

**Dennis Keeney, Narrator**

**Anneliese Abbott, Interviewer**

**June 22, 2021**

**Location: Dennis Keeney's home, Madison, Wisconsin**

**DK** = Dennis Keeney

**AA** = Anneliese Abbott

**AA:** All right. So this is Anneliese Abbott interviewing Dennis Keeney on June 22, 2021. So hello, Dennis! Thank you for letting me interview you today.

**DK:** My pleasure.

**AA:** All right. So we can go ahead and get started. I see you've already got your answers typed up or you've already got a list of questions with answers and everything, so why don't you just start with a little bit about your background.

**DK:** Okay. My background was, I'm 84 years old, so I've seen a few days and a lot of agriculture. Started out on an Iowa farm. I got to know farming really quickly because we were always short of help it seemed like, so I was, even at age 5 I was starting to do a little bit, things like helping my grandpa plant corn on it with the horses and that sort of thing. So I saw a little old-time agriculture. Went to, stayed with the farm until 18 when I graduated from high school, went to Iowa State College. And it turned into Iowa State University just before I graduated. During that time I kind of struggled with what I should be. Ended up in soil science, and that's what I stayed with. There were several places I could have gone for a master's, but Wisconsin had a lot of appeal. So I got my master's degree here in chemistry, soil chemistry. Then I had a chance to go back to Iowa State to work with a world-renowned organic chemist, and I went with him. So I ended up with a PhD in soil organic chemistry and biochemistry.

And came back to Wisconsin. They had an opening in soil science here. They really wanted somebody that would continue in that, in my program, because they didn't have anybody in this particular organic area. I ended up here, sort of being a generalist in doing research in all sorts, in the field, in the laboratory. It went well, it went very well. It kind of ruined my life when I went to New Zealand for a year. My career track took a flatnose there. And I saw what the world was like from the other side of the coin, the way they did their agriculture. And how they valued soils. So it was pastures and that sort of thing, that's what they worked in. They very much valued soil organic matter. And they were really forward-thinking in terms of what we were doing. And I came back here and really couldn't get settled down again. So about 6 or so years later we took the job at Iowa State. It was one of those cases where a sabbatical did what it's supposed to do, it changed your career. But it also led to the divergence in where we lived. I didn't want to move. It was too much fun here. I knew what Ames was like. But we did the move anyway. (3:25)

And the reason I moved was the legislature had just passed legislation to start the Leopold Center for Sustainable Agriculture. At that time Iowa was just discovering that it had a

lot of nitrate in their wells. And also pesticides. So there was blame being cast all over the place. But agriculture was not willing to take the blame. "It's not me," they kept saying. But there was quite a cry for research on this area. And the legislators, especially a guy called Paul Johnson, who died not long ago, put together a bill funding the Leopold Center through taxes on fertilizers and pesticides and some state monies. It had—in those days especially—a very adequate budget. That was my job right off the bat, was to get into groundwater research, which I had been doing at Wisconsin anyway. And we kind of went from there. But I knew sustainable agriculture was not water quality only, way more than that. Grassroot people knew that, they didn't seem to grasp that issue. But when I began to try to put that together, I had to do a lot of convincing. (4:54)

So I started the Leopold Center just with a desk, a chair, and that was it. I had to build it from there, hired the staff, built the programs. It was fun, it was a lot of fun. But along the way a lot of resistance, too, to what I was doing. So I had to also be a PR person and frankly just do a lot of talking to the right people at the right time and that sort of thing. Turned out I was kind of a natural politician, and from that standpoint, I sort of hated to be a politician, but as far as getting on the committees or whatever and doing the schmoozing it took to open the gates wide, I did quite a bit of that. So we got the program set up at Leopold Center. It was quite unique because nobody else had looked at that kind of an issue from the university standpoint. And I'll skip all the good stuff; the good stuff is now. But we'll skip that and just say I retired end of 2000. The Leopold Center was closed by the legislature in about 2018, something like that. Just closed down. They took all the money away. And that was a huge political decision. And a lot of people are still smarting over that one. But fortunately I was up here and nicely retired, away from the battle. I didn't want to speak out, but I didn't. I spoke out a lot before that, especially here at Wisconsin, about the sustainable ag program here. And it took some convincing that we could do that here. I thought we could do it better actually than Iowa. But when I left they were starting to build one. So had that been built I probably would have stayed. (7:00)

The farming methods that I was involved in in those days were really evolving. We started out with McCormick reapers and that sort of thing because powered tractors were just coming in. The old model AC, Allis-Chalmers, that's what I first drove. But they were the kind of tractors out there in those days. Diesel tractors came in about the time I left. And that changed agriculture a lot, because diesel was just a tremendous increase in power, a lot less fuel use, a lot better designs. The agriculture of those days was pretty straightforward. It was corn-soybeans straight, very little contouring. Not much at all in paying attention to organic matter.

