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Abstract:

Roy Harrington was born on a farm near Atlanta, Missouri on October 23, 1925. The family raised cattle, horses, sheep, hogs and chickens, but their main source of income was from registered Hereford Cattle, which were sold for breeding stock. Education was valued in Roy's family. Both of his parents attended the University of Missouri at Columbia, and Roy followed in their footsteps, studying Agricultural Engineering. Drafted into the Army in 1944, Roy attended school for a new technology called Recoilless Rifles. His job while he was enlisted was to train others how to use this rifle. After WWII, the GI Bill paid for Roy's education. In 1950, immediately after finishing college, Roy went to work for John Deere. Farm tractor sales were at a peak, and companies were willing to invent in Engineers to develop new equipment. Some of the projects Roy worked on include: hay balers, tractor seat suspension

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Interview with Roy Harrington

ISM_12_HarringtonRoy

October 1, 2008

Interviewer: Mike Maniscalco

Maniscalco: Okay, today is October 1, 2008. We're sitting here at the John Deere Collectors Center with Roy Harrington. How are you doing, Roy?

Harrington: Good.

Maniscalco: Great. Well, it's great to be here with you, and thank you for coming over here and doing this interview with us. It's very nice of you to be here. We're going to ask you some of the very easy questions first, so why don't we start off with your age and date of birth?

Harrington: Okay. The age is 82. October 23, 1925.

Maniscalco: Okay. Where were you born?

Harrington: On a farm near Atlanta, Missouri.

Maniscalco: Oh, okay. Now, did you kind of have your parents around you and all that kind of stuff at that time? Was it your whole family—extended family—or...?

Harrington: Well, I have two parents and two older sisters, two older brothers.

Maniscalco: Okay. How about grandparents, aunts, and uncles?

Harrington: Well, none of them lived closer than fifty miles from us.

Maniscalco: Now, you said you were born on a farm.

Harrington: Right.

Maniscalco: What type of farm was it?

Harrington: It was a general farm, but our income was made off of registered Hereford cattle. We sold them for breeding stock.

Maniscalco: Okay, so it was a cattle farm, basically.

Harrington: Well, not—

Maniscalco: Cattle farming, but—

Harrington: Well, in those days, we had cattle, we had horses, we had sheep, we had hogs, we had chickens.

Maniscalco: Were a lot of those things being raised to just feed the family?

Harrington: The hogs would be that. The horses, of course, they were draft animals, plus we had two that were saddle horses—partly used for the cattle and partly used for my older brother and sister to ride to high school. And chickens—we sold eggs, and we ate chickens. (laughter) The hogs, well, some—some say—we didn't have a lot of hogs. Sheep, you sell the wool and sell for meat, too.

Maniscalco: How big a size herd did you have?

Harrington: We had about fifty cows.

Maniscalco: Oh, really? And then what about like the sheep?

Harrington: Twenty-five.

Maniscalco: Oh, okay. Do remember what type of sheep—what breed of sheep they were?

Harrington: They were not purebred, unlike the cattle. They were probably Shropshire.

Maniscalco: Now, you mentioned that you had draft horses, and I imagine those horses were being used for working on the farm.

Harrington: Right.

Maniscalco: Can you kind of explain what that was like?

Harrington: Well, you have to do all the farm operations. If you're growing cattle, you have to grow a lot of hay, so we did a lot of haying. You have to mow, you have to rake, you have to put the hay in the barn or stack some outside. Horses are used for all that. Horses were used to plow, and then disk and harrow and plant, pick corn.

Maniscalco: Now, I would imagine you had to do some of this work.

Harrington: Yeah. Well, sure. (laughter)

Maniscalco: What was the favorite part about doing all this?

Harrington: (laughter) Well, let me restate the question. (laughter) The first thing, field operation I did with horses was walk behind a spike-toothed harrow. My father said, "That'll improve your character." (laughter) But it's discipline. What I found out, it improved my memory, because you're supposed to rest the horses periodically during the day, and you know, young boys sort of forget things like that. But when you're walking behind the harrow in soft ground, then you're able to remember that somebody's getting tired. (laughter) And so you rest the horses. (laughter) But if it had been something like a mower, where you're just riding along, no need to rest the horses.

Maniscalco: (laughter) So, when you were growing up on the farm as a young boy, your father put you to work doing this job, probably numerous other jobs as well.

Harrington: Sure.

Maniscalco: What were the jobs that you were saying, "Gosh, this is great; I love doing this one," compared to some of the others. I'm sure you had to have favorites over other ones.

Harrington: Young boys don't—they're a little allergic to work. (laughter) But... Well, eventually we got a tractor, and I really enjoyed tractor driving. But the rest of it, I wasn't that enthusiastic. But I still worked hard.

Maniscalco: Now, as a child on a farm, you probably went to a rural school.

Harrington: Oh, yeah.

Maniscalco: Can you describe what your school was like?

Harrington: It was three-quarters of a mile away. We went through our farm, across the creek. And I was in a class of five students, which was the biggest class. Theoretically, they teach all eight grades, but it's a little more complicated than that, because one year, they'll teach sixth and eighth

grade, and another year, they'll teach fifth and seventh. So they're really teaching six grades at a time. And you're all in one big room. This school was a little better than the average. It wasn't exactly a one-room schoolhouse. We had that room, and we had a cloakroom, and a library, a stage, and we had a full basement. But it was a pretty typical rural school.

Maniscalco: Now, do you have any memories of what it was like going to school there? What was the normal day like?

Harrington: Well, I liked school. And like all kids, I liked recess. And (laughter) one of the interesting things was, the first teacher I had for the first four years really loved kids. She was very strict, but she loved kids. And so it was well-known that one day a year, we could throw snowballs at her. (laughter) But what we didn't realize was she would always pick the coldest day of the year, and you can't make a good snowball (laughter) when the snow's too cold. You need it where you can pack it. So she didn't get roughed up too much. (laughter) But that was the type of person she was. She had some flexibility, but she kept order.

