



SOY TRANSPORTATION COALITION

Keep on Truckin'?

Soy Transportation Coalition Reviews Semi Weight Limits



Mike Steenhoek
STC executive director

Rising fuel costs, labor shortages and increasing congestion on the nation's roadways have prompted some lawmakers to consider increasing weight limits for

semis. But the jury is out on whether such a move is good for those sharing the highways with the industries relying on those trucks for transportation. The Soy Transportation Coalition (STC) and the United Soybean Board (USB) recently commissioned Informa Economics, Inc., to study the issue.

"Because this is a hotly contested, controversial issue, it was prudent for soybean farmers to take inventory of available research and analysis on the subject and determine the potential cost savings and efficiency gains that might be realized by the soybean industry," says Mike Steenhoek, STC executive director. "Our highways and interstates are increasingly incapable of accommodating transportation demands; resulting

in further drag on our economy. Increasing semi weight limits offers the potential of relieving some pressure on the congested system."

Federal and state regulations traditionally govern the weight and physical dimensions of trucks on U.S. highways. Current weight limits on semis of 80,000 pounds gross vehicle weight (GVW) have been in place since 1975. Proponents would like to see levels approaching 100,000 pounds. In the STC/USB-funded study, "Heavier Semis: A Good Idea?" economists note that trucking accounts for about 80 percent of expenditures on U.S. freight transportation, and that those costs are influenced by the amount of cargo that can be transported per shipment. Specifically, the STC report recognizes the impact of raising the current 80,000-lb., five-axle semi configuration to a 97,000-lb., six-axle configuration on motorist safety, infrastructure integrity and the economics of the soybean industry.

"The soybean industry is heavily dependent upon our highways and interstates to transport products that find their way onto the dinner plate. But the system is congested and underfunded,"

says Ed Ulch, soybean farmer from Solon, Iowa, and STC board member. "In commissioning this study, the STC sought to explore options for increasing capacity over our roads in a way that is not detrimental to motorist safety or infrastructure wear and tear."

Solid Motorist Safety Statistics

Fewer trips and reduced truck mileage with higher weights should theoretically translate into fewer accidents with semis. Fatalities and injuries in accidents involving trucks have been declining for several decades, even in the wake of greater traffic congestion and higher speeds.

According to the Federal Motor Carrier Safety Division, for every 100 million vehicle miles traveled by semis, traffic accidents resulted in 2.15 fatalities and 38.1 injuries during 2007 – down more than 50 percent from 1987. Informa projects that applying the same accident rates to the estimated 2.7 billion mile reduction in truck trips allowed by higher weight limits could lead to a net reduction of 67 fatalities and 1,028 injuries per year by 2020.



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“No compelling evidence suggests that the higher truck weights would themselves lead to an increase in fatality or injury rates, so long as the additional axle is included to provide added braking power,” the report reads. “...Adding an extra axle with the accompanying brakes would increase excess brake capacity and improve stopping performance. Adding an axle also increases the number of tires on a truck from 18 to 22, reducing the load weight per tire and improving tire surface and braking friction. Research results also indicate that there is very little difference in terms of...static roll stability, load transfer ratio and rearward amplification.”

Infrastructure Impact

Research indicates that a 6 axle, 97,000 lb configuration would cause the same or less damage to the road system than a 5 axle, 80,000 lb semi. The additional axle displaces the increased weight to negate any potential damage to the road itself.

While increasing allowable weights could mean less wear and tear on roadways, Informa finds the existing data is complicated and magnitude of problems hard to predict.

“Structural integrity of bridges depends not only on the weight of vehicles that pass over them, but also the number of axles that carry the weight and the distance between axles – a relationship used to establish the ‘bridge formula’ that guides weight restrictions,” the report reads.

As a general rule, Informa finds most bridges constructed after the late 1970s can support heavier trucks than are allowed under current rules. However, only 37 percent of today’s bridges have been built since 1979. Hence, the principal cost for bridges associated with heavier trucks lies in ensuring bridges can safely accommodate trucks. Any bridge replacement or repair would disrupt traffic and could increase motorist road time as traffic patterns are forced to change.