You'll see in the book when you read that that even though I was taught at Wisconsin, and later on sort of taught I think, that soil was a mechanical media. It was not a living organism. And organic matter wasn't key to the chemistry of it. And the fact that they had ions floating around, nitrogen was sort of ignored. But when nitrate began to be a real issue, in politics as well as Iowa, both water quality and health problems, they began to think organic matter might be part of this. I was early in the game of sustainable agriculture. I think it wasn't really invented too much before that. Of course Robert Rodale was really the person that got things going. Before that there were some other philosophers that kind of recognized organic matter as being very important, that the way we crop the soils, the way we put pesticides on them, the way we just plowed them too often, and as a result hurting the organic matter levels. But the farming community didn't pay much attention. And the university didn't pay any attention at all. (9:42)

I recall a seminar when I was still in my master's degree here where they read a letter from an organic farmer complaining about pesticides killing the earthworms. And that was

laughed out of the room. They just had a very low regard. I wasn't a convert at all. But it took time, and I say New Zealand kind of helped me be a convert as I came to look and see what organic matter had done for them. Soils that had absolutely no organic matter in them, and they would put on pasture and sheep and cattle, and the organic matter would build up a lot. That could be done here. But that was kind of the history of it. I went to, out of research progress here in terms of how I set up the work for nitrate leaching especially up in the central sands. They were a big problem. So we worked on it quite a bit up there. The pesticides also showed up. There was one time when I would do seminars on how they were over-fertilizing the potatoes, and irrigating with their own time because they didn't want to flush the nitrate back down into the groundwater. They were just mining the groundwater then, and it was building up the nitrate levels. (11:21)

It finally got me disinvited from doing seminars in Sand County. We finally realized then that people who were listening a little more to what you're saying than you thought they were, and that science wasn't as important as the image that was left over. So I kind of stayed out of that. I wanted to be tenured and all that sort of thing, so you didn't bite the hand that was feeding you. That thought sort of kept going through my head when I was at the Leopold Center, that we could do something different. But Iowa is an entirely different kettle of fish. Are you familiar with Iowa? (12:00)

**AA:** Slightly. I don't know everything about it.

**DK:** Yep. It's nothing like here except for southern Wisconsin has some similarities. But once you get a little beyond Dubuque, you're looking at an entirely different agriculture. And at different soils. Those soils are deep, had tons of organic matter, they'd been built through the prairie. And Iowa had built its philosophy, and still does, on corn and soybean. They produce as much as they can. And they can talk a lot about third crops and that sort of thing, but essentially the government supports only corn and soybean. It's the crop that has, the only one that has real markets. And when they ran out of markets for corn, they had too much of it, they invented ethanol. And that used—still does—a lot of corn. It's a ridiculous thing to do because you're just, you're actually losing energy when you make ethanol. That I preached against, but that didn't get me anywhere either. It got me disinvited from talking about ethanol. But it just shows how their world is built around these two crops. Of course they have a lot of hogs. And hogs create a lot of manure. And manure is hard to manage, and there's a lot of nitrate pollution out of that. And phosphorus as well. Iowa doesn't have any natural waters left that are not polluted pretty badly. There's no place to try and do too much recreation. (13:52)

So stepping into that environment, the state that has absolutely no thought of cutting back on its corn and soybean, and an industry that has only the bottom line on its thought. They have the seed industry, which wants to sell more seed; the pesticide industry, that wants to sell more pesticides; and the two mated together, they got the Roundup-Ready type of soybean and corn. The whole thing is kind of melded together now to be one huge industry. There's the ag mechanization industry down there, John Deere, those companies, that absolutely has to have more sales. So they're all for more corn and soybean. Even to this day when they tried to take them to court, the philosophy, the myth that industry could do more to help, make standards we could cut down on nitrate pollution, the courts ruled that out. The industry fights it tooth and nail. I was going to be a witness in the trial. We had a pretty good chance, I think, of getting some

good rulings. They found a way to throw it out through legal shenanigans. The industry was scared. (15:31)

Well, anyway, the Leopold Center was just a heaven-sent chance. I'd never seen anything like this. Nobody had. I was president of the American Society of Agronomy at the time, had been president of the Soil Science Society, I had a good reputation for my science. I had published on the order of 200 papers. And I was on my way probably to some pretty good positions at the higher levels of the university. All of that didn't seem to matter. I got very bored with this whole situation and wanted a change in venue. You can call it one of those change in life things, that mid-fifties type of thing when you're wanting something different. Well, whatever it was, that's what I did. And I thoroughly enjoyed digging into something new. It was a tough move. A lot of controversy when I left. I started to make some inroads to the sustainable ag groups here and got to know them pretty well. And when I left they were very unhappy with the college not trying to keep me on. The college didn't care, they thought I was probably getting in the way, so they were not hurting too much to get rid of me, even though I had a large research program and that sort of thing. I think they could probably tell I was going to be trouble down the road. Some of it was good trouble, but it was trouble. (17:14)

So when I got to Iowa and had to open up the center with nothing on the plate, the whole thing that gets funding, I was called about everything in the paper that you can imagine. The usual groups took after me because some saw me as just a protégé of Iowa State, just another soil scientist. Others saw me as maybe the whole Leopold Center would hope was what we did. But I managed to soothe the feelings of Farm Bureau, which is the big power in the state. They say that Iowa State is run by four core groups. None of them have to do with the university. They are run by corn, by soybean—maybe five groups—corn, soybean, cattle, pigs, and Farm Bureau. You put those five together, they're a powerhouse. The dean doesn't stand a chance, no matter how good they are. They will simply take you into the back room and whack you a few times until you either lose your budget or you come around. I knew if I had those groups against me I didn't stand a chance. So I tried to get those on my side, and succeeded pretty well for a while. Until Farm Bureau had some change of power, and that was kind of the downturn for my career. I started really having the dean go after me in the wrong times and in the wrong places. You can't really fight back in those situations. You can't win in the press—not that the press wouldn't support you, but the press can't do much. So you're up there, the higher level power politics of Iowa, which is not a fun place to be. (19:22)

But getting the center started, getting the concept of the good, solid interdisciplinary program going, not just one on paper. We had a research grants program, then we had an interdisciplinary program which is called "teams." The teams worked together on projects such as riparian zone improvement, cattle housing, hog housing, water quality work. There would be different teams of disciplines put together. And I would give someone in the group funding to do that work part-time so it wouldn't take down their career. And we got some good teams going, got some good awards for some of the stuff we were doing. It wasn't stuff that would hurt Iowa. Riparian work was especially good, because Iowa was simply ditching itself. Iowa is a series of ditches, and they're taking the water from the tile lines. Iowa's completely interspersed with tile lines. In the main part of the state, not in the hilly part. And the tile lines were where the nitrate was coming from. So if you could work through slowing that water down, you get denitrification, you get things cleaned up a little more. That was a positive. And it went well, I don't think anybody worked against that one. Did some work on pesticides, had a small project that showed that use of pesticides to kill milkweed was cutting down on the monarch butterfly.