Maniscalco: Well, that's good. I mean, you're talking about order and how strict she was. Can you tell us, what was the discipline like in schools at those times?

Harrington: There wasn't much problem, because people knew better than to cause trouble. There wasn't—well, even today, you go to one class, and there's no mention of discipline and no need to mention it; another class, there's a lot of misbehavior. Depends on the teacher.

Maniscalco: Oh, so you would attribute that to the teacher, basically?

Harrington: Absolutely.

Maniscalco: And what was it that she brought—I mean, you said she had discipline and she was strict, but what was it exactly that she was doing to impart that on the class?

Harrington: Well, I don't know. One of the things they do nowadays with little kids—first-, second-graders—they don't have them stick to one subject too long. You work on our alphabet for a little while, and then we switch over to something else, and we switch over...so that they don't get restless from doing the same thing all the time.

Maniscalco: And did your teacher do that same sort of thing, do you remember, or...?

Harrington: Well, it's different, because within a given quarter of a day, she had to teach six different grades. So she spent some time on first grade, second grade, third grade, and fourth grade... So.

Maniscalco: So I guess you kind of had to do some of your learning on your own, then.

Harrington: Right, right. And there was probably more independence then than there is now.

Maniscalco: Interesting. Huh. Now, you also mentioned recess. What sorts of things did you do at recess other than throw snowballs at your teacher once a year? (laughter)

Harrington: Well, this was in a wooded area, and the boys dug out a hole that would collect water, and we could put little boats in it. We had hickory trees that were rather thick, and so they grew tall and skinny, and you could climb those, and just before you got to the top, they'd come over and come down to the ground with you. Those were two of the things I liked. And then we had regular games and dare base and ball—ball games—and we had a teeter-totter and a slide and a swing.

Maniscalco: Wow. So it sounds like you had quite a bit of things to do during recesses.

Harrington: Oh, yes.

Maniscalco: Now, what about the other kids? I mean, do you have any memories of some of the other kids from then?

Harrington: Oh, sure. Sure. On weekends, three or four of we boys would get on our bikes and go to the other guy's house, and another guy's house, and just ride around on bicycles.

Maniscalco: So was it a common thing for all the kids to have bicycles then, or...?

Harrington: Most kids had access to a bicycle. My brother and I bought ours.

Maniscalco: Do you remember buying your bicycle with your brother?

Harrington: Yeah.

Maniscalco: What was that—

Harrington: It cost $20.

Maniscalco: It cost $20. Do you remember what kind it was?

Harrington: No, I don't.

Maniscalco: Do you remember what it looked like?

Harrington: It was blue.

Maniscalco: It was blue? (laughter) That helps. Did you have a choice in the color, or was it...?

Harrington: I suppose. Blue has always been my favorite color.

Maniscalco: Well, then you got it. (laughter) Do you remember what that was like, though? Did you have to go to a store, or how was it...?

Harrington: No, I don't remember that. But in those days, they were all single-speed bikes and coaster brakes.

Maniscalco: Hm. Now, kind of getting back to the friends and the farm, when you did have friends over to your farm, what sorts of things were you doing?

Harrington: Oh, I guess just playing.

Maniscalco: Did you have any special games that you liked to play, or...?

Harrington: Well, within our family, at least, we'd play croquet. I can't remember too much.

Maniscalco: Well, croquet's good. Did you have like—were you playing croquet at like family gatherings, or was it...?

Harrington: Well, just our family.

Maniscalco: Oh, really? Huh.

Harrington: Well, if you—

Maniscalco: So it would be—

Harrington: —if you have five children—

Maniscalco: Well, I guess that's quite the game, then.

Harrington: —and then two parents, that's more than you got in a croquet set.

Maniscalco: So that's pretty cool. So was it like a normal thing to go out and play croquet with everybody?

Harrington: Well, it was something we did at times.

Maniscalco: Interesting.

Harrington: We always had a good swing. Rope hung from a high limb in a tree.

Maniscalco: That must have been good. Now, you mentioned you have brothers and sisters.

Harrington: Right.

Maniscalco: Getting back to the idea of work, was there certain work that the boys were supposed to do and that the girls were supposed to do, or...?

Harrington: Right. But the younger of my two sisters was part boy, and she also would drive the sulky rake and do some slight amount of field work. She loved riding horses, and she went through high school and always riding a horse five miles to high school. So she liked horses and was a very good rider—much better than I was. Because when I came along to high school, I walked two miles and then took a school bus.

Maniscalco: Oh, really? So there was a school bus to where you could pick it up to go to high school. Where were you going to high school, then?

Harrington: Atlanta.

Maniscalco: Oh, so it was kind of like a consolidated high school, then, with a lot of kids from the area, or...?

Harrington: Well, it was a large area, but it wasn't consolidated, I wouldn't say. I only went there for high school; I didn't go there for grade school.

Maniscalco: Yeah, yeah. So what was it like going to high school, then? I guess it was a bit bigger than the grade school.

Harrington: Yeah, I graduated—I started in a class of about fifty, and there were twenty-seven graduated. Some of them had already gone off to war.

Maniscalco: Oh, and that would be World War II?

Harrington: Yeah.

Maniscalco: Interesting. Well, what was it—I mean, when the kids were going off to war like that and not graduating high school, what was the thought? I mean, were people proud of them, or...?

Harrington: Well, probably. They were more likely not the top students, but it was something to do.

Maniscalco: Do you have memories of any specific friends that went off and didn't end up graduating high school with you?

Harrington: No. I can remember specific friends that went off and died in the war, but...

Maniscalco: Oh.

Harrington: After school.

Maniscalco: Now, you know, a lot of the kids your age were going off to World War II. Why did you stay?

Harrington: Oh, well, I was drafted—I got out of school in ’43, and I was drafted in ’44. I was still eighteen when I was drafted.

Maniscalco: So were you drafted into the Army, Navy...?

Harrington: Army.

Maniscalco: Army? And where were you deployed to?

Harrington: Well, I never—the only place I left the U.S. was to go to Mexico. I got into a special schooling on the recoilless rifles, and I taught others how to use them. And we went to Mexico and demonstrated them down there.