“Research shows the use of 90,000-lb., six-axle semis would not increase stress on bridges at maximum weight compared with five-axle trailers. However, the 97,000- or 98,000-lb, six-axle semis would exceed current bridge formula limits and might cause stress,” the report indicates.

Additionally, removal of the bridge formula cap would allow minimal or no increase in GVW of a five-axle semi, but could allow vehicles with additional axles to operate substantially above 80,000 lbs. The 90,000- and 97,000-lb., six-axle semis were found to cause the same or less road damage than five-axles, while pavement costs were the same or lower for six-axle semis.

Better Soybean Transport Efficiency

Informa reports that soybean yields are expected to increase from a national average of 42.8 bushels per acre in 2009 to 53 bushels an acre in 2020. Total production as a result would rise from 3.225 billion bushels in 2009 to more than 3.974 billion bushels in 2020.

Based on that production forecast and assuming the weight threshold remains at 80,000 lbs. (900 bushels), the number of semi trips hauling soybeans to an initial location is projected to increase 39 percent from 2.8 million to 4.0 million in 2020. The number of truck trips in Iowa is expected to increase 42 percent and in Illinois to 39 percent.

About 80 percent of initial deliveries to elevators or off-farm storage locations occur via semi trucks and will rise to 90 percent by 2020.

Informa says using 97,000-lb., six-axle truck semitrailers would reduce the number of soybean loads nearly two percent from 4 million under the current weight limit to 3.9 million in 2020.

“The reduction in the number of truck trips will reduce the amount of fuel consumed. Based on various diesel fuel prices and change in fuel consumption, and number of truck trips required under a higher weight limit, soybean farmers could realize savings of between \$1.2 million with diesel prices at \$2 per gallon and nearly \$2.5 million with diesel priced at \$4 per gallon,” Informa economists estimate. “Total mileage saved from the farm to the grain elevator would be 2.4 million miles, based on 40-mile roundtrips. The reduced number of deliveries with higher weights could result in farmers gaining an entire day of productivity.”

Informa notes that almost all grain elevators are equipped to handle an increase in truck weights. Moves from initial off-farm elevators would decline by 35,000 trips for select Midwestern states (including Iowa and Illinois) by 2020. Total mileage saved from grain elevators to processor and exporter locations would be 3.5 million miles, based on 100-mile roundtrips.

“Most states allow heavy trucks on state and county roads, especially during harvest. For short moves, avoiding federal interstates and highways is manageable and the benefit of increased truck weight limits is marginal,” notes the report. “For longer distances, avoiding federal interstates and highways is difficult. Trucks must be loaded to the federal limit and cannot take advantage of state regulations. Longer hauls will benefit most from greater weight limits.”

The full STC study can be accessed at the STC’s website: www.soytransportation.org.



Freight Movement Matrix

According to the Department of Transportation, freight volume demand by all modes, which includes air, truck, rail and water, is expected to increase from 21.2 billion tons in 2007 to more than 37.2 billion by 2035. That’s an increase of 16 million tons or 75 percent.

Truck volumes are expected to register the largest increase – and more than the total increase of all other modes combined – rising from 12.9 billion tons in 2007 to 22.8 billion in 2035. Since soybeans and other ag products are harvested in geographically dispersed regions and often shipped less than a few hundred miles, trucks are often the only viable transportation method.

At the same time, the rail industry is becoming less of an interchangeable mode of transportation with trucking. Since 1980, the mileage in the nation’s railway system has declined by almost 23 percent. Railroads are increasingly adopting a business model premised on limited points of origin, limited points of destination, and longer trains that serve those locations, which means shippers in rural areas must truck commodities over greater distances for rail service.

“All of us in this country desire to have a strong, healthy economy. However, we have failed to provide a strong, healthy transportation system to enable our economy - particularly our rural economy - to thrive,” sums Dean Campbell, soybean farmer from Coulterville, Ill., and STC chair. “We need to find ways to increase the efficiency of all modes of transportation while not endangering fellow motorists or causing added stress on the existing infrastructure.”

Have Soy. Will Travel.

Journalists Learn About Importance of Soy



Soybean farmer, Rick Kimberley, shows participants the ins and outs of a soybean plant.

A group of food writers and journalists from around the nation gathered in Iowa earlier this month to learn about the emerging importance of soyfoods.