Common sense. That person didn't last too long. He was headed out pretty soon to get another job. That's how things worked there. There wasn't a lot to say about tenure if you did something that the agriculture didn't like. (21:45)

The center came together pretty well. We had to fight for space. We finally got good space. I think the administration thought they could choke us to death by not giving us any office space. I ended up having to go to the legislature after dark and getting that sorted out. Which didn't make the dean very happy with what I did. And there's a law against that, but what the heck? So we got a pretty good program in sustainable agriculture, probably the best in the world. And the fact that we started early and really plowing the way for what the word meant got me a lot of attention and a lot of fame. And I traveled all over the world. I could give a talk in Japan and a talk in the United States about the same week. Got to Europe quite a bit. Got to Russia several times. China a lot. And that was nice, too. My wife got to travel with me some. She got the bug for traveling, and once I retired we just kept traveling. So we did travel a lot till now. (23:01)

So we were preaching this whole thing about organic matter. It kept bothering me that I couldn't get people to listen, to figure that out. I think they are now. But I could see where that whole philosophy was coming from, the one that we used to laugh at and make fun of. Earthworms? Who needs earthworms? And giving talks all over the place, I was still the president of the American Society of Agronomy, and that was a big job. And that's changed quite a bit now, but then it was really a big job. I did some other things, got into the Water Resources Center for a while. It was a busy time. I would supervise people to help me out, and that took a while to find the right person to be your second-in-charge. You had to have someone second-in-charge who was good, knew what they were doing, could work with the faculty, but also who didn't want to take over your job. Those two qualities were—I found one. And she was the best thing you could see. (24:23)

My philosophies on farming as related to organic agriculture haven't changed a lot. I think there's a lot of room for both of them. Organic is harder to define. I have a new place to learn, and that's my granddaughter and her husband are farming—that's them right up there now [on a digital photo frame]—are farming in southwest Wisconsin. And they're actually doing beef grazing. No fertilizers or pesticides. They're converting this rundown, hilly farm into a very prosperous grass farm. And he knows how to do it. They bought a little land that was corn for years down there. He immediately turned it into a feedlot, with cows' manure turning into the base for the organic matter there. And now it's a beautiful prairie. Those things can be done.

Some of the names that I came across over the years that I liked. This guy called Chuck Francis in Nebraska—he's probably completely retired—John Ikerd in Missouri—he's probably still active. There's a guy in Michigan, but I can't remember his name. Rick Klemme here at Wisconsin. When I left, the Center for Integrated Agricultural Systems—you've probably heard of that one, CIAS—that center's still going, and I'm proud of the school for allowing that. Rick was the first director. That's what a lot of people thought I should be doing. MISA is the Minnesota Institute for Sustainable Agriculture. I took a part-time job after retirement up in Minnesota and worked with the people up there in some nonprofit groups. MISA was one of the groups I worked with. There were several names up there, I can't remember their names right now, but these are people if you wanted to contact from outside.

Robert Rodale was the head of the Rodale farms. His dad had been the first one to really write about this topic, *Farmers of Forty Centuries*, that was a book about China. So he had traveled to China and written this book. Bob really wanted to trace his dad's footsteps in China,

so he put together a people tour. And I was on it, fortunately. And we went throughout China, probably spent three weeks traveling. In those days it was a different China. There weren't the traffic jams and whatever, the streets were quiet, just the tinkling of bicycles, that sort of thing. Loved that place. So after that tour, it was in Singapore or some place like that, we said goodbye to Bob, and he went on up to Russia to establish, they had an organic agriculture book, or perhaps it was a monthly. And he went up there to establish that, and shortly after he got there the car he was in was hit by a tank and he was killed. So he died early. (28:27)

Farm agriculture, strict agriculture was afraid of people like this. It turned out that later on that people worked with him gave quite a few talks. I'm sure he would have given quite a few talks professionally at the society meetings. They began to grasp what was going on. He was one of the most wonderful people. There were a lot of earlier people, if you've read them, in the business. I don't remember their names, but I could look them up. Some of them would be in that book. But they influenced only a few people. They were mostly garden-level. Not farmers. The difference is pretty major. It's easy to be an organic gardener. Very hard to be an organic farmer. You can't be an organic farmer and grow soybeans around here. There's just too many weeds. So if you do it, you're going to have a very low yield. You have to really manage it extremely well. Organic soybeans are a very high-cost. About the same with corn. And they now have a lot of corn coming out of South America, Argentina, that area. That's all labeled organic, and it's mostly bogus. (30:03)

But anyway, Rodale was part of that. Ikerd was very good at education. They had programs in Illinois, which didn't last long. Mostly the agriculture institutions didn't like to support sustainable agriculture. This was a current against their funding source. So they would, if they had to have them, they would turn them over into a not-for-profit group, work with them. Would the Leopold Center have lasted longer if we had done that? Maybe. We don't know. There are a group of five of us who stay in touch a lot and talk about what's going on, and we talk about this new webinar that's coming on tomorrow. Mostly in disparaging terms, because we don't trust the university to tell the truth. And they won't. (31:13)