Maniscalco: Interesting. So recoilless rifles—how did you end up doing that? I mean, you know, there’s a big war going on, they could just be funneling people off? How did you end up...?

Harrington: Yeah, but they are always looking for new technology, and while it was real clever, it wasn’t real practical. A person could carry a 57 mm recoilless rifle—a single person. I mean, that’s about that big a shell. And four people would carry the 75 mm. Now, what’s wrong with them is whenever it’s fired, the shell is going out the front, and there’s a big blast going out the rear, and especially at night, you can see that for miles. And therefore, the enemy can see where you are and shoot at that location. So it was a good idea that didn’t quite work. (laughter)

Maniscalco: Well, I’m sure there’s lots of those out there.

Harrington: Which is true of new ideas.

Maniscalco: Now, through your work with the military and doing that, were you trying to somehow figure out ways to make it work better, or were you just training people on it?

Harrington: No. Well, I guess I ended up a sergeant. But no, that wasn’t our responsibility.

Maniscalco: So you more or less were training people—

Harrington: Right.

Maniscalco: —to use this weapon? Okay.

Harrington: Right.

Maniscalco: Now, I’m sure, being within the States and in the military, you got some time off to go home every once and a while, back to your farm.

Harrington: I suppose twice, maybe.

Maniscalco: Do you remember what it was like going back?

Harrington: Yeah. One time, I took a soldier with me who lived much farther away and wouldn’t have time to get home. And we went rabbit hunting because with all the boys off in the war, there was a big boom in the rabbit population, and you could stand in one place and shoot rabbits in three different directions.

Maniscalco: (laughter) So that must have been fun.

Harrington: Yeah.

Maniscalco: Well, good.

Harrington: Well, I’m not a hunter, but that was fun that time.

Maniscalco: (laughter) What was it like when you came back home? Were their any changes? How was your family handling the war and you being gone?

Harrington: Well, this gets a lot more complicated, because I had a sister—my oldest sister was a missionary in the Philippines, and she was in a concentration camp during the war. So what happened to me was not much interest relative to... We didn't hear from her for thirty months.

Maniscalco: Oh my gosh. Was your family aware that she was in a concentration camp, or

Harrington: Yeah.

Maniscalco: —they just didn't know where they were.

Harrington: Yeah. But they didn't know if she was alive or dead.

Maniscalco: Did she make it through that?

Harrington: Yeah. Yeah, she lived to be ninety-two, I guess—ninety-one.

Maniscalco: My gosh. My gosh. So when she came home, it was probably a pretty big deal.

Harrington: Yeah.

Maniscalco: Wow. I'm sure when you came back, too, it was a pretty big deal.

Harrington: I suppose.

Maniscalco: (laughter) Do you remember—now, being on a farm, farmers had—there were some different things that they could abide by during the World War II times—you know, gas rationing and different things like that. Do you remember any of those sorts of things going on on the farm, or do you remember hearing about them?

Harrington: Well, I remember restrictions on the speed you could drive and the ability to get good tires, and sugar ration.

Maniscalco: Was your family able to do okay through those times—

Harrington: Sure.

Maniscalco: —because of the farm?

Harrington: Sure. Farm folks are generally pretty self-sufficient and flexible.

Maniscalco: Well, that's good. Well, now, you went through high school, and at some point, did you get a college degree?

Harrington: I have a BS degree in agricultural engineering. And both of my parents are college graduates from the same University of Missouri, Columbia. My father has a BS in agriculture with a minor in veterinary medicine, and my mom had a two-year degree in home economics.

Maniscalco: Wow.

Harrington: In their case, they had to leave home to go to high school. So they went to high school in the same town, Columbia, that they went to college.

Maniscalco: So was it just like a natural thing that you were going to go to college?

Harrington: Yes. Yes, because—well, it was just understood. All the children were going to go to college. Because my parents were college graduates. Actually, my father's father went to college—

Maniscalco: Really?

Harrington: —and my mother's mother got a degree in double-entry bookkeeping. Now, I would guess that might be a year's schooling. I don't know how long it is. But...

Maniscalco: It's an advanced degree, though. (laughter)

Harrington: So the family was pretty education-oriented.

Maniscalco: Wow. Can you point to any reasons why that would be? Is there...

Harrington: I don't know. My father's father was a teacher and a country judge and a farmer, and...

Maniscalco: Do you know where they came from, in terms of...?

Harrington: (laughter) Now, that's an embarrassing question, because my father knew his grandfather, but the grandfather would never tell anyone where he came from. What we know is he came from New York to Ohio as an apprentice—and I can't tell you apprentice to what—when he was twelve years old. My supposition, considering the time that was involved, was that he was probably from Ireland, from the potato famine, and he might have owed money on his passage that he didn't complete. But that's—who knows. What we know is that he would not tell his children or his grandchildren his background.

Maniscalco: Oh my gosh. But you do know that he came from Ireland at one point or another?

Harrington: No.

Maniscalco: Oh, not even that.

Harrington: We don't know that.

Maniscalco: (laughter) Wow.

Harrington: We know he came from New York to Ohio.

Maniscalco: (laughter) Wow. That's interesting. So do you remember your parents—when you were growing up as a kid, do you remember them saying, "You're going to college" or "Because of this" or anything like that?

Harrington: No, it was just understood. If your parents went to college, why wouldn't you?

Maniscalco: That's interesting. So can you tell me a little bit about getting your degree and going to college, and what that was like?

Harrington: Well, I guess I hadn't heard too much about engineering... Someway or another, during the time I was in the Army, I learned more about it, so I could say that's what I wanted to take. And agricultural engineering was available at the University of Missouri. It's very similar to mechanical engineering with courses thrown in like agronomy and ag economics that vary up from mechanical engineering. But I thoroughly enjoyed it, and.... Expenses for college were a little bit different in those days. My parents gave each of my brothers and sisters $1,000 to go to college, which was good enough for four years.