This was the tour's eighth year, which was started by Linda Funk, The Soyfoods Council executive director, back in 2001. Funk says the tour had two goals for its 13 participants.

"The first was really to get food writers to come into the state of Iowa and understand what it takes to grow soybeans and all the health benefits. And then, the second part of that is the application.

"How we actually take that soybean and make wholesome, delicious foods from those products," says Funk.

Participants had opportunities to learn about application and education through a series of visits with local farmers and chefs. The process of making tofu intrigued Barbie Perkins-Cooper, freelance writer from South Carolina.

"We met with a local chef and worked together to make our lunch," Perkins-Cooper says. "Which turned out to be fabulous, I think we did well."

The lunch was made at Des Moines Area Community College's Iowa Culinary Institute, where participants broke apart in teams and created several soy-based dishes including, pumpkin and miso soup, tofu parmesana and fudge cakes.

The participants also met with farmer Rick Kimberley and his wife Martha. The couple has been farming since the early 1970s. Rick explained modern agriculture practices to the group, most of which had never visited a farm.

Gail Bellamy, executive food editor at *Restaurant Hospitality*, says visiting the farm was eye-opening.

"We've heard a good blend of science and taste issues along with health aspects of research related to the field," Bellamy says. "Then being able to see the ag side of it all up close was great."

While attendees felt the tour was helpful, the closing speaker, Liz Sloan, brought together all the topics covered into something that was relatable. Sloan spoke on culinary and health trends – or how trends in soybeans and other foods work together.

"Sloan covered best selling new products, different age groups and what types of foods are important to them and how we should be looking to position soy to those age groups, especially younger kids," says Funk.

Overall, Funk says the tour was a success with bigger and brighter plans for next year.

"After hearing from Mark Messina, an expert on soybean and health research, and to have people go home and say 'Oh, I understand how this should be part of the restaurant industry, how consumers should start using it more and understand how to use soy for different age groups,'" Funk says. "You know it was a success."



The tour, celebrating its eighth year, had over a dozen participants from around the country.



Late Summer Images Tell a Lot About Crops

Aerial imagery taken in late summer can be vital in developing management strategies for specific farm fields and in evaluating different management practices that you use on your farm. It can show tile lines, traffic patterns and to help locate areas where crops are affected by diseases, insects or lodging.

Bare soil imagery from early spring can tell you a lot about soils and drainage, and imagery from corn fields taken before tasselling can help in assessing nutrient status of the crop. But to learn the most about the growing crop, aerial imagery must be collected when crop has the proper canopy, which is usually later in season.

Late season imagery can help you to see how dry the corn is so you can see differences between hybrids. Additionally, it can show nitrogen (N) stress in corn, as well as having other benefits.

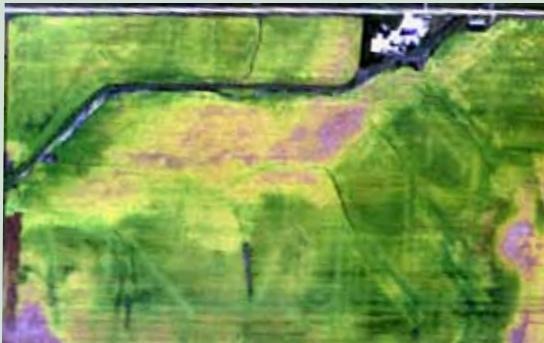
Aerial imagery also allows you to see your field with incredible detail. You can see individual wheel tracks in good quality images, which can help explain a lot about the effects of individual field operations.

It also allows you to monitor coverage of fungicide or insecticide applications, whether you put them on yourself or hired a commercial applicator for the job.

Another benefit of having aerial imagery is you can look at color infrared images of your fields to detect differences between products or practices. The images are made using near infrared light that is not visible to the human eye and that plants do not use for photosynthesis.

