30 years, is that we've, unfortunately have hooked global agricultural markets into global energy markets. And obviously, when we think about higher energy prices, we think about the cost to make fertilizer or the cost to run a diesel tractor for our farmer. But one of the big huge costs for energy is the idea is as energy prices rise, that increases the demand for biofuels. And these are fuels, we're very familiar with them. Ethanol, which now in the United States, every gallon of gasoline that you buy today, 10% of that is ethanol. And they're talking about taking it to 15% that we have basically, true the biofuels mechanism, we've basically hooked global energy markets into global grain markets. And this is the fact that we're in a global energy crisis, which you very, very well outlined with Adam in your previous podcast with him. You know, the propensity to increase bio fuel consumption is only going to continue. And I should point out how big this has already become. For example, if you look at total global increases in oil production, from 2010 to 2020, we basically increase global oil production by about 13 million barrels a day. You know, about 8 to 9 million barrels of that came from the US shales, which I know you and Adam talked about extensively in your podcast. But what's so interesting, the second largest item between 2010 and 2020, as far as oil growth is in the biofuels category. We basically added 2 million barrels

per day of biofuels during that time period, which made it the second largest increase in oil source in the world. So, if you read the papers done by the International Energy Agency, they project that we're going to have another 30% increase in bio fuel consumption in the next four to five years. So the thing is that the higher the energy crisis is now spilled over directly into the global agricultural markets. It is exacerbating the crisis that exists in that market today.

Erik: So global grain demand is growing on an exponential rate, that exponential rate increased substantially because in emerging markets got richer. That also means that we have less acreage available for, you know, as the global population grows, there's more cities and so forth, we don't have as much farmland acreage available to grow these grains in. And then on top of that, we've got policy that's leading to a rapidly and exponentially increasing demand for biofuels, which also depends on some of the same grains. You'd have to think Leigh that surely that's enough to paint the picture for a perfect storm. But reading your research, there's another ingredient to all of this, which is we've had a really lucky spell of good weather for like 20 years now. What's the story there and why would there be reason to think that the weather might not be as good for the next 20 years as it's been for the last 20 years in terms of how good the weather is for growing crops?

Leigh: Yeah, I mean, you bring up a really good point there Erik. One of the reasons why we were able to meet this huge ratcheting up of global grain demand from going like 1.5% per year to 2.5% per year is that over the last 30 years, and certainly over the last 20 years, we on a global basis, we've had a an unprecedented string of great global growing seasons, specifically and not only the northern hemisphere but in the southern hemisphere as well. Now, that's highly unusual, except for the drought years in North America and the US in 2012. We haven't had a very disruptive event in global crop growing condition markets for a very, very long time. And that's what's enabled us to actually meet this big huge ratcheting up of global grain demand, you know, and we can talk about that later. We can talk about the fertilizer input and why that's so important as well, that a big input increase for the ability to ratchet up global grain supply during that time period. But one of the interesting things is we believe that we were on the verge of having weather patterns change significantly. And it's a little complicated and a little esoteric but I think it's very, very important. Obviously, we've been in a global warming period, pretty much over the last 50 years. And contrary to what you read in the press where global warming will definitely hinder the production of global crops. Our research tells us something completely different, that what are the best? What are the best things that happened to global agriculture in the last 30 years is the world has gotten warmer, and that warming influences crop growing conditions in ways that many people don't think about.

One of the most important things and this is actually I believe on chart 2 that's in your deck has been the increase in the northern hemisphere of the global growing season. Basically, in the US, for example, between the mid-1970s to today, we have increased the global growing season by about 12 days on average versus back then. And when you think about it, one of the biggest, biggest negative things that can happen to can damage crops in the growing cycle is having late season frost in the spring and early season frost in the fall. So if you can push back those frost periods late in the spring and early in the fall, you by definition, increase the quality

of your growing season. And this has not only happened in the US, in Canada, in North America. This has happened across Europe and Russia as well. You know, the growing season in Russia, and significant parts of Russia has increased, we believe, by almost a similar amount. And the numbers are really, really impressive. If you go back to 2000, Russia produced 19 million tonnes of coarse grains that would be obviously primarily corn and wheat. And Ukraine produced 10 million tonnes. So about basically 30 million tonnes of grain. 2020, Russia produced 40 million tons of grain, coarse grain, and Ukraine produced 40 million tons of coarse grain for a total of 80 million tons of grain production. You know, those are incredible numbers. And one of the reasons why that took place is because Russia and the Ukraine, the former FSU was able to increase significantly the length of his growing season. Now, we believe that this is all about to change. And we believe that change has already begun to happen although it's being blamed for the wrong reasons is that, I'm a big believer that that one of the reasons why we've had very, very good growing conditions over the last 30 to 40 years, is because we've been in an unprecedented period of strong sunspot activity.

