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“Top Ways Microbes Cause Fuel Headaches For Farm and Agriculture (And What To Do About Them)”

The fuels in use today are not the same as they used to be. More than half of all users aren't happy with the fuels they use. If you're unhappy or having fuel issues that cost time and money, it is your chance to learn from the experts and shine the light on what's causing your problems and (most importantly) how to fix them.

Whether you've got a farm or agricultural business or any other kind of business, really, the ball is in your court. It's up to you to take the steps to fix your own problems. Read on and learn more here.



1. **Microbes like fungus, bacteria and mold grow more quickly in today's fuels, including biodiesel.**

Good fuel housekeeping practices always involve staying in control of water accumulation in storage tanks, because water is the key ingredient needed for microbes to grow and thrive. Microbes grow most robustly when there's available water in the tank and the fuel temperature is between 50 and 100 degrees F, give or take. Once a colony is established in a tank or fuel system, they can quickly cause major problems (from filter plugging to destruction of fuel stability and quality). What's more, they're impossible to get rid of without using a potent biocide treatment to kill them.

Microbial growth from fungus, bacteria and mold are associated with diesel fuel storage, but they grow just as easily, if not more quickly, when you have a portion of bio-added to that diesel fuel. Microbes need water to live and they feed off elements of the diesel fuel at the same time. Biodiesel FAME



– the methyl ester component that defines “biodiesel” – provides an excellent food source for all kinds of microbes. So it's no surprise that biodiesel blends, ranging from 2% biodiesel (called B2) all the way up through 100% biodiesel (B100) develop and support the unwanted growth of bacteria, yeast and mold more easily than typical stored diesel fuel. And if that's the fuel you use, there's an opportunity for you to stay ahead of the curve of preventing problems in your farm or agricultural fuel.

Your Action Items: It's essential to be vigilant about the presence of water in your tanks and observing possible signs of microbial infestation. The first and most noticeable sign of this problem from an operational standpoint is a rise in the rate of filter plugging. Then look for the presence of significant water in the bottom of the tank. If those two things check out, it's time for remedial action.



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2. Blame the Government - Regulations have played a key part in the rise in microbial problems in farm fuel

This is not to say that the government is causing these problems, but rather, that a couple of pieces of legislation have changed the fuel environment such that microbial problems are more widespread than ever before.

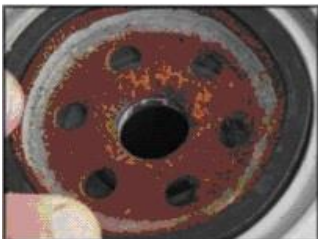
The big one is the mandate for the use of ultra-low sulfur diesel fuel. Once they took the sulfur out, the nature and composition of the fuel was fundamentally changed. There's much lower aromatic content in the diesel fuel, making it much less resistant to microbial growth than before. This means your farm is more likely to develop microbial fuel problems even you do a good job of controlling water. That's not to say this means water-controlling treatments have no use, but the chances of problems developing are pretty high even as their use is higher than ever. All of this is direct result of the mandate to clean the sulfur out of diesel fuel.

The other mandate is the Renewable Fuels mandate. Every year Congress mandates a certain volume of renewable fuels (ethanol and biodiesel) to be used in the national fuel supply. Many places are required or "encouraged" to use a certain amount of biofuels in their fuel supply. These biofuels like ethanol and biodiesel are even more likely to develop microbial problems than other fuels.

Your Action Plan: Being prepared with facts can educate you and give you a sense of what to expect. When the problems appear, it's easier to correctly assign the blame for the problem, which is on the fuel characteristics, not on you. Beyond just arming yourself with knowledge, consider looking into microbial testing materials and solutions like ATP Testing and biocides. It's bad enough to have an unexpected problem arise. But if you don't know what to do about this unexpected problem, your tensions can triple. Knowing that you have real options for real solutions can give you a lot of peace of mind.