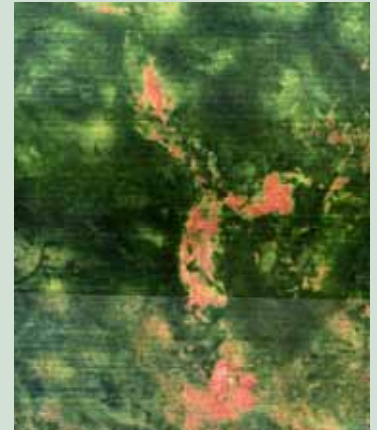
Overall, aerial imagery gives you another way to monitor your management strategies and implement new strategies if necessary. An example would be in a wet year to see if you should have replanted a couple of areas you did not. Early season decisions can be detected in aerial imagery later in the season.

Other options are to get time sequence photography over the same field. Having time series photographs allows you to see variability in soils that can affect different crops.



In this late-summer image of a soybean field, the plants in the center and lower right side of the field (lighter areas) have matured more than those in the rest of the field. The light colored linear patterns in this image are tile lines.

This field was affected by drought. You can tell it is drought because of the sharp contrasting lines.



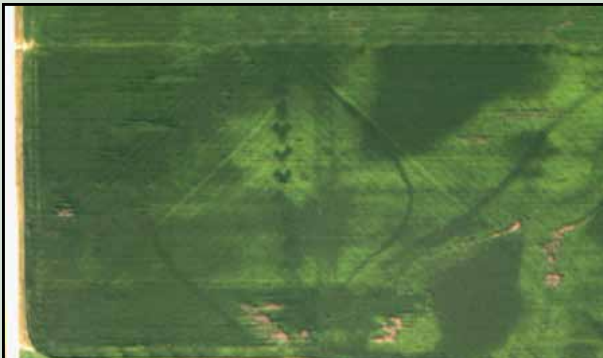
In the image below, tile lines are visible in the right side of the field and planter skips can be seen at the bottom left side of the field. In the lower center of the field, the darker patterns are where the field was replanted.



This picture is the same field as the one on the left, but is color infrared (CIR) instead of normal color. The tile lines, planter skips and replant are all still visible.

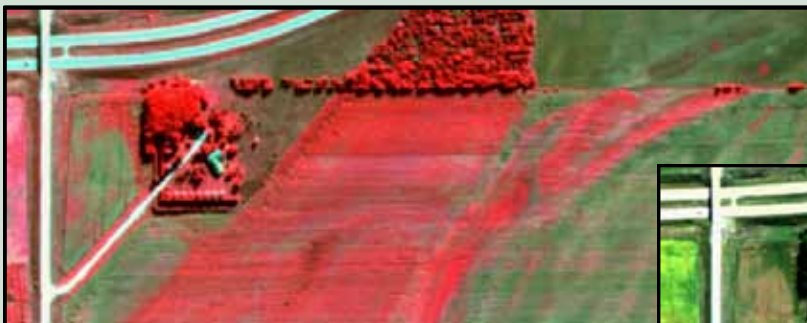
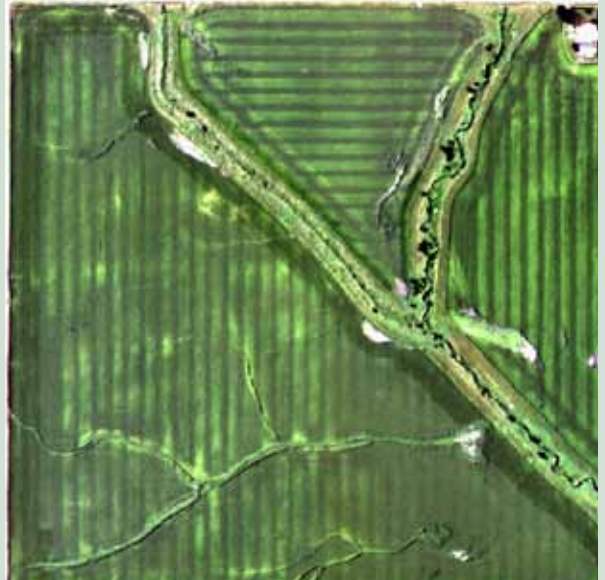


Some patterns are not related to equipment or crop inputs. The image on the left shows terraces in the field.



An umbilical cord was used to apply liquid hog manure in the field above. You can see the areas of overlap and where the manure was left on top of the ground.

Only one hybrid was planted in the field below. The differences are caused by misapplication of dry urea, which was applied mixed with P and K.