Maniscalco: Oh, my gosh. (laughter)

Harrington: But we didn't have a dormitory room filled with stuff like you do today. In my case, the GI Bill pretty well footed the bill, so my parents didn't give me the $1,000 until I graduated. (laughter)

Maniscalco: That's not bad. So what was it like? I mean, if you didn't have these big, fancy dorm rooms like they have now, where did you stay?

Harrington: Well, I started off in a men's gym. There must have been 200 people in there, because all this influx of soldiers, they put up some military buildings. And a little after that, I got into a room that was designed for two but had four beds in there. But fortunately, we only had three, and one of the guys dropped out before too long, so we ended up with two. The other kid was Navy, and quite different personality from me. He wasn't a very serious student, but we got along great. So he and I were roommates probably three years of the four, even though we were completely different personality.

Maniscalco: And he was in the Navy, and you were in the Army.

Harrington: Yeah. But the difference was that he didn't have difficult courses, and he didn't study much for those that he had.

Maniscalco: Oh, really? Do you remember what he was going for?

Harrington: No, I don't remember exactly. Maybe sociology. I don't know.

Maniscalco: You know, agricultural engineering is pretty specialized. You know, you'd tell people, "I'm going to be an agricultural engineer," and what kind of reactions did you get?

Harrington: Oh, I don't know. There's different things you can do in agricultural engineering. I was specifically headed towards machinery, but others were going to soil and water, and some on farm buildings, and some on—I'm using the terminology of the day when I went there—and the other is rural electrification. So at the time I went, there were really four directions you could go.

Maniscalco: Now, that reminds me. Rural electrification—probably as a child, did you have electricity on the farm?

Harrington: Well, realize farmers were poor in those days, but I never lived in a house that didn't have running water, that didn't have electricity. But it wasn't the same. The running water was manually pumped up to a horse tank in the girls' bedroom, but you had pressure water and you had a bathtub, and you had water in the kitchen. And the electricity was what they call a light plant. It was a gasoline engine in the basement with—it was thirty-two volts and a whole bunch of batteries—similar to car batteries, but not car batteries—but that kept charging, and from that, we had lights and an iron. We had lights in the barn from it. Then rural electrification, REA, came in in about 1940, and then it was 110 volt, like today. And at that point, we got a refrigerator and...

Maniscalco: Was it an exciting thing to have REA come through, or was it kind of just...?

Harrington: Oh yeah, it—110 was way better than the one where you have to have an engine in the basement running it.

Maniscalco: Do you remember your parents or even you talking about, "We're going to be getting this 110 electricity?"

Harrington: Yeah, yeah.

Maniscalco: Was there speculation on what you could do, or...?

Harrington: No, they were pretty well-informed. My dad was on the REA board for part of the time, so he was... He was very civic-minded. He was always on the school board and some agricultural organizations.

Maniscalco: Now, you finished college in what year?

Harrington: 1950.

Maniscalco: In 1950. Where did you go to work after that, or what did you go do?

Harrington: A week later, I was working in Moline. Let's see, we were at...fifteen, sixteen...thirteen blocks that way and one block that way. 301 Third Avenue, Moline. Again, remember, this is a different day, and we were in an old basement that had previously assembled Velie cars. And Velie was a relative of John Deere. And that was all over. But we were in this basement, and I just thought it was the greatest. Well, that was until I found out (laughter) what was the greatest. (laughter) We had no air conditioning, and the heat didn't bother us as much as the humidity. Because if you're on a drafting table, which we were, your paper puckers up, and (laughter) when it bulges like that, it's hard to keep straight lines and so on. And then in the wintertime, they had heat, even if they didn't have air conditioning, but then it dries out, and it's tight. So it's not the best place to make drawings. But it was an excellent place to work.

The guy who was in charge was from a farm in Ohio. He was a graduate of Ohio State. And this was a period when farmers were really buying machinery. Going farther down the street to Rock Island, Farmall Works, by International Harvester, they were making 300 tractors a day. That was the peak. The early fifties were the peak sales for farm tractors. Well, and they would sell related equipment to them, too. But you had the boys home from war, they wanted to do better, farm income was good, so business was booming. Well, with that then, you had an atmosphere where companies were willing to invest in engineering to develop new equipment, equipment farmers hadn't had. And so it was an ideal time to be a young engineer.

Maniscalco: Now, fresh out of college and everything else, how did you find out about the job?

Harrington: Well, I'll back up slightly and say that I had worked all three summers in engineering-related jobs. The first summer, I worked on an experimental farm; the second summer, I worked in a test laboratory; and the third summer, I worked in a service department. And I knew, of course, who the big companies were. We had John Deere machinery, we had International Harvester machinery—and then some other brands, but those would have been the key ones. And the schools are aware of how to write to John Deere. I interviewed two places at Deere and chose this one because I thought it was a lot more exciting. I had another offer from IH; I had an offer to be chief engineer of a one-engineer outfit that related to the summer that I worked in the service department for a small company.

Maniscalco: Wow, so they were looking to kind of snatch you up. (laughter)

Harrington: But I couldn't have asked for a better group of people to work with and projects to work with.

Maniscalco: So what exactly was your job duties when you got there? What exactly were you doing?

Harrington: Okay, Deere had been making square balers, but unlike the competition, their baler pushed the bale out sidewise, and it must have had some advantages, but it also had some disadvantages. So they decided that they had to have one that was similar to competition. And so I made layouts on it. You have to make a drawing of the entire machine, and then people make drawings of the individual parts. And so I made layouts on that. And then we would make a

machine, and take it out to the field, and test it. So I thoroughly liked the idea of both designing and testing with the same people. Right outside our drafting room, we had a good machine shop. But again, it was old equipment but talented people, so we could... And, in the Quad Cities, there were pattern makers and different people you could send work out to if you couldn't do it. But that was the first project for the entire department. Then we started working on different things.