The activity in the sun over the last 40-50 years has been in a very strong period, which is almost unprecedented in the history of people that study solar, the solar activity. However, one of the interesting things starting back in the previous two sunspots cycles was last about 11 years is that we've seen significant decreases in sunspot activity. And we're in a third cycle, the 25th sunspot cycle, which again, it looks like it's going to be a another down cycle for sunspot activity. Historically, if you go back lowering sunspot activity for a lot of very interesting reasons, winds up producing cooling periods. And cooling periods if you study global agriculture, every global cooling period that we've been through, has produced very very disruptive weather events for agriculture. And it may be you know, everyone is blaming all the unusual weather events that we've had in global agricultural weather markets over the last several years on global warming. But maybe it's this transitional period that we're going from global warming to global cooling that's producing all this unbelievably difficult weather. So what I would think is that we've been blessed with 25 to 30 years of tremendously good, global growing crop conditions. And I think we're entering in a period where global growing conditions are going to be challenged, year after year by increasingly difficult a variety of events, whether it be floods, droughts, excessive heat, much earlier frost in the in the fall, and later frost in the spring, things like that. So I think it's gonna be very, very difficult to meet this big ratcheting up of global grain demand that we've seen over the last 20 years.

Erik: So we've got all of these factors coming together to really bring into question whether or not the world can grow enough grains to meet this exponentially growing demand for grains as we have less and less farmland available because of urbanization. But hang on a second, there's another dimension to this whole story, which is, we've reached a point now, where fertilizer is not just to convenience farming. In other words, as much as some people might prefer organic fruits and vegetables, you know if you can afford them great, but we can't grow enough food for the entire planet now that we have 8 billion people on the planet as opposed to about 2 billion is what a lot of scientists think the natural support level was if you don't have modernized farming. You can't grow enough food for all those people without fertilizers. So fertilizers play a really important role. Tell us a little bit more about the role of fertilizer in this

story from 2000 to 2020, the last 20 years where there's been this increase in demand. How has it played out and what are the challenges we're facing now?

Leigh: Yeah Erik, I can't overestimate the importance of fertilizer in the ability to increase its global grain production. Just some interesting just to point that out, like, for example, between 2000 and 2020, global grain supply grew a little over 40% during that time period. And what's so interesting is that you can debate what were the biggest inputs to cause that 40% surge in grain supply, whether it be crop genetics, good weather, or whatever. But one of the observations that you can avoid is that grain production went up 40%. And that total application of fertilizers that is nitrogen, phosphate, and potash. Application of those three major fertilizers went up 40%. And even on a shorter term basis between 2010 and 2020, global grain production went up basically about 10%. And fertilizer applications went up about 10%. So the thing is that, obviously, fertilizers have had a huge input into the ability of the global farmer to increase his crop yields. Now, what's so interesting about fertilizers is that just like we're talking about, obviously, the way the energy crisis has impacted the agricultural markets through the biofuels transmission mechanism.

One of the other ways that it influences global agricultural markets, is that the making of fertilizer is incredibly energy intensive. And the thing is, is that we've already seen, for example, in the nitrogen complex, which is, of course, one of the great three, one of the three great fertilizer groups is that the we've seen because of high natural gas prices, and the shortage of natural gas, which is a function of the global energy crisis that we've got going full bore in the world today is that global nitrogen production is down, we estimate down about 5% on a year over year basis. And given the energy crisis that's still gripping Europe and the fact that natural gas prices in Europe are you at \$60 in MCF today, we believe that, you know that this constriction of nitrogen supply will continue. And our analysis is that 5% reduction in nitrogen fertilizer on a year over year basis will ultimately impact and decrease crop yields by somewhere between 1.5 to 2% over time. So what's interesting is that, the fact that we've got a potential fertilizer shortage developing on a global basis is another reason why we're going to have trouble growing food supply going forward from here.

