
Interview: Dr. Bill Gazaway, Plant Pathologist

The EDB ban hits soybean farmers, forebodes U.S. food shortages

From the headlines in the national media, the public might assume that when the Environmental Protection Agency banned the use of the pesticide EDB for stored grain and grain milling equipment on Feb. 3, 1984, a grave risk was eliminated from our daily lives. The opposite is the case: as the Alabama case presented here demonstrates, *not* using the pesticide ethylene dibromide is probably a greater risk.

The real damage to consumers over the chemical EDB is that the American people have come to believe news reporters and environmentalists instead of scientists about the risks involved from modern technologies like pesticides. What the media scare stories don't tell you about the traces of EDB found in processed grain products like cake mix and flour, is that 90% or more of the tiny traces of the chemical is "cooked out" when the product is baked.

The scaremongers also don't tell you that although EDB has been used for 40 years, there is no scientific evidence showing that small amounts of EDB—parts per billion—cause cancer in humans, although it is a carcinogen in laboratory rats. According to one scientist at the University of California, a rat would have to eat a 1,000-pound muffin laced with 5,000 parts per billion of EDB every day in order to increase its chances of getting cancer from a normal 30% to 50%.

The EPA has set a suggested standard of 30 parts per billion for the allowable residue of EDB in ready-to-eat grain products. One part per billion is like 1 pinch of salt in 10 tons of potato chips, or 1 second in 32 years, or 1 inch out of 16,000 miles.

There is no question that EDB is a toxic chemical. It efficiently kills bugs, and it is particularly effective as a fumigant for stored grain, elimination of fruit flies from harvested citrus fruits, and as a soil fumigant for row plants like peanuts or soy beans.

Has this usage of EDB increased the risk of cancer to the population? The inventor of the international test used to determine whether substances are carcinogenic to humans,

Dr. Bruce Ames, who heads the biochemistry department at the University of California, says that eating a peanut-butter sandwich is more risky than eating EDB-laced muffins. Why? Because of the natural carcinogens potentially present in peanut butter. "We're getting 10,000 times more of nature's pesticides than we are of man-made pesticides," say Ames.

EDB was suspended as a soil fumigant in September 1983. In the interview below, Dr. Bill Gazaway discusses how the ban will severely affect the soybean crop in Alabama, because it is the most effective and economical pesticide that can be used there for soil fumigation. Gazaway is a plant pathologist at Auburn University in Alabama, who works with the Alabama Cooperative Extension Service advising farmers and agribusiness throughout the state on pesticides and plant disease.

Q: How will the EDB decision affect Alabama's soybean growers?

A: Presently we're using EDB quite extensively in the southern tier of the state, where the peanut root-knot and soybean-cyst nematodes are the primary problems.

Statewide, roughly 28.6% of all soybean fields are infested with these soybean cyst nematodes, and we just ran a recent survey which shows that most of the soybean fields in the southern area are infested with the root-knot nematode. This means that in our major producing areas in the south, you almost cannot grow soybeans without running into the root-knot nematode problem.

That does indeed create a serious problem, since most of our soybean varieties do not have good resistance to root-knot nematodes, particularly the peanut root-knot nematode. This means that either we're going to have to rotate with other crops, or we're going to have to use nematocides. And the only effective nematocides against high cyst or root-knot infestations are the ethylene dibromide (EDB) compounds.

What it boils down to is that we are out of effective weapons to combat this problem, particularly in southern

Alabama, and this is getting to be such a problem that frankly I don't know whether our soybean farmers are going to survive.

Q: You mentioned that crop rotation could be an alternative, and I know that in Mississippi crop rotation was effectively used to combat both the cyst nematode and stem-canker disease.

A: Yes, but that is not the complete story. Rotation can be used to combat the soybean-cyst nematode, which predominates in Mississippi. In Alabama, the root-knot predominates in the southern counties where a major portion of our soybeans are grown.

For one thing, the soybean-cyst nematode feeds and multiplies on relatively few other host plants or crops, which makes crop rotation effective. In contrast, root-knot nematodes attack many different crops, which means that rotation is not as good in trying to control the root-knot as it is in controlling soybean-cyst nematodes.

The same is true with use of resistant varieties. We simply are finding out in Alabama that some of the root-knot-tolerant or so-called resistant varieties are not holding up under the pressure that we have in Alabama.

When rotation is not effective, when resistance is not effective, what do we have left? We have nematocides—and the only nematocide that is effective, again, is EDB.

Q: As of September, the EPA banned using EDB. And I understand the situation is further complicated by the spread of the stem-canker disease.

A: Stem canker is an alarming complicating factor in south Alabama where the cyst nematode is a problem. Effectively, what stem canker does is negate all the weapons that we had formerly used to control soybean cyst. You can rotate your crops, but the problem is to find a market for that crop with which you're rotating. A farmer says, "Oh, yes, we'd like to rotate, but what are we going to do with it?" A lot of our farmers, particularly the smaller farmers, are simply not set up to rotate crops. . . . They simply are one-crop farms. I realize that that is not a good system no matter what you do, but still, that's the fact.

With stem canker coming in, they could have used—could have, I repeat, used—EDB to control cyst and root-knot, which would have allowed them to continue using stem canker resistant varieties.

Q: So in order to use a soybean variety that's resistant against stem canker, the farmer needs EDB?

A: Yes, the two soybean varieties resistant to stem canker are susceptible to the soybean cyst and peanut root knot so they cannot be used effectively where high populations of these nematodes are present.

Q: How prevalent is stem canker?

A: Stem canker is present in every major soybean producing county in the state except for Baldwin and Mobile counties on the Gulf. The counties to the north of there are heavily infested with stem canker so it's probably just a matter of time before these two counties are infested.

Q: What monetary loss do you expect from the EDB ban?

A: We're assuming this year that the *gross* loss is approaching 11.7 million bushels, and if you figure the cost at \$6 a bushel, that is a \$70.5 million loss. At \$7 a bushel, that is an \$82.3 million loss. Now of course, you would have to subtract the cost of ethylene dibromide. If you were to subtract that, the net return would range between roughly \$60 million and \$70 million in losses.

Q: In terms of the economy of the state, what does this mean?

A: It's our major crop in the state. So it simply would hit us very, very hard. It would be very difficult for us to recover that loss.

Q: What do the farmers plan to do?

A: The farmers right now don't know what to do. We're in a situation right now where we're going to try to look at a field-by-field situation. We're going to certainly ask them to rotate as best they can, knowing full well that this is not going to be the complete answer, because of the difficulty of rotating in those fields in south Alabama where there are either mixed populations of root-knot and cyst nematodes, or where you have straight populations of root-knot nematodes.

Otherwise, I don't know; I simply don't know what we're going to do at this time. . . . These people are going to be in trouble.

I was rather optimistic about the eventual outcome of the problems that we're now experiencing, simply because once people start paying extremely high prices at the grocery and then once food shortages develop, we will have a return to rationality.

Q: But it seems to me that realization is going to hit too late. With agriculture, a start-up time is needed. If you kill off your livestock, for instance, as cattlemen are doing, it takes a good 18 months before you can build back the herd.

A: I think the lack of sensitivity on the part of the general public to the plight of our farmers is incredible. They've taken farmers for granted much too long. It's the one part of the capitalist system that has seemed to work, up until now. . . . Sooner or later the farmers are simply going to come to their end. And we're going to develop food shortages. There will be a reversal, but I don't know whether it will be too late or not.