Anyway, there were good people out there. There were a lot of people in the USDA, and I can't remember the name of one fellow who died early, died of a cancer, there's people like that that would really have made a difference, like Bob, but they didn't live long enough. USDA was trying in those days. They were the ones that put out that first organic agriculture report, that came out of the USDA—I can't remember the name of it—anyway, they ended up with Paul Johnson as their secretary of agriculture, or the chair, and he made the change from Soil Conservation Society to Soil and Water Conservation Society. Paul was another great guy and would be a tremendous force for us, but he had a tractor accident, broke his back and his neck. He fought that for a decade trying to make it, but it just kept getting worse. So he passed away just in May. We'll have a memorial for him next month. (32:30)

Another guy was Eli Dabers. Paul was a driving force behind this. He wanted the water quality act, but he did not want it funded as water quality, he wanted it funded bigger than that. Very visionary person, very wide-spoken. And he was the one who put together a team that managed through the Democratic house and senate too to get the Leopold Center passed. Republican Governor was in charge of the, was there, he was signing the bill, it was very unusual he signed that bill. And he stayed with supporting the center through most of the worst of it. So I got to know him pretty well. So the state, federal government, Iowa State, and the farmers were all tied into this thing.

Before the Leopold Center was passed, before I came to Iowa, there was a group getting put together called Practical Farmers of Iowa, which you've heard of. That group has an excellent website if you want to look at some of the leaders there now. In those days it was really a question of farmers that wanted to do research. They didn't think Iowa State would do their research. And they wouldn't. No money in it. So these guys would do things like direct tillage systems, and they would do pasture grazing and summer grazing, that sort of thing, where you went all season on your milk. There's a lot of different innovative things that are now becoming commonplace. They were a great group of people, all family oriented. They would have wonderful conventions where the guy there that had to get up named Dick Thompson. Dick was a traditional farmer living in Boone not too far from Iowa State, went to Iowa State. He could just see through the propaganda. And so they started this farmer-led research group.

Part of their charter was that they shall not lobby. And it still is. So we couldn't count on them when we needed support in the legislature because they had to stay out of it. That did keep them kind of pure, more or less, they didn't have as many problems with the legislature as we might. Today they're a large organization and they are firmly established. However, when they were just beginning to get formulated they had a lot of trouble with their programs, especially getting it funded. So the Leopold Center funded that. But otherwise we kind of stayed out of it except for community grants. (35:50)

Other not-for-profit groups we funded throughout the system. There was, you had to be tied into Iowa State, though, to get funding. Iowa State or University of Northern Iowa, some of those good schools down there. You couldn't just come into it as a renegade and get funding from us. So you had to have backing of other administrators. They were fun to work with. We really got to know the state that well. We managed to have a meeting in Grenall. Well, that's a staunch conservative university, Grenall College is. Any of the Dutch-led universities down there are really conservative. And they took onto us really well. We got the word spread through those people. And Practical Farmers of Iowa helped us quite a bit there. So that was probably the most important nonprofit group we worked with. The university extension was off and on, depending on the project. They were more Iowa State led, so it was hard for them sometimes to jump in and help. They liked our work on soil erosion and strip cropping, that sort of thing. Strip intercropping is one that's still catching on in Iowa.

But most cases, we had an advisory board, they were broadly based, people from the Soil Conservation Service, people from the extension, a couple people from the department of soil science if we had one. We ended up with 12 or 13 people. They didn't have a vote, they had advisory. So while they could vote, it was only advice, I could do as I wished. You really had to watch your P's and Q's, because it was your own fault if something didn't work. And some things didn't work. We had interdisciplinary teams, I knew we'd have probably 30-50 percent failure. That's about what it worked out. We would bring these guys in, mostly guys but gals too, couldn't get their act together, and the amount of time it took.

So talking here about farming methods. This of course was involved with industry, we couldn't do much about that. But the start of GMOs was Roundup on soybean. And that's the first time Monsanto developed the kind of Roundup-resistance that they don't use anymore because the farmers overdid it. But there was quite a stir when it happened. What's this university going to do about this? They were wondering if GMOs were going to kill the planet, or not. So we had a philosophy that we won't support any work on GMOs for the foreseeable future. Without that statement, I sort of hid under the desk because I knew it was coming, and

when it came we got quite a bit of flack on that one. Eventually we had to kind of give in because soybeans and corn GMO ready are just wild now.

A lot of that technology is failing because they were overdone, we've got the weed resistance is really bad now, there's no way to get over it. Farmers thought they had bad weed problems then, now they've got real problems. They didn't realize that that would happen. Even the Iowa State people said it would happen. But Monsanto, Pioneer—Pioneer was the big force for the good. Pioneer was a very good company. But they were bought out by DuPont, which is something else now, they're gone. A lot of those companies were really good, and they were just subsumed. Now we're down to a big three or four. That's true with animal agriculture, we're down to three or four. And they're all large international groups, especially in the hog industry. Hog industry just had to have its way; it was not going to back off. And they had to be able to spread the manure as they saw fit. And they had to be able to move things through fast in the factory. People would talk against factory farms, but didn't know what they were really talking about. It was obviously new, but you couldn't sit down and define it. But you could define it when you saw it.