Erik: Leigh, you mentioned the natural gas connection. I just want to remind any listeners who didn't hear the previous interview with Adam Rozencwajg. Adams contention is the really big story as much as everybody's talking about oil is natural gas. Americans don't think about it but if you're in Europe, you know how big of a deal this is. Adam predicts it's going to be a really big deal for North America because he expects North American and European Natural Gas prices to converge. That means the cost of farming in the United States because natural gas is an input cost of making so many different fertilizers is going to increase dramatically. So the food inflation function coming from natural gas is tremendous. But there's another aspect to this Leigh, which is potassium, one of the other key fertilizers comes from potash. Now, what everybody's talking about right now is that some of the biggest exporters of potash are Russia and Belarus. And of course, Russia and Belarus. They are on the other side of this conflict from the west. That means they could withhold supply. Here's the interesting thing. Canada has almost as much proven reserves of potash as Russia and Belarus combined. Canada is by far

the biggest country in terms of potash reserves. Now to a normal thinking person who's not familiar with Canadian politics, you might assume that means that Canadian farmers are just swimming in fertilizer, they got more than anybody else. But the Canadian government is actually intentionally withholding it and trying to impose new restrictions on farmers preventing them from using as much fertilizer as they want to because they're trying to as part of the whole climate movement. They're trying to reduce carbon emissions. I think there's some other stories around the world that you've written about, tell us some other things that are going Leigh that fit into the story.

Leigh: Yeah and again this highlights the importance of fertilizer application and how it positively impacts crop yields. One of the greatest experiments has taken place in trying to restrict traditional commercial fertilizer application was taken place in Sri Lanka in the last couple years. The government of Sri Lanka and it's not clear why they did this. Some said they wanted to, they want to say they didn't have enough foreign currency to buy foreign produce fertilizer. But what they did is they or whether they were convinced by a think tank to actually go back to organic farming without the use of modern fertilizers, whatever reason why they chose to do it, they did it. And the impact on crop yields was almost immediate and catastrophic. For example, obviously, one of the major exports from Sri Lanka is tea. And one year after they switched over from using traditional commercial fertilizers to using quote unquote, organic fertilizers, that which is primarily animal dung and things like that. The tea yields or the yield from tea plants fell close to 25 to 30%. And since this was a huge source of foreign exchange income for the country, it set off a huge financial crisis in the country. So the thing is that you cannot underestimate the importance of fertilizer application, and how it affects crop yields going forward. As you mentioned, the potash market is interesting. 40% of the world's potash supply comes from Russia and Belarus. And most of those Russian supplies are party supplies are getting out, however, the Belarus supplies, which go by rail go through Lithuania have been embargoed. So that's caused this huge tightness in global potash markets.

Erik: Now, let's quantify how this transmits to food prices because, you know, if you told me the cost of some minor ingredient, let's take uranium as an example. The price of uranium doubles, well, you know what the cost of uranium to a nuclear power plant is a tiny, tiny little line item if the cost of the fuel doubles, it really doesn't affect the price of electricity very much. On the other hand, if you have a key ingredient in some product well that's going to dramatically increase the end price of that product if that ingredient goes up in price. So let's assume for sake of argument that the cost of fertilizer were to double, is that a 5% increase in the cost of food or is that a 10% or is that 100%? How does it translate?

Leigh: Oh, that's a very interesting question and I'd have to think about that Erik. Obviously, what are the problems, fertilizer prices have run so strongly over the last years, I mean basically, the entire nitrogen phosphate potash complex went from a year and a half ago, two years ago \$275 a ton to, you know, they are potash prices that actually broke \$1,000 a tonne selling into Brazil. Urea prices got as high as \$900 and phosphate prices got as high as in the mid-800s. Now, if you're a farmer in an emerging market and you basically operate on a cash basis with no ability to draw on credit from banks, things like that, when you have a huge short

term surge in fertilizer prices like that, you can't afford to buy it, you just don't have the cash to buy it. So one of the things that we're seeing on in many places of the world, a lot across Africa and some places in Asia that farmers don't even have the ability to buy fertilizer to apply because they just don't have the cash to buy an input that is now up three times in price from what it was a year and a half or two years ago. So how that translates into higher crop prices? It's going to be because obviously, it's gonna be another input reduction that winds up restricting supply in the face of very, very strong demand. What's the actual price intensity of those cutbacks? I'm not so sure, but it's going to be significant.