3. If your farm has microbe problems, it probably has corrosion problems, too.

Even if you haven't noticed corrosion issues, it's only a matter of time. Microbes cause system corrosion for multiple reasons. They give off acidic byproducts during their life cycle that not only corrode materials below the fuel line, the acids can evaporate and reappear in the vapor space, causing damage there. They produce biofilms that settle on tank surfaces and cause galvanic corrosion of the metals. Those are reasons enough to take whatever steps are necessary to get rid of any microbe problem you have. Sure, microbes can plug filters, and replacing filters is a hassle and an expense. You may decide to live with that. But the longer the microbes persist in your system, the more damage they are causing to the more expensive parts of the farm's fuel storage and distribution system. And that's when the big bills start to come in.





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Your Action Item: Knowing that this is true should only double your resolve for staying on top of this problem before it starts resulting in serious costs for your far operation.

4. Getting rid of bacteria and fungi in farm fuel requires specific action

It used to be that simply controlling water accumulation was enough to prevent most microbe problems in agricultural fuel (See point #2). And it's still important to maintain proper housekeeping in this regard, because you will prevent or slow down the growth of some microbe problems this way. But not nearly all of them by any means. Once you notice this kind of problem, you have to use a biocide to actually kill the microbes, followed by either filtering the fuel to get rid of the dead microbes or letting them settle to the bottom of the tank before using the fuel. The biocide use is the key part of the equation. You simply cannot get rid of a microbe problem in any kind of fuel (biodiesel, diesel or even ethanol) without it.



Your Action Item: Because it's a problem that can rack up serious expense, the best practice recommendation is both to treat with biocide and then do a microbe test to confirm that it's been fixed.

Biocides aren't like the gas or diesel additives you normally buy off the shelf at the local Co-op. They are very highly regulated and controlled because of the nature of what they are – they kill living organisms. So there aren't many biocide formulas out there because of this. Bell Performance carries a biocide called **Bellicide** but we're not here to tell you why (or whether) you should buy it. Rather, when deciding on a biocide to treat your farm's essential fuel, look for some important features:

- 1) It should be concentrated, with treat rates of no more than 1 oz to 40 gallons for "shock treatment" and a lower dose for maintenance.
- 2) It should be effective in both the water phase and the fuel phase. This is essential because the biocide is going to encounter both in the tank, and there are certain biocides out there that are actually deactivated in water.
- 3) It should maintain a kill rate for a long time. This speaks to the power and effectiveness of the biocide – they get "used up" as they encounter microbes in the fuel. So if a biocide keeps killing for a longer time, it means it's more effective, pound for pound, than something that doesn't.

Using a biocide requires more attention than just dumping it in the top of a tank and leaving it. A biocide is only effective when it comes in contact with the microbes in the tank. That means the fuel needs to be circulated. If a biocide supplier can't show you how to do that, you're better off going with one that will, because there are few things worse than spending money to solve a serious problem and then not seeing it work because you didn't know how to properly apply it.



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4) It must have two registration numbers visible on its label – an “EPA Registration Number” and an “EPA Establishment Number”. That’s one way you can tell if something is actually a legally registered biocide instead of something that’s dishonestly (and illegally) claiming to be a biocide. If it doesn’t have those two numbers, it’s not a biocide.

Finally, let’s talk about microbial testing. It’s important and essential to use biocide to knock out microbes in agricultural fuel. But testing is the only way to know if that’s been done successfully. There are microbe tests known as “in-field” tests, that enable you to take a sample of your fuel and test it. Depending on how fast the test is, you get results in a week or an hour. The best kind of testing, when you consider accuracy and consistency, is ATP-By-Filtration. But most people don’t have the equipment to do that.



Companies like Bell Performance will get around this hurdle by offering test kits that have sampling container for you to put a fuel sample in, box it up (the box is supplied), and ship it back to them. They do the testing at their lab and report the results back to you.

You can then have confidence that you solved your problem OR you have the equally valuable knowledge that you may need to do another biocide treatment so the problem is really solved the second time around.