Factory farms took away the farming agriculture, especially with things like hogs, that we were used to. The farm I grew up on had hogs, they were pretty profitable. We only had about a dozen. That's all it took, we didn't have a lot of work that way. We had a small dairy, and that was fairly profitable. All of these were gone because of industrial agriculture. So as industrial agriculture crept in, we were fighting a big, big, industrial system, and it just kept stomping on us. They weren't going to let up. So it became pretty soon, the corporate agriculture kind of got out of control of the university. And kind of did its own research in a lot of ways, and development. But the university ended up then hurting itself on both ends. They lost the support of the farmer, and they lost the support of the large industry. They got it back to some extent, large industry was still paying the bill. But it's just like now, we don't have any pilots because we quit training pilots because we weren't going to fight big wars. That's kind of the way it worked there. They quit training the scientists, we did. So because they quit supporting them, things got pretty much corporatized. (42:53)

Speaking about these things, not even being for or against was difficult, because it's hard to comprehend what was happening. China was a big issue when it first started. China was just trying to be sustainable, they didn't know what they were doing. I didn't either; it was too complex. I was over there, did several talks, made a lot of connections. Because I traveled a lot to China and just walked the farms. That's pretty good now, they're getting better at industrial agriculture, but not a sustainable one. (43:39)

I could never define sustainable agriculture in a way that people could understand. That's my fault, probably, but it just still hadn't been defined. Most statements make the same statement I made, it's a work in progress. And we'll never get there probably, but it's a work in progress. As long as technology keeps moving ahead, sustainable agriculture has to keep at it. That definition seems to be the one that is most realistic and I've seen most people adopt. But there's times when somebody would be really frustrated and say, "What is sustainable agriculture?" I said, "Well, I can't really tell you that much." They would look at me and say, "What the hell is that guy doing? Get somebody in there that knows what they're doing!" And there always was a push to have somebody, a non-scientist in there. The person that replaced me was a non-scientist, more of a philosopher.

One thing about the center that we really had to watch out for was to stay away from policy. It was easy to get into policy. I could express my opinion once in a while, but I was



careful not to have the Leopold Center behind it. Straight after it got into policy, probably about five years ago, that was when it shut down. The legislature didn't want to be told what to do. They didn't want the Leopold Center involved in that. So as soon as the chance came, they passed bills that shut it down. It still operates, but it only operates as a ghost, as a small grant from a—well, I think it's a pretty good grant, but the point is they have to go to the Leopold Center. So that keeps it in existence. But strangely enough right now they are looking for a new director. The one who was in there retired. They said he was not effective, but how can he be effective? He only has his own nameplate on the door, a tiny budget, no real expertise in the field, he didn't have any, he was a good animal scientist, but not a Leopold Center kind of guy. (46:17)

Leopold was an ideal name for the center. A lot of people said, "Why Leopold?" But when you look at how comprehensive our programs were, you can see that Leopold Center was very well done. They wanted to name it the Rachel Carson Center for the legislature just to kill it. But that didn't work. But that was Paul Johnson. He's the one that really put this together and all of that. Paul got some other legislators, Democrats in the House, and then he got one Republican. And they put together a bill and got it through the legislature by hook and by crook. I've heard those guys in some of the discussions we've had over beers talk about how the legislature was pushed by people doing the right thing at the right time to get it passed. That was what it took. You'll never see that kind of cooperation again in Iowa. It's now a red state and will likely look like Kansas more and more. Which is one reason why I'm glad I'm not there anymore. I couldn't take that. (47:49)

Social, political, and religious agricultural movements. Well, we have—I don't think we've got religion too much, except surprisingly the Catholic church was against me. And I finally got to know the guy, the father in Dubuque who was so mad—he was mad at Iowa State, he didn't care where it was coming from—he and I got to know each other real well, and had some pretty good sessions together, and that kind of settled that down. That's kind of what it took. Otherwise they're sort of neutral about religion; I didn't really get involved. Thank goodness; that would have bothered me a lot.

It's hard to say whether I got very involved with organic organizations. I didn't think I did. They would kind of regard me as a heretic in a way. I wouldn't preach organic. In fact, we wouldn't really fund purely organic work because we knew that wasn't what Iowa wanted. Wasn't what they needed. When you're trying to grow thousands of acres of soybeans, you don't worry about whether they're organic or not, you just grow them. Iowa did have and still does have an excellent organic scientist, soil scientist, Kathleen Delate. Kathleen still does excellent work in that area. But she's never been allowed to really expand her program the way she'd like to. Iowa says there's no market, but that's wrong. There's tremendous market. But the organic we're seeing now on the stores is probably not too much organic.

My granddaughter, they've given up on organic because they can't find feed that's organic. You don't feed your cattle and hogs on grass fed all the way. You have to have some corn. And the corn you buy that's labeled organic comes from Argentina. Well, you know that's not organic, that's just fluking the shipping laws with that. I just saw in a paper today that Vilsack is going to try to change the rules back on organic definition for chickens. Perdue managed to change it so they didn't have to be pastured or anything, they could just stay in their little confined and still be organic, which was not in the first definition of organic. So he changed all that. He did a lot of stuff like that. If we can keep Biden along long enough to get that done. So the USDA had a nice organic committee. I was on an organic committee here for a while and

in Iowa. But trying to define the rules was tough. The three-year rule to wait was tough. But it seems like the public is very well into grass fed, you can call it natural, which it is, but it doesn't have to be called organic. Some of the marketing schemes are probably not as good as they used to be. (51:41)

I can't say enough about Practical Farmers of Iowa, and I hope you get a chance to talk to someone there. Dick Thompson, who started it, he was in his mid-50s when he finally got going. Converted his farm pretty much to non-pesticide. He never went organic and crop rotations, that sort of thing. He was dreaded by his neighbors, they really made fun of him. Said the reason he has soybeans is that he goes out and cuts all night when nobody's looking, that sort of thing. But Dick was a good leader and called a lot of people together, his wife, and got this organization going. They're now completely farmer-led still, they go apply for grants and get some from the Leopold Center, used to. I think they were very powerful because they're so farmer-oriented and they just don't use outside help that much. Farmers work with the university on sound research designs, set them up in the field, talk them over a lot in the winter to define their programs and define their experiments, and go out there and do them. They're very family-oriented, which bothered a lot of people at Iowa State. You'd be surprised how much it bothered them to have women in there nursing babies. Isn't that crazy? We thought it was great. But it cost us sometimes in PR.