The next job I was on was tractor seating—tractor seat suspension. We built a test stand where we could vibrate it, and we would go to the field and measure what actually happens to the farmer, and—with an accelerometer—and come back and more or less duplicate it on that, and then change your design. Well, that was successful enough that that seat suspension was used on eighty different Deere machines for a period of two decades. Now, today—when they first came out as a fifty-dollar added cost to get that, relative to the base seat. Today, you can get a much better seat for $5,000 added on. (laughter) But the one today, if you were going across corn rows, it will soon sense that there's going to be another corn row, and it corrects for that. It's way better seating than cars or trucks have.

Maniscalco: So, you know, you're in this engineering department, kind of designing new parts of tractors and new designs for implements and things like that. What's the process? Who's deciding what you're supposed to design?

Harrington: There's a vice president of engineering, and there's a product planning department. Those were our two main outside contacts, plus the factory that's going to build it. When we worked on the baler, we knew it was going to Ottumwa, because they make hay tools. And when we think we have it in great shape, we turn it over to them, and they do at least another year's work on it before they put it in production. And in the case of the tractor seat, you know, it's going to Waterloo, where they make tractors, and they did more work than that.

We were doing tractor seat work in 1953; the tractor came out in 1960. It had a lot of birth pains. It was a revolution in tractor design, and they had gone for years with two-cylinder engines, and the farmers that owned them loved them, those that didn't, thought they were crazy—because they went "putt-putt, miss-miss, putt-putt, miss-miss." So they had to have the new ones just right. And when they came out, they were just right. But it was a slow birth. So they did a lot of work on the durability of the seat suspension and all.

Maniscalco: In terms of tractors, and kind of going from the early tractors all the way up through history, you know, there's been lots of changes. And actually, as we were walking in here today, I saw some of the older versions compared to the newer ones, and I was just like, "Oh, my gosh. They're totally different!" Can you kind of maybe discuss that a little bit? Maybe what you've seen?

Harrington: I could take you clear from 1837 to now. (laughter) But on tractors, the threshing was a big problem, and so for that, they used steam engines. And steam engines got pretty well refined, and I think they peaked out in sales maybe 1906 or something. And Case was the big name in steam engines. But the problem with those were that they were slow, they were clumsy—but they had made them well enough that they were very dependable. But we had a steam engine come to our farm to pull out a hedge fence, osage orange. And it takes about an hour to get them going in the morning. You've got to get water for them, and you got to get coal for them, you've got to get the water up to temperature, and then you can start work. Well, now, you turn the engine, and one minute later, you're full power and off you go.

Well, then people started building tractors that looked ugly and awkward—and they were both. And at the end of World War I, there were 100 tractor manufacturers. And unfortunately, more than half the business was taken by one—that was Ford Motor Company with their Fordson. Well, it was a more polished design. It wasn't very good, but it was about as good as any other, and much cheaper. Well, it was about that time that Deere gets in this huge debate, about like Washington, D.C. today, as to "Are we going to get into the tractor business or not, or is it just a passing fancy? Half of them break down, and they aren't dependable. Let's stick with horses. We've got the equipment; we're doing a good job." The head of Deere & Company at that time was violently opposed to them. The other people who were working with him were violently for them.

So they bought the Waterloo Boy. Well, it's not a very good tractor. It's terribly awkward, and it's not too durable. And they didn't sell a lot of them, relative to Ford. But it got Deere a factory, and they engineered a Model D that came out in '24 that was a very good tractor, good enough that it was still made in 1953; although there had been updates, but the basic design held. And then they came along with—well, competition again. Farmall came out with a row-crop tractor, something you could use to cultivate corn, which you couldn't with any previous tractor. So Deere came out, "If Farmall's going to cultivate two rows, we're going to cultivate three." Well, all I say is the D was very good; the GP was pretty poor. And it was not a commercial success. It's great for collectors—collectors love it more than almost any tractor, because there aren't that many of them left. And there was one thing good about it—it was the first tractor that had a power lift. If you're going to lift three rows of cultivators, you needed a little help.

But then later on, they came out with an A and B, and they were very dependable, and they were easy for a farmer to fix. If something went wrong, he could take one apart on a concrete floor, or maybe a dirt floor, lay the parts on the ground, and put them back in, and the thing would run. And they came out with some innovations on those. They had a good hydraulic lift for the cultivator, and then they had remote cylinders, where you could have a hydraulic cylinder on a disk or any trail implement, and control it from the tractor. So farmers that owned them really liked them. But there was really a limit on how high you can go on two cylinders that are "putt-putt, miss-miss." So in the early fifties, they decided to work on what they called a "new generation." And that's what came out in 1960.

Maniscalco: So what's the new generation of tractors? What were the things that it had?

Harrington: The things that it had—were especially strong in hydraulics. You had power steering on all of them. You had hydraulic brakes. You had better remote cylinder control. I mentioned the tractor seat. We also worked on ergonomics in general, locating where is the best place for the steering wheel, the brakes, the clutch. The previous John Deeres, your left foot—you have steering brakes to turn sharp. Your left foot was for the left brake, your right foot was for the right brake. Well, all of the competition had both of them over here, and the new one was like that. And the new one had eight speeds forward, and you could shift on the go. Nobody else could shift on the go. It was synchronized shift. And so it just made it way more convenient to run. And four years later, they updated it to what became the—there were two basic sizes of—3020 and a 4020—and by now, the 4020 was ninety-one horsepower. Well, when we were selling lots of tractors in the fifties, they were below fifty horsepower. So we really upped the work capacity.

And the 4020 is probably the most respected tractor that was ever made by Deere or anybody else. It was a really good tractor. And one of the things that came out with it that we did some work on, but not a lot—and that was a roll guard. What happens if you turn over a tractor sidewise—which happens, and it's possible to flip one backwards—that's not as common. But with this roll frame, it keeps a tractor for continuing to roll sidewise, and therefore, it cut fatalities a lot. Then the next tractor that came out after the 4020 had a good cab with the roll guard built in. And for years after that—well, and other companies came out, too—and for years after that, no one had ever died in one of these that had the proper cab.