Left is a CIR image of a field with sand lenses. Water from a nearby river moved the soil around. Below is a normal color image of the previous field.



The field below had an application applied at an angle. Also, the rough areas in upper part suggest there are stand problems in the field, probably from lodging.



The image on the right shows several areas where the field was replanted, (twice in some places), and then parts of those areas were drowned out again.





Riding the Wave

Soy Enjoys Surging Worldwide Aquaculture Demand



Chinese crews harvest Pompano off the coast on Hainan Island, China.

PHOTOS COURTESY OF THE U.S. SOYBEAN EXPORT COUNCIL

Aquaculture may be one of the few industries enjoying double-digit growth this year, and U.S. soy is one of the key ingredients riding the wave of demand. With a 10 percent annual rise in production, aquaculture is the fastest growing sector of animal agriculture. Use of U.S. soy in fish feed rations has grown from nothing 20 years ago to about 220 million bushels today.

“The aquaculture industry is increasingly using plant proteins to culture fish, including soybean meal and soy protein concentrate, which is partly due to investments by U.S. farm-

ers through the soybean checkoff,” says Brent Babb, director of program development and communications, U.S. Soybean Export Council (USSEC). “The soy industry recognized the need for research with feed-based aquaculture technologies. We have conducted more than 150 feeding demonstrations worldwide to show soy’s nutritional properties and economical advantages.”

While the use of U.S. soybean meal and soy protein concentrate in fish rations has been focused in areas that include Asia, Latin America and Europe, China is by far the largest market.

“More than 60 percent of aquaculture production is found in China,” Babb says. “The Soy in Aquaculture program helped create the market through development, field testing and demonstration of soybean meal-based feeds. China’s freshwater aquaculture production has grown from less than five million metric tons to more than 20 million by alleviating the necessity for traditional animal protein sources, such as fishmeal, in most freshwater fish diets.”

Specifically, the Chinese aquaculture industry has advanced from traditional, manure-based production to modern, feed-based production of carp, tilapia,



catfish and other freshwater species. The move has provided domestic and international consumers with ready access to higher quality fish products at reasonable prices, while providing a growing market for soy.

In fact, Babb says soy products are a promising fit for the freshwater market. Soy can make up 50 percent or more of the feeds for carp and tilapia that comprise nearly two-thirds of Chinese freshwater aquaculture production. A three-year, checkoff-funded pond feeding study that concluded in 2008 demonstrated a 60 percent soy product, all-plant protein feed for grass carp yielded up to 65 percent more production and up to 50 percent greater profit when compared with a traditional Chinese system with feed and grass. Environmental impact was cut in half.

Other checkoff-funded freshwater feeding demonstrations in China have shown that a 55 percent soy diet for tilapia not only grow tilapia quickly and with a high feed conversion efficiency, but provides a healthy 2:1 ratio of Omega-6 and Omega-3 fatty acids. Another three-year series of trials confirmed the typical 20 percent fishmeal inclusion in fingerling feeds for carp and tilapia can be fully replaced with soy protein concentrate and reduce demand on limited fishmeal stocks. Soy-based feeds also blend soy and fish oils to further reduce use of fish oil stocks.

U.S. soybean farmer research efforts include marine fish species in China as well.

“We recently concluded a multi-year program with offshore cage production to raise such high value fish as pompano and sea bass in China. Lessons learned in China are now being extended to Southeast Asia, the Black Sea and in the near future, will be expanded to Latin America and the Caribbean,” Babb says. “These fast-growing fish species require a high inclusion of soy protein concentrate – which has 65 percent protein versus 48 percent in soybean meal. A diet where soybean meal and soy protein concentrate replaced all but 10 percent of the fishmeal was successfully demonstrated with pompano in offshore ocean cages in southern China from 2006 to 2008. When soy replaces some of the fish meal, the environmental benefits rise.”

Collectively, Babb notes reducing the requirement for fish meal and oil in aquaculture feeds cuts the environmental impact and increases industry sustainability. In Egypt, for example, tilapia have traditionally been cultured in the Nile River. The Egyptian government curtailed production due to pollution. Babb says U.S. soybean farmer-funded efforts are helping create more environmentally friendly production methods with soy feed to get production back up to speed.