So I've said quite a bit about not getting on necessarily with Iowa State. And that's true. The legislators were controlling, they were being controlled by the commodity groups. And then the legislature would set the budgets, and Iowa State was beholden to them. And they had to kowtow to that to keep going. I've always been critical of the expense and that, education cost, because that meant they all got tied into industry. Once you get on the treadmill you can't get off of it. Which they're on now. But I don't see much change there. I think the new dean at Iowa State is pretty good, he had quite a bit of experience here. And that was Leopold, was the work. (54:45)

I started out with the Leopold Center being such a good name. It was partly because Leopold had a bigger view of the environment than most people do. There are others that have had that, Rodale had that, but that's what it takes to be able to sit there and look at the broad scale, see what A and B and C are doing to each other. That's what the center tried to do. Leopold was good at that, he was also a tremendous philosophy. So we could keep his *Sand County Almanac* every day. When we looked through our programs and grants at those meetings, we'd always have something up on the blackboard, "What would Leopold do?" Actually, "What would Aldo do?" And that was a good tip. I knew the Leopold family well. We actually did research while I was here on the farm, on the ranch we call it up there. I had known Nina quite well. Of course I never met Aldo. I almost met his brother, but I didn't quite; he died just before I got to see him. But they lived in Burlington, which is just as hilly as here in Wisconsin. But his background was very similar to a lot of academics. And he had the same disdain of academics as a lot of people do, that they have a centralized view of life. Got some beautiful chapters in there about how agriculture has been, how scientists have taken years taking something apart and have no idea what they did, but they got it all apart. That's kind of what we did in soils. We took things apart and never bothered to see what they did if you put them back together. (56:50)

How the relationship with land grants changed over time. I think it's gotten worse. That's not good. They've changed, institutions trying to do things like what we were doing, and modified their programs to keep alive. Agricultural institutions, land grants have not really done very well. An interesting program, when sustainable agriculture was being defined, at least

accepted as a name, the USDA had a thing called LISA, low input sustainable agriculture. Industry loved to take off on that, having this little lady named Lisa out there farming. But they got some money to survey all the universities, land grants, and the USDA too, the ARS, what programs did they have that really were sustainable, what research programs? They kept redefining sustainable so they got more in. But essentially none. Very few. And that people can't understand, why working on a piece doesn't mean you're working on the whole.

Building the organic matter of soil is so important. That's sustainable to me. Sustainable agriculture to me is having enough money to keep going every year, which is part of the problem, having the people stay on the land so they don't go out working at Wal-Mart. And that's a big part of the problem. And of course leaving a land and water legacy that's better than it was when you came in. That was the hard part of the Leopold Center, in a way, it was sitting in this land grant that couldn't really look at all three. Sociologists knew they wanted the people around. They didn't really know how they kept on, except cry about it. Economists knew you could make money in agriculture, but they didn't really know how you could do that and be organic. And farming of course kept going up and down, maybe worth a lot of money and then not much. Right now it's way too overpriced, with land and the commodities. That'll change. (59:29)

I had a, my wife had a family in southern Iowa, they were actually cousins and all that sort of thing, we'd go down there for a reunion every once in a while. They were staunch Republicans and staunch in their agriculture, they were sustainable ag. It was interesting when I went down to family reunion and visited them, they cut away at me. I learned a lot that way. I'll never regret those experiences. You really have to live in Iowa to understand Iowa. You can't understand it from up here. I do now because I was there. I guess in that way I'm glad that I took the job, got a broader experience in life. It's funny, I grew up on a farm, and that sort of thing, but I didn't appreciate all this stuff. It wasn't that complex when I was there. (1:00:39)

I was involved with this ethanol thing as it began to develop. Of course on the wrong side of the fence from them. And you could just see what they were doing. It worked out, they got more corn than ever, more production that was environmentally unsustainable. It didn't help anybody really, they just had some money in agriculture, but it would have been just as cheap to have shoveled the money in without the ethanol. That's essentially what they do with a lot of these programs. The ARS, the USDA has a lot of programs that are just getting money out to the farmers. That's how Perdue tried to keep the votes for Trump. And it largely succeeded. Farmers were doing well, so why should they change their vote? They always voted Republican anyway, so this was working out better. Trying to influence those people to get ecologically sustainable was tough. You could tell them, "You're using too much fertilizer," and they sort of understood that. But then they asked, "How much is enough?" So they used less, but then they run into problems with yield. It's a guarantee that you're buying, and it's probably over-insured.

Soybeans are the other crop that's down there. And it's different obviously in the way that it's grown. Turns out the corn-soybean rotation, which isn't really a rotation because they're too close together and too intertwined, that combination produces a lot of nitrate. And it's made a lot worse because of having to dispose of that manure. They've done quite a bit of, Minnesota did quite a bit of good work looking at the profile of nitrate as it, as the corn was growing, and soybean, and tile drained and un-tile drained. Pretty well showed that the whole thing was dumping nitrate into the groundwater. Minnesota's got a lot of nitrate problems. As much as Iowa. I don't hear about it here, but I wonder if it's not here. It almost has to be. Nitrate issue is a major one. It's more harmful than you might think, to rural people. In Iowa they got around a lot

of things by just getting rural water supplies where they could hook into, get groundwater that was not contaminated. That kind of took the burden away, why should I care? That made it worse for farmers to try to do something good. (1:03:58)

Past and current trends. I don't see much in the way of current trends right now. We keep doing what we were doing. Might be at the micro level there's a little more cooperation. But the way they ripped out the Leopold Center, there's always a lot of negative out there. And there was no way to stop that. It just seemed to happen. That's why I say, there's a group of people that were the last people who were in the center that they still have a chat group. And they're not seeing much change either in what's going on. I think the best thing that agriculture can do is just to squash on sustainable agriculture and make it a past word, a historical word. I hope your thesis will help make that more of a word for today.