That might bring up another subject. Something that is done for safety—even though we hold the patent, it's given free to all our competitors. Now, I'm not sure how that got started, but there's what's called American Society of Agricultural and Biological Engineers that makes standards for tractors and implements and several other things. But with that, a lot of the emphasis is on safety, and then the other big emphasis is, "If I buy a green tractor, will my red implement fit it?" And so they've standardized the draw bar and the three-point hitch and the hydraulic connection and things like that, which helps the farmer.

Another thing that I worked on that illustrates the safety—I worked on PTO shielding. That's the connection of the drive shaft between the tractor and the implement behind it. And what they'd been using was a tubular shield that was on either roller bearings or ball bearings, and some farmers would oil them, some would grease them, some would run them dry. If you oil or grease them and they pick up farm dust, and they lock up. If you don't, they rust up. So in my summer's experience on service, I had worked some with nylon. And I can't remember exactly how they used it, but anyway, we put nylon bearings in there, and now that's used worldwide by all manufacturers. You can go to China, you can go to Russia, you can go anyplace. You find their PTO shields have plastic bearings. So. And again, we had very good patents on it; given freely to all competitors, because it's safety.

Maniscalco: That's pretty cool. Now, you've mentioned a lot of things about tractors that are really interesting parts, and I'm going to ask you about them, and I'm wondering if maybe you could explain them a little bit more—at least in a little more detail. And one of the largest, from what it seems like, is the inception of hydraulics into tractors. Can you kind of describe what the hydraulics did for the tractor?

Harrington: Okay, in the first place, the earliest hydraulics, on the old two-cylinder tractors, you had to have the clutch engaged to get them to work. Well, that's not so good, because you might want to raise it without moving forward or shifting to neutral and clutching. Then the next step was live hydraulics—the pump was running if the engine was running. And then when this new generation of tractors came out, they put the pump on the front of the crankshaft, and it was a piston pump that pumped only when you needed it. It kept the pressure up, but it didn't flow oil unless there was a need for it. It was closed-circuit hydraulics. And that had quite a lot more lifting power and speed and so on, and it used oil out of the transmission. And the whole system really worked beautifully. But then we come along later, and instead of one remote cylinder on something like a wide platter, you might have two or more cylinders. I mean, you definitely have two. And several other machines—you'd have more than one. So you've got more hydraulic controls and better controls. You have what they call a draft control. Whenever you'd have a three-point hitch, you can set it so that if the draft is too great, it raises the implement some. And that was more refined on the new generation of tractors.

Maniscalco: Now, you just mentioned it, and this was the next thing I was going to ask you about, which is the three-pointed hitch. Because that kind of changed tractors quite a bit.

Harrington: Made tremendous change. Ferguson in Europe was the inventor of that. And he had a poor marriage with Ford, and they split. But that's the origin of the three-point hitch. Deere was pretty slow to adopt it; IH was slow to adopt it; Allis-Chalmers was slow to adopt it. And each one of them had some system, but it was not as good. The three-point hitch was extremely clever, and it's still in great use today.

Maniscalco: Can you explain kind of what the advantages of having a three-point hitch are?

Harrington: Well, with that, you have a mounted implement that in transport doesn't run on wheels; the tractor is carrying it. And I have a—well, I still pretend-farm, and mow thirty-five acres. Okay, I have a Massey Ferguson industrial tractor with a good three-point hitch and a PTO that I say one of the standards has been I can fit some other brand of implement behind it. So I have a John Deere rotary cutter—seven feet wide; it will cut things as big as four inches and not hurt the cutter—which is highly desirable if you're going to mow under a lot of trees. But anytime I want to raise it up, I just go like that, and up it comes. And you can carry it, or just getting over something, or whatever. And you could raise it a little or you could raise it a lot. It's a control. And you can set the bottom how far down it goes.

Maniscalco: That's very interesting.

Harrington: But that's used lots on tillage tools: chisel plows, field cultivators, moldboard plow. Moldboard plows were the first big use of it.

Maniscalco: Now, you were mentioning, as we were going through this, and you came to quite a few innovations for safety, and you mentioned that if you came up with an idea for safety, John Deere would make it public. When did this idea that tractors needed to become safe—when did that kind of come about?

Harrington: I don't know, but the power take-off is especially deadly—the shaft that goes between the tractor and the implement. And I think International Harvester had the first power take-off. But there would have been deaths on those, because they weren't shielded. Farmers were maybe a little more fatalistic in those days than today. (laughter) But that's no excuse for making things that way if we know how to do better. And another thing that was rough on farmers was corn-pickers. They would plug up with stalks, and the farmer would grab the stalk, and although you can't understand it, you cannot let go of the stalk as soon as it's yanked this way. Your automatic response is to grip it harder, and so in your hand goes to the picker. And a lot of farmers lost a hand or an arm. Now, that's been eliminated by the—to me, the greatest change in farming in my lifetime has been the introduction of corn heads for combines. Before, my father picked corn by hand. You'd have a wagon going along beside you, and pick, and throw in the wagon, and tell the team to go forward a little, and more. A real good man can do 100 bushel a day. Well, then corn pickers came out, and of course, they were much faster than that, but they were really limited to two rows mounted on a tractor, because if you had more than that, it weigh so much that it'd get stuck on the field. The front wheels of the tractor don't have a lot of support in the mud.

Well, our department worked on a corn head in the early fifties. Deere was slightly the first, before IH, coming out with a corn head. And that really revolutionized corn harvesting. Because we visualized a two-row, which is what we built. It not only picks the ear, but it shells

it. So you've done an extra operation. And the combine, instead of having two little wheels up front, has two big wheels up front, so it can go through much softer ground than a tractor. Well, that's evolved from two-row to four-row to six-row to eight-row to twelve-row—and twelve-row wouldn't be our most common, but we sell them. So that's greatly improved the capacity to harvest corn, and harvesting is the limitation on how many acres you can go—you've got to be able to harvest it all.

Maniscalco: I'm kind of interested—now, you were in the engineering department, and let's say you're sitting there and one of the other departments comes to you and says, "We have this problem we've recognized with our tractor, and it's some kind of operational problem or safety problem or something. What's the process that your department would go through to try to come up with an idea to—or a design—to fix it?