“India is another country that is making great strides in commercial fish production,” he says. “They generally use ‘trash feed,’ but we are converting them to commercial soy-based floating

feeds. The Indian feed industry has invested millions in four new feed plants to make the feeds.”

Babb says the Soy in Aquaculture program is beginning to explore the possibilities for boosting key marine fish cultured in parts of Europe, the Middle East and Latin America. Studies in Spain in 2007 and 2008 demonstrated the protein contribution from fishmeal can be reduced to as low as 15 percent in the diet of gilthead sea bream with properly formulated soy feeds, and to 40 percent with European sea bass. High Omega-3 fatty acid soy oil is currently being tested as a fish oil replacement for yellowtail fish cultured in offshore cages in Hawaii.

“Latin America offers promise with its large shrimp and tilapia production. Since U.S. farmers already enjoy significant market share, a higher soy inclusion rate and the resulting fish imports back to the U.S. for consumption offer solid demand prospects for U.S. farmers,” he says.

Babb adds that soybean checkoff-funded research is underway at several universities and research institutions in the U.S. and abroad to find the highest soy inclusion levels that key marine fish and shrimp species can tolerate in their diets. The goal is to drive increasing demand and consumption of U.S. soy products in the aquaculture sector in the years ahead.

For additional information on the Soy in Aquaculture program, visit www.soyaqua.org.



Entomologists Clarify Soybean Aphid Treatment Thresholds

Recent advertisements by agribusinesses have reignited a discussion about when to apply insecticides to manage soybean aphid. The current recommendation from entomologists across the Midwest is to treat soybean aphid when 80 percent of the plants exceed 250 aphids per plant during bloom through seed set (R1-R5).

Erin Hodgson, Iowa State University (ISU) extension entomologist, and Matt O'Neal, ISU research entomologist, say this recommendation was developed from field research conducted over several years across multiple states and appears to be applicable to a wide range of growing regions in the Midwest. Additional testing of the 250 threshold continues, with comparisons to lower thresholds.

"Soybean aphid outbreaks in North America have been highly variable," Hodgson says. "2009 is a great example because there is a wide range of infestations. Some fields are at extremely low levels and others legitimately need to be treated to protect yield. Population growth cannot be predicted at planting so regular sampling in every field is essential for determining properly timed treatments."

Hodgson suggests looking at a minimum of 30 plants for every 50 acres, counting all the aphids on the plant to estimate the average density.

Hodgson and O'Neal say fields with low to moderate aphid problems can be regulated with predatory insects, like ladybeetles, but warn against spraying insecticides too early.

"Most insecticides used against soybean aphid will also kill these beneficial insects, destroying any possibility for biological control," O'Neal

says. "Spraying too early will knock down beneficial insects and give aphids and opportunity to flare."

As for insecticide treatments, O'Neal and Hodgson advise against using a tank-mix control.

"We do not recommend applying insecticides in a tank-mix to control soybean aphid," O'Neal says. "Tank-mixing with herbicides usually results in poor coverage for aphids. Use proper volume and pressure to reach aphids on the undersides of leaves and stems."

In Iowa and much of the North Central region, seed treatments have proven to be the least cost-effective method for managing soybean aphid.

"Spraying by calendar date or plant stage can significantly reduce aphid populations, but resurgence of aphids and other pests is possible later in the season," Hodgson says. "A well-timed foliar application at the threshold is typically the profitable management plan."

Hodgson also suggests using integrated pest management tools to minimize the potential for genetic resistance of aphids to major classes of insecticides.

"Soybean aphid-resistant varieties will be commercially available in 2010," Hodgson says. "This new technology will slow the growth potential for aphids and allow for a longer 'treatment window' to protect yield. In the future, economic thresholds are likely to increase as growers use aphid-resistant soybeans."

Dr. David Wright, Iowa Soybean Association director of contract research and strategic initiatives, says there is a lot of misleading information out there about the proper treatment of soybean aphid.

"The soybean checkoff has spent more than \$3.5 million on soybean aphid research and the current economic threshold recommended by ISU is the appropriate and most cost effective threshold for soybean growers," Wright says.

Close-up of *Aphis glycines* on buckthorn.