But you look at all these things, those are economic and environmental. Environmental is most important because you can't farm without good soils. You can't hold and slow the nitrate down and that sort of thing without good soils. So in a lot of ways sustainable agriculture should have been a soil science problem. So I was the right person at the time. They've tried to put sociologists in there, and other people in there, but we still are what they want. I've seen that science advance tremendously.

So you want to hear about organic certification. I've sort of given you a thumbs eye view of that, it looks like it's already hard. They really had a good thing going for a while under Clinton and under, I don't think even Bush did much to it. But then Trump just tore it apart. That's what's going to happen every time a regime comes in, it's going to change things. That's hard to adjust to. I feel sorry for the organic people that are trying to keep it going. But they will. And there's a lot of reasons to be organic. A lot of good reasons. It's just not fitting into the industrial ag model. It probably never will. They are planting 400-600 acres a day. Huge machines, fourteen rows. They don't even have rows anymore, they plant them so close together. You don't need to cultivate, you just spray. The continuous spraying of course does a number on the weeds. Bugs also become harder to control. And things like the monarch gets killed in the process. (1:07:58)

So what did you want me to talk about right now?

**AA:** Well, it was really interesting you talking about organic matter and how that wasn't really discussed much at all when you were studying soil science. Was that in the '60s or the '70s? Because I found that interesting, because I was doing a lot of research on New Deal soil conservation, and how they were talking a lot about organic matter then, and then in the '50s sometime that was when soil science really stopped doing anything with soil biology, it seemed like, for a couple decades.

**DK:** I think you're right, that's a good observation.

**AA:** So I was just curious if you had any insights, of course that was before you were involved in it, but any ideas?

**DK:** Downstairs I've got the Yearbooks of Agriculture for periods in there, and you'll see a change away. I don't know whether agriculture got scared of biological farming, if that sort of scared them off, but it became very passe to talk about organic matter as part of soil. They didn't put it as a separate part, they tied it in with clay and all that sort of thing, but it didn't add up,

they wouldn't integrate. They just didn't think about it. So I think you're right there. It took a while for society to catch back up again.

**AA:** Yeah. And I'm also, if there's anything else you want to share, I thought it was really interesting how you were talking about how scientists couldn't do research like that, couldn't get funding, and then the credibility thing that you couldn't get tenure, if that was the kind of research you wanted to do. I find that really fascinating and was wondering if you had any other insights on maybe why that was and how many people maybe there were like you that might have done more research on that if you knew you could have.

**DK:** I know quite a few people that they struggled to do what they wanted to do. There was a scientist at Iowa State called Liebhart. He's developed a lot of really good farming methods, strip intercropping and that sort of thing, and they're not used. I'm sure he gets pressure all the time to do something realistic. If industry doesn't want it, it's not going to go. It might be the best way to answer that. But the leadership in the college is against it, you've got the deans trying to stay alive, and the faculty trying to be independent, and the students wondering what the heck's going on. Then we've got the pressure groups coming on and pushing it. Those four groups don't really organize, it's just every day. The president of the university at Iowa State is a former dean. She was an entomologist who I knew pretty well, came up through the ranks. She probably sees things more than a lot of them, but maybe she's not strong enough to do much about it. Then we would propose research, she was sitting on the Leopold Center board, we'd propose research that didn't really have anything much to do with corn, and she would say, "Why don't you do more research with corn? That's what the farmers want." We said, "That's what Pioneer's doing. Why should we do it?" So I could see where the corn group was just pushing.

But your observation that organic matter began to come back in is a good one. I think Paul Johnson, who was head of NRCS, was a type of person that they had that was leading. It would depend a bit sometimes, but USDA didn't have a very strong leadership. In a kind of way, USDA, those days it controlled the flow of the money. They don't do it anywhere as much now. But then the funding from the federal government for research is pretty minute anyway. That's a good trend there. Scientists by themselves are not out to rule the world, or out to destroy the environment or anything like that. They're doing their best. But they just, their hands are tied, some of them. And you can't run a research program without money, and you've got to do what gets funded. So that's a sad part of the way it works, but that's true. New Zealand, when I went down there, had a beautiful system which was federally funded, but was hands-off; the feds didn't have anything to do with it. So they could do what they wanted. When I left they were, after I left they really dismantled that and made it industry responsive. They changed that research system a lot. It was a good system. It isn't as much now. That is true elsewhere. But I think organic matter as a word has been alliterated to the conversation really well. (1:14:19)

So what direction do you want me to go with this? I'm fine to have a question.

**AA:** Well, if you want, I'm curious about when sustainable agriculture, any insights you might have on when that phrase was starting to become popular and why they settled on sustainable instead of like alternative or low input or some of these other words that they were throwing out at the same time?

**DK:** Well, those other names have been out there, and sometimes they're still used. Especially alternative. But you had to ask that question, alternative to what? So it was hard to define that. You could say alternative to the bad part, but sustainable made more sense. Sustainable came, the word itself was new, unused until the UN made a nice big report on sustaining the environment. And then people began to think about what to name, and the UN sort of, it made a huge difference in those days as to where the science was going. But a lot of people, I still struggle with it. It was not a popular word to a lot of places. The LISA thing was easier to understand, but it was easier to make fun of, too. And that didn't last that long. It's what's in a name, in a way. You've got to call it something, I guess. A lot of people think the Leopold Center might have lasted if we hadn't had "sustainable agriculture" in the title. I don't know what else we would have called it. Like you say, it's hard to find the alternative words.