Harrington: We didn't—each of the factories had their own engineering department, and so within a given product, we would not have been asked to solve it. Now, why did we get off onto tractor seats and operator controls? Well, there's an explanation for that. Waterloo was very secretive about developing their tractor, and we had to do testing of seats and so on, which we could do here where people aren't thinking about, "Why are these crazy nuts out there on a cold day sitting real still while they balance out on an oscillograph, with an accelerometer on their back?" because we do nutty things here at the experimental farm anyway. But it was were remote from where some people thought Deere's got to do something other than a two-cylinder tractor. So we got that segment of tractor development. That was an exception to the rule. We normally were given a job... We worked on several projects that worked, we worked on projects that went in production but didn't make the company any money. (laughter)

I said we started off with a baler. We followed up on that with a bale-thrower. With a baler, you have a man on the tractor. He's kicking out bales. They either go out on the ground and you pick them up, or they can be pushed up a ramp, and a man on a wagon behind can pick them up and stack them on the wagon. Two-man operation. Well, there's always the desire to be a one-man operation. So we worked out a bale-thrower that threw them in the wagon. And that added an interesting thing relative to patents on it, because our patent attorneys said, "Man, we're so first on this that we really got [great] claims. If anybody else wants to throw a bale on a wagon, they're going to have to dribble it first." (laughter) Well, anytime you're cocky, there's a fair chance you're going to get in trouble. Well, ours really was pretty clever. It had a finger that when a bale came along at the right place, then it would throw it. That sounded like a good idea. Within two or three years, our two main competitors, IH and New Holland, were throwing bales in wagons. Ah, but they were dumb. They didn't know a bale was there. They were always throwing. (laughter) One of them put a belt above and a belt below, and they were always running, and whenever a bale came along, there it went. And the other one used rollers. Neither one conflicted with our patent; we had no complaint. (laughter) We were sad, but they didn't violate our patents. So there is a lot of interesting things that come along doing engineering.

Another machine we worked on was a hay cuber. You've seen pellets for—well, cattle feed, or other things. Well, we learned how to make pelleted or cubed hay. And we envisioned selling it in the Midwest, where most of the hay is grown, but in multiple summers of testing, we only had one summer that we succeeded in making them here, and they all molded afterwards. (laughter) So it turned out the mass market was not with us. Now, we got to Arizona and California, where they grow pure alfalfa, irrigated, we could make beautiful cubes that didn't

spoil—it was a dry climate—and for a while, there was quite a market of shipping them to Hawaii. And Deere made it for several years, but my guess, in total, they never made any money. Eventually, they sold the outfit. And I don't think there are any field machines operating now. It takes a lot of power relative to other means.

Maniscalco: You know, it reminds me, one of the first things that actually John Deere started was actually with implements and a plow. What about some of these ideas for implements? What are some of the ideas that your department had seen, or you've seen, come through the shop? You know, some of the wild ideas for implements.

Harrington: Well, I guess we didn't think that things were wild. (laughter) We were allowed to stretch our imagination. We worked on several things. We worked on a tobacco harvester, and dropped that partly because smoking was becoming unpopular—and it should have been. And then we worked on a more or less universal corn harvester that you could get ear corn, shell corn, or silage, and that wasn't made. There were too many compromises. So we were allowed to stretch our mind and try some unusual things.

Maniscalco: Being an employee for John Deere, what advantages does this company have over some of the other ones, in your opinion?

Harrington: Well, I was always treated equal to or better than I should have been. (laughter) Here's an example: I took a leave of absence in the middle of my career, worked five years in India, leave of absence. And so I come back, and I'd been here maybe a year or so, and personnel called me up and says, "Well, due to a technicality"—well, anytime anybody says "Due to a technicality," you're going to lose ground. But they said, "Due to a technicality, you picked up vacation time during those five years." So then I went along maybe another year or so, and I get the same call. "Due to a technicality, you picked up retirement time during those five years." And now, good pension, good health plan. I've always been treated very fairly.

Maniscalco: Now, you mentioned you went to India.

Harrington: Yes.

Maniscalco: What did you do in India?

Harrington: I don't know if you've heard of the Green Revolution. Anyway, at the time we went to India, they were importing lots of food from the U.S. to keep from starving. And there's a guy there's named Norman Borlaug from Iowa State who had worked a lot on new wheat varieties in Mexico. And there was a place in the Philippines working on new rice varieties. Anyway, I went over there as one of twenty people in Ford Foundation's Agricultural District Development Program. And we had five districts in the country that we were supposed to try to see what we could do to help farm production. And I specifically was on farm machinery. And we had great success in some districts. By the time we left, five years after we went there, they were growing enough food for the people, and it kept building after that.

Okay, what were the emphases? New varieties of wheat, new varieties of rice, fertilizer, and what they called plant protection. Anyway, if you have an insects problem, they'll spray for it, or weeds, or whatever. But on the farm equipment side, I promoted—well, I won't tell you the whole story—but one of the things I did was promote the use of tractors—in that their season is such that you could grow two crops, but you don't have time to. With a tractor, you do. I brought along a photo to show you where they were in 1970.

Maniscalco: Oh my gosh.

Harrington: And that's the best state in India. And that's where we were in 1837. We were using what they call bullocks over there and what we call oxen here. If you look at some of the artwork for Deere's first plow, it's oxen. And we were planting by hand. He's planting wheat there. Okay, that's where we started off at the time of John Deere.

Maniscalco: Wow, wow.

Harrington: And now, India—I suppose at least half of the Indian farmers are still at that stage. Whenever they're putting in rice, they transplant each individual plant, and it's very laborious. But the tractor business over there is booming. They make more tractors now than any other country in the world. They're about the size that we had in the thirties and forties. Which is the right size for them. They have small farms. They don't have the option of buying up the neighbor's farm like here, because there's not that many jobs if you're not farming.

Maniscalco: And that brings me back to kind of an idea. Throughout all of your design work and everything else, you've always had to keep farming and the farmer in mind.