Erik: There's another point, I think it's really important that we make here Leigh which is a lot of people in the green movement might say, oh well, what we ought to do is get rid of these genetically modified seeds and get rid of fertilizers completely and go back to nature, do it the way nature intended it without any fertilizers, without any genetically modified anything. You know, I think that's a terrific goal but everything has a cost. And the cost of doing that would be we'd have to call half of the global population because we've reached a point where it's not possible to grow enough food for everybody on the planet without using the technology of fertilizers and so forth. You've predicted that this could eventually lead to something you're calling food nationalism. What do you mean by that?

Leigh: Yeah, in fact, this has already begun to happen. And I think we'll see increasing episodes of food nationalism as we go through this decade. And the last time we saw this phenomenon was all the way back in the 1970s which of course, was an inflationary period with their various points in the 1970s that had surging grain prices and it's surging beef prices. But what food nationalism is, is that in order to bring down domestic prices, and or increase domestic supply, decrease domestic prices, what you do is you basically ban the exports of various food groups. Now, this cycle started with Indonesia, which is the world's largest palm oil exporter. And now, that's interesting for a variety of reasons. Remember, one of the great inputs to biodiesel. And when we talk, we don't have enough time to talk about biodiesel today. But obviously, biodiesel is made from basically vegetable oils. And obviously, biodiesel demand has been growing strongly because of ESG concerns, which is put an extra demand on global palm oil supplies. Now, it's interesting, what happened there was that, obviously, a huge source of vegetable oil in the world comes from sunflower seeds. And it turns out that what is the world's largest sunflower seed producer in the world is the Ukraine. So when the Ukraine sunflower seed crop this year, didn't happen, because of the war, that created a huge shortage of global oils, cooking oils, vegetable oils. One thing that Indonesia did, because of skyrocketing vegetable oil prices, palm oil prices, is that they banned the export of palm oil. So that's a classic example of what I would call food nationalism. And we've also seen India undertake it like India had a big drought earlier this spring. Damaged their wheat crop. And so what did they do, they put an export ban on all wheat exports. Now India's become a major league wheat exporter the last several years. And they basically export close to what was estimated almost 7 million tonnes of wheat, which is a significant amount. And that's all been banned. And that's all been done because of food nationalism, in an attempt by the Indian government to increase wheat supply within the country and bring down the price. And once one country starts doing this, a lot of countries will begin to join on the food nationalism bandwagon, which happened

back in the 1970s. And I think we're going to see this phenomenon happen over and over again as we progress through this decade.

Erik: Well, that really scares me Leigh because it seems to me and please tell me if I'm getting this wrong, it seems to me that this food nationalism you're describing. If I go back to what you've already said about the concentration of certain resources, most of the wheat in the world gets produced by a handful of countries. Fortunately, the United States is one of the biggest producers of grains. But there's a lot of countries around the world where they have to import all of their grains, because they don't have the right kind of soil for growing it themselves. They've got to import all of that stuff from the exporting nations. So if the exporting nations stop exporting, entire countries could be unable to get essential types of food. And we're not talking about putting an embargo that says okay, well, we're not going to export BMWs anymore. You can't have your sports cars and your luxury items from Germany because the German government's had a some kind of conflict with your government, we're talking about the food you need to eat to survive is not going to be available because of changing policies of other countries. That's the stuff that resource wars come from. And frankly, we've already got a rapidly developing and I think mushrooming geopolitical situation globally, where there's increased tension between the nuclear superpowers. You're telling me if I'm reading this correctly, that we could have Global Food Wars on top of energy wars coming before this decade is out? Please tell me I got that wrong.

Leigh: Well, it's something to worry about. And again, we'll go back to how did we get into this problem in the first place? And it's basically, one of the reasons why is the global grain demand has been very, very strong and has become much stronger in the last 20 years. And just, again, to harp on this. One of the big reasons is the number of people that are in that notch where they're changing their dietary preferences from going from starch to animal protein. 30 years ago, they were somewhere between 500 to 700 million people that were in that period of their economic development. Today with China in the midst of that period. They're not done with it yet now being joined by countries like Vietnam, Philippines, Thailand, Indonesia, India, Pakistan, Bangladesh, that you've got almost 4 billion people in that notch where they are beginning to change their dietary preferences. We've never been in that position before. Now you overlay that with the fact that you may have changing weather patterns that you can't meet that strong demand. And then you throw on top of that, things like food nationalism, and the fact that you've basically hooked the global oil and natural gas markets into the grain markets through biofuels. And you have a period where I think you're going to have a very, very, you know, a rolling crisis and potential rolling crisis in global agriculture, between now and the end of this decade. Now, whether this winds up with huge social unrest, it's a distinct possibility. And it depends on how bad things would get, it's hard to say, because we don't know whether we will have a super disruptive weather events, things like that. But the situation is set up for potentially that to happen.