PHOTO COURTESY OF CHRIS DIFONZO, MICHIGAN STATE UNIVERSITY

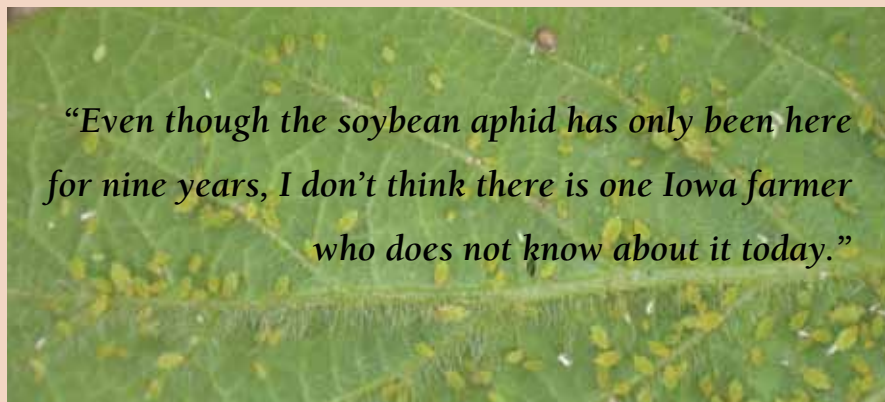


SOYBEAN APHID YEAR?

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With large soybean aphid populations in Iowa in both 2007 and 2008, now is the time to scout our fields extensively for this pest. At present, when this article was written, we do not know if it will be an aphid year. However, in 2008 we thought it would be an off year, and it turned out to be one of the worst years for aphid infestations we have ever experienced in Iowa. It is clear temperature, precipitation and crop growth stage are three variables – among many – that heavily influence the aphid. I dealt with aphids, which were found in both winter wheat and malting barley, in Denmark and England on a yearly basis. But, again, we did not have to spray every year. However, whether it is an aphid year or not doesn't really matter – It's all about scouting.

Even though the soybean aphid has only been here for nine years, I don't think there is one Iowa farmer who does not know about it today. There is no doubt soybean checkoff investments have paid off and there should not be any farmer in Iowa, or anywhere in the Midwest, who loses sleep over this pest. Soybean aphid is very easy to manage, but scouting is critical to managing it correctly. Much like other pests and pathogens, soybean aphids are very difficult to predict because they are so dependant on environmental conditions. In addition, many other variables, such as natural enemies and management practices, also influence the soybean aphid.



“Even though the soybean aphid has only been here for nine years, I don't think there is one Iowa farmer who does not know about it today.”

PHOTO COURTESY OF PALLE PEDERSEN.

Scouting should be initiated in the last week of June and conducted weekly until late August. When scouting for aphids in June or July, we will often just check the upper two or three trifoliolate leaves and the stem since the aphids are often found here during these months. However, as we approach August, the aphids will often move down the canopy and change from a green to a more whitish color. It is recommended to scout five locations per 20 acres and also to look for natural predators such as the multicolor Asian lady beetle. Lady beetles are often a good indicator aphids are present. Entomologists from the upper Midwest have documented the economic threshold at 250 aphids per plant.

Many different insecticides are available and will do a great job managing soybean aphids. But, it's all about timing – do not spray too early or too late. Spraying below economic thresholds is not recommended and is not economically feasible. A lot of this is related to integrated pest management principles. Treating soybean fields prophylactically, many of which may not have economic

aphid populations, will often worsen conditions since the insecticides we use do not just kill the aphids but their natural enemies as well. Often, we underestimate the presence of natural enemies. The multicolor Asian lady beetle, for example, is capable of eating up to 200 aphids per day. These predators probably will be most helpful when fields have low populations.

Yield-damaging aphid populations cannot be detected from the road. Early in the season, aphids tend to be located on new growth, and examining the upper trifoliolate is a quick way to look for the pest. Cast skins, honeydew, ants, ladybugs and sooty mold are some of the best indicators that aphids are present. All of these can be seen without a magnifying lens. However, when this evidence is apparent without a magnifying lens, the aphids have probably been present in the field for a while and populations may already be well above the threshold.

For more information on soybean management practices, please visit my Web site at www.soybeanmanagement.info.