Harrington: Absolutely.

Maniscalco: Obviously, you were successful in doing that. What did you do, to kind of keep doing that?

Harrington: Well, we would always test on farmers' farms. We had an experimental farm out south of town that we'd do initial testing on, so you wouldn't look completely stupid. (laughter) Well, and there was a good shop there where you could cover up some of your errors. But we were always working with farmers. Before you come out with something like a hay cuber, which is utterly different, you go out and quiz farmers: "If we could do this, would you be interested in one?" or "When you make hay, what's your biggest problem?" or "How do you transport hay?" The big deal on hay cubes is that you could transport it. It was more or less like shell corn. You could elevate it—you could do lots of things you can't do with loose hay. But the product planning department spent a lot of time with farmers. When I was both in product development, which is what we've discussed mostly, we would visit dealers each year and get their ideas, and maybe they would point us to a farmer that says, You got to do better for cultivating tomatoes, or whatever—whatever the thing is. And you go listen to him, and does he sound like a rational farmer who's thought this through, or has he just got a temporary problem on his land.

Maniscalco: Well, that's interesting. You know, obviously, you've worked on a farm, you've worked on designing things for farms—you know, the tractor, and even these seats that you designed and other things have changed farming immensely. So I'm kind of curious what you think the future for farming might be. What are some of the future ideas that might be coming down the road?

Harrington: I don't know; it's already gone beyond my imagination. (laughter) Well, it's getting more and more computerized. The old John Deere A and B didn't even have a battery on them. (laughter) They used a magneto to get a spark. Anyway, in the nineties, we came out with what's called GreenStar. It's a GPS system. And its first practical application was in combines, where as you go through the field, you have sensors in the combine that measures the rate of grain coming in the grain tank, which converts it to bushels per acre, and then at the end of the day, you take out—I'm not sure what they take out—some little chip, and go to their computer

at home, and you can print out a color yield map. And it'll show you your boundaries of the field and everything else.

And there was a lot of excitement over that. A man with that, if the yield of the corn here is 100 bushels an acre and it's 150 over there, we're going to pour more fertilizer on the under. Then competent agronomists, says, no, you pour more fertilizer on the 150. It has the potential to do it. There's something wrong with the 100. It needs to be drained, it's clay soil—there's something wrong with it. Fertilizer won't solve it. Well, so it wasn't the panacea that they thought at first. But they've learned more and more about it. But one of the things then was developed was the ability to adjust rates with GPS. Okay, what rates? Fertilizer, rate of seeding, the rate of spraying.

So that all came in the nineties. In the 2000s, we can go with our tractor and go through the field, and it weaves around a little, but we've turned it on, and we get to the end of the row—we're planting, now. And it used to be we had a two-row planter and a marker, and you just drive your front wheels in the mark. Well, if you have a 24-row planter, you can't see where that marker is. So you get to the end of the row, turn around, it will follow this slightly serpentine path back to the other end. And you get to the end, you press a button, it will lift your planter out of the ground, turn your tractor around, and away you go.

Now, what's probably more important than that, because it's wider—we made commercial self-propelled sprayers. Some farmers own them, but my guess is most of them go to customer sprayers. There, they may have a boom that's 120 feet wide. Well, there's no way that you'd know exactly where that was, and you're driving much faster—you might be going fifteen miles an hour. And you come to the end, and you go [turn] around, and it's offset the right distance. So there's more and more of that, there's thought, Maybe we're getting so gosh-awful big that I don't want more than a twelve-row corn head. Maybe I ought to buy two combines, but I don't want to buy another operator. Maybe I'm running one, and the other's a robot that I'm watching.

So it's a little hard to guess what's coming next, but it's a little hard to believe that we can keep going wider. Because we have implements that fold up. Well, we have field cultivators that fold once this way, once this way, and then of course there's one there. So there's five segments there. How much more can you go? And you've got to get under power lines and be able to go down the road.

Maniscalco: So being a farmer yourself, as you said you are, how do you feel about a lot of these changes? I mean, you've gone from horses all the way up to these big GPS tractors now. How does it make you feel?

Harrington: Well, I guess I don't long for the olden days. (laughter) The farm that I work on is part of the farm my wife grew up on. And in fact, I married the farmer's daughter. This was where I worked the first summer I was in college. He ran an experimental farm. But anyhow, the farm family that moved into the house she grew up in are the same kind of folks that we had when most farms are 160 acres. We had 520, but... Anyway, they're hardworking. People see these farmers running around in an air-conditioned cab, and they think, Boy, there's no work to farming today. Well, there's a lot of work getting that tractor ready and getting that combine ready, and these people are very religious about off-season—preparing for the coming season, and getting everything tuned up, maintained, so that it doesn't fail during the harvest or during

planting. And they work year-round, just as hard as we ever did. They farm lots more acres, much bigger equipment.

Maniscalco: So do you think there's been kind of a change in what the makeup of what a farmer was compared to is now?

Harrington: I think the basic farmer hasn't changed a lot. He's still a real hard worker and a good neighbor. We couldn't ask for better neighbors than this family.

Maniscalco: We're kind of getting to the end of the interview now, and I always ask a question of everybody, and this is kind of your opportunity. Because this is an oral history interview—this is going to be included in the Illinois State Museum for time immemorial—it'll be there forever. And maybe one day one of your great-grandkids or great-great-grandkids could walk in the museum and look on the shelf and say, "Look, there's Grandpa Roy up there on the shelf." And if they were going to watch this interview or listen to this interview, what's the thing that you want them to have in this interview, or that you would want to leave for them in this interview?

Harrington: Well, I thoroughly enjoyed my working career. The people I worked with, the type of work I was doing, the opportunities that came after I retired from Deere. I think you should work on what you enjoy—don't worry about the pay, it'll come to you—but never get in a dead-end job that you don't like.

Maniscalco: Well, thank you very much, Roy. It's been a lot of fun sitting here and talking with you.

Harrington: Thank you.

(end of interview)