Erik: Well, this is kind of a somber point to change the subject Leigh but this is an investing podcast. Where are the trades here? It seems to me like it's unlikely that energy and agriculture

prices are going down from here. Do we invest in the actual commodities? Do we invest in the companies that produce them? Where are the best investments where the place for investors?

Leigh: Well, I think the best, we talked a lot about fertilizers in the show today. And I think that the fertilizer stocks, they've had big runs over the last year and a half or so. But they still represent tremendous investment. You take stocks, like Mosaic and I've followed Mosaic for almost 35 years, and I know its history very, very well. Basically, Mosaic 20 years ago was a very sick company. And one of the reasons why it was a sick company because their flagship potash mine, that is the Esterhazy complex up in Saskatchewan had severe water flooding problems to the point where there was even talk back then they may have to very well close the Esterhazy mine and take a massive write off on their investment there. Now since then, what they've done is they've developed a whole new mining shaft complex, that's basically significantly up dip from the water flooding problems. So the water flooding problems will never be a problem again. And by doing so that they will significantly lower their cash production costs to produce potash. First, they would have to pump any water. And second, they have now they've rebuilt those shafts very close to the working faces of the mine. So instead of having to spend 45 minutes to get to the mine face and then 45 minutes to get back to the shaft, you could basically walk out of the shaft to begin mining directly.

Leigh

So we're talking about being able to lower their cash costs significantly going forward from here on out. What's so interesting is that in the last previous bull market peak and fertilizer prices, which basically took place in the first quarter of 2008 where the entire fertilizer complex peaked out at well over \$1,000 a tonne both nitrogen phosphate and potash all got as high as \$1,200 a tonne. Mosaic traded basically 17 times peak earnings. Today, I would say that you're not anywhere near a peak in fertilizer prices. This fertilizer bull market has years left to run. And is anyone want to guess what Mosaic trades on today in earnings. It basically trades at three times fully tax reported earnings. The stock is radically undervalued. And it's the same way with Nutrient is the old you know, the amalgamation of the old potash corpus Saskatchewan and Agrium. It is considered the quality name in the global agricultural space you've got you have significant fertilizer exposure to the agricultural farmer market to their retail agricultural outlet stores. You have the world's largest producer of potash. A big phosphate producer, big nitrogen producer as well. And that stock trades at five times this year's earnings. So the thing is, is that these stocks are ridiculously cheap. There's no way that they incorporate today's fertilizer prices, let alone what I think fertilizers down the road will be significantly higher than where they are today. So the thing is, I think you've been given a tremendous buying opportunity in these fertilizer names.

Erik: Leigh, I can't thank you enough for a terrific interview. But before I let you go I want to ask you about what you do at Goehring and Rozencwajg and particularly listeners listen up because the samples that you get from us in MacroVoices interviews are oftentimes from researchers who sell very expensive newsletters. You want to subscribe to the thing, you get the sample on MacroVoices. You get hooked and then it's lots and lots of dollars in order to subscribe. Leigh the subscription to your letter costs zero. What's the story there?

Leigh: Well the story is that, many people think that and I know Adam mentioned this in his podcast with you - many people think that we are a research shop, you know, some of the research that we do on global commodity markets, I think is the best out there. And a lot of people will agree with us and except we're not a research shop. We are a money manager shop. We manage money as a profession. And what we've done is we've this what you see in our quarterly newsletters is all the research that we do that we incorporate into our investment process and how we construct our portfolios. So you as an outsider are getting a free look into what Goehring and Rozenwajg is thinking, and how we're positioning our portfolios, what we like and what we don't like. And so it's a very nice opportunity for people to figure out what we're doing. But we're not a research shop. We do excellent research. I think we do some of the best research that's out there. But we are money managers, so if anyone's interested in having their money managed exclusively in global natural resources and commodities. We're the place to go! We have a tremendous, long 30-year track record, which I would take up against any other person in the natural resource space.

Erik: And the website is www.gorozen.com. Patrick Ceresna and I will be back as [MacroVoices](#) continues right after this.