**AA:** Yeah, it's interesting, in the 1940s they were using this word called "permanent agriculture," but that seems to have fallen out of favor, like I don't see that after about 1950.

**DK:** No, I don't see it at all then. The group that was pushing that was in the organic gardening era. Soil scientists in large regarded them as crackpots. They didn't catch on. They knew what they were doing, but they would go back and tear apart their work. It was good work. But it just didn't catch favor. So I think we settled on sustainable as the word that is most accepted. Not completely. But it was a buzzword in the '80s as well. And in the early '90s conferences all over the world, papers, and books, and whatever. And a lot of them didn't really look at sustainable, they looked at some facet, but they weren't looking at the big picture. Even that was hard. How do you get a university group that's very discipline-oriented to do research on the big picture? Make them think that way? (1:17:49)

**AA:** Do you have any insights on the rise of interdisciplinary, or they call it multidisciplinary sometimes, research, as related to the Leopold Institute, or just in the universities in general? Because it seems to be around that same time that that was really coming into existence as an idea.

**DK:** I would say not much chance for them to advance. That's a hard concept to get tenure on. And I think that's the killer. It's hard to fund interdisciplinary groups. They'll go for a while and had a leader that was really enthusiastic. Then that person went on to another job or whatever, and the group kind of fell apart. So it's hard to get the kind of dedication to do interdisciplinary work. And how do you justify through college a paper that has 20 names on it? Which is what it should have; you see those ones in *Science* that have 20 or 30 names on them. That's truly interdisciplinary. We don't teach it that way. I think, I was in the Institute for Environmental Studies, and on the faculty there for several years before I left, I thought they were trying to do a pretty good job, put it together. And once I left I sort of lost touch with it. But groups like that are what it takes. Colleges with their departments, departments with their little fiefdoms, are not the way to do interdisciplinary research. Look how Bell Laboratories got things going with electronics. That was interdisciplinary. They put a bunch of scientists together and made them work. You can't do that here, that doesn't work in academics.

But the soil science department, when I was there, was fairly interdisciplinary. It did get a lot of people together to do at least some brainstorming on it. We had some tremendous scientists

in those days, we were world-renowned. It was a great place. So my hopes for a truly interdisciplinary world are not very great. I think that's just the way it's going to be. (1:20:44)

I just want to say, I'm glad I did what I did, glad I got into this area early, because it was fun to be a pioneer. I think I changed quite a bit of our university work, especially our society work. So I'm glad you're trying to pull something together; it's really needed. Just know there's a lot of ugliness out there in this sort of thing.

**AA:** Yeah, I'm realizing that.

**DK:** I don't know how you put all that in one spot without being negative. That's one reason I haven't written much about that detail.

**AA:** Part of the reason I'm interested in learning about it, it's not to like air everybody's dirty laundry or something like that, it's more to help as we go ahead now into the future to learn from both the successes and the failures and mistakes that have been made so we don't repeat all the same mistakes and maybe do, maybe can work together a little better. I don't know if it's possible or not, but maybe.

**DK:** That's important. Hard to get people to think about history. They just like to do it their way, and that's the way it goes. We made a lot of mistakes when we were starting the center, just not knowing how to define it and how to set up a research program. And it took a while to hire the right people. Sometimes a hire just didn't fit, and they had to go on, move on, and we had to look for the next one. I got a person second-in-command, Gerri Neil, who was fabulous. She did exactly what I agreed on, because we both had the same views. And she did a very good, she was a better gauger of people than I was, if anything. And she wasn't interested in climbing the ladder any further, so we worked together very well. I don't know, I'm not familiar enough with the university now to know how a center like the Leopold Center would integrate into today's world. It's probably tough. But I don't know what I'd do if I started over. It'd be really hard to think of what you're going to do. Takes a lot of energy. And then it's easy to end up being one person, and when the buck falls, it falls right in your lap.

I don't know, I think, somehow I've got the ability though to think it through and get the bigger picture all the time. The problem was trying to explain to other people what that was. And I got frustrated with myself because I just wasn't coming up with the right words at the right time. It was a great life in a lot of ways because I got to go around the world plenty of times and spend time in countries I wouldn't have otherwise, open scientific doors I wouldn't have been in otherwise. You just can't beat that. So I think I was one of the lucky ones. I guess the perspective though, I don't think we got as much done as I hoped we'd do. But 20 years is not much time, that's what I spent at it in Iowa. I was trying to compare the time it took, a century to get there, and if it works, nobody will want to change everything in 20 years. I wish we had more support from the universities, especially from the legislature. Iowa State you can't do, at Iowa you can't do anything because the courts will stop you. They've managed to write the laws very cleverly so that you can't get into where you should be. This policy, it's tough work, I know that. I guess that's about it. I don't know.

**AA:** Yeah, I think so, you've covered it pretty well, unless there's any like advice you'd like to give, if someone is listening to this recording in, say, 50 years, what you'd want them to know about your work.

**DK:** The book is about the years I was working and stuff and how I started on the farm and grew up. It goes through the college years and then goes through the Wisconsin years and through Iowa State. And when I retired, that's the last page of the book. I'm thinking about still trying to put together something like what this webinar is you're going to see, a more realistic, more open. I want to give people an idea of what it was like and why it didn't work in the end. Whether we should have something as well-controlled by the legislature as that, that's probably wrong. It did help at the time. Environmental studies was shaky for quite a while because they were tied up to the legislature. I think somehow they got it more stabilized. I really liked that group always had. Is your degree in, what's it really in?

**AA:** In plant science, and in soil science. Thank you. I really appreciate you taking the time to interview.

**DK:** No problem.