

**Born**

19 April 1949  
New York, New York

**Current Positions**

University Distinguished  
Professor,  
William Neal Reynolds  
Professor of Entomology  
and

Co-Director, Genetic  
Engineering and Society  
Center  
North Carolina State  
University

**Students and Postdocs**

M.S. 10, Ph.D. 25  
Postdocs 22

**Refereed Publications**

211; 9 in PNAS or Science

**Highly Cited Paper**

*Sustainability of Transgenic  
Insecticidal Cultivars:  
Integrating Pest Genetics  
and Ecology*

1,534 citations

**Book Chapters**

29

**Invited Presentations**

More than 325

**Honors**

Fellow, Entomological  
Society of America (ESA)

Fellow, American  
Association for the  
Advancement of Science

Elected to the National  
Academy of Sciences

**Awards**

George Bugliarello Prize  
(Sigma Xi)

Alexander von Humboldt  
Award

Founder's Memorial Award  
(ESA)

Borlaug Award for Service to  
Society and Environment  
(NC State)

O. Max Gardner Award  
(NC State faculty member  
with greatest contribution to  
human welfare)

# Fred Gould: Indeed, I Was a Hippie

Marlin E. Rice

**R**esearch scientist Fred Gould began his career studying the evolution of spider mite host range and its relationship to the development of insecticide resistance. Currently, he is University Distinguished Professor in the Department of Entomology and Plant Pathology at North Carolina State University (NC State) in Raleigh. He has earned degrees from Queens College, City University of New York (B.S., Biology, 1971), and State University of New York at Stony Brook, (Ph.D., Ecology & Evolutionary Biology, 1977).

Gould joined NC State as an assistant professor in 1979, initially as a soil-insect entomologist. In the past decade, he became the co-founder and co-director of the Genetic Engineering and Society (GES) Center at NC State. The Center has taken a national and international lead in examining the technical, ethical, and societal dimensions of the products and impacts of biotechnology by promoting inclusive dialogue among researchers and scholars in science and technology, social sciences, and humanities. Gould has been the director of two multimillion-dollar NSF graduate training grants. The first grant was titled “Genetic Engineering and Society: The Case of Transgenic Pests.” The second and ongoing grant is “Agricultural Biotechnology in Our Evolving Food, Energy, and Water Systems” (AgBioFEWS).

In 2016, Gould chaired the committee that wrote the National Academies of Sciences, Engineering, and Medicine report *Genetically Engineered Crops: Experiences and Prospects*. According to the Academies, “This consensus report examines a range of questions and opinions about the economic, agronomic, health, safety, or other effects of genetically engineered crops and food.”

At the 1994 ESA Annual Meeting, Gould and George Kennedy spearheaded development of a yearly student debate with the goal of enhancing critical thinking among

graduate students. To the current day, these debates focus on controversial science and policy issues in entomology and agriculture.

This interview occurred 3 April 2021 on the NC State campus, two weeks before Gould’s 72nd birthday.

**Rice: You grew up in New York City in the borough of Queens. What was your childhood like in Queens?**

Gould: My dad got married when he was 49. I was the second kid; there were three of us. I grew up in what I thought was a middle-class neighborhood and played on the streets. I played all those games that kids in cities played: stickball, stoopball, ringalevio. We were given free rein out on the streets; then, at some point—my father had this very loud whistle—he’d whistle and we all came home. [Laughs]. Actually, my dad bought a cabin up in Rhode Island, so it was where I went in the summer. So how does a kid from Queens wind up in agriculture? Before my teenage years, I started helping out on a small dairy



Fred Gould, here five years old, grew up on the city streets in Queens, New York City.



Fred Gould, Assistant Professor, North Carolina State University (1983).



Fred Gould, University Distinguished Professor, North Carolina State University (2020). (Photo by Christopher P. Michel)

farm in that area. Maybe about fifty milking cows.

**So you were milking cows?**

No, I was actually baling hay.

**I've done that, and it's a scratchy, dusty, dirty job.**

I know, but I loved that.

**What was the weight of these bales? Forty, fifty, sixty pounds?**

They must have been forty or less on good days. There were times when the hay wasn't quite dry and they would be impossible to pick up. My love was going up there in the summer—going fishing all day or picking blueberries. I loved being out in nature, but I didn't know anything about insects. Entomology for me only started in graduate school.

**You played on the streets of New York as a child. I assume it was safe; you survived.**

It felt safe. I was always building crazy things and experimenting. I built a crossbow when I was a teenager. My friend and I put a lawnmower engine on a bicycle. But I always worked on cars and motorcycles. As a kid, I worked odd jobs in the soda shop or butcher shop, but the first job I loved was working in

a motorcycle shop. At one time, I had three motorcycles.

**What was your favorite bike?**

I had Hondas, but craved Harleys. I was immersed in the whole car culture.

**There is a legend that you own a convertible Mustang and that you and George Kennedy have driven it very, very fast.**

[Laughs.] Yeah. It's a 1990 Mustang. I bought it used in 1997. It's got almost 300,000 miles.

**What has been your top speed?**

I don't go fast. You'll have to talk to George about how fast. He is one of the only people I let drive it. But it's not how fast you go, but how fast you get there. It gets there fast.

**You studied biology at Queens College in New York. Who was the person or what was the life experience that moved you into biology?**

I liked biology and took advanced placement biology in high school. My dad wanted me to be a doctor, so biology fit. My dad grew up, really, on the streets of New York. He was born here, but his sisters were born back in the old country, on the border of Poland and Russia. They were right out of *Fiddler on the*

*Roof*. They moved to the U.S. in the 1890s. His dad lost his leg in a sweatshop. For my dad—and you don't understand this when you're a kid—the idea of having financial stability was a big deal. My father was a dentist, and he changed his name from Gold to Gould because of anti-Semitism—you know, in terms of getting clients. He wanted me to be a doctor, so I was in pre-med, but that was the problem. [Laughs.] This was during the Vietnam War and we shut down the school. This was a very different time.

**Your lottery eligibility in the military draft was number 336, so you wouldn't have been drafted.**

How do you know this? You've really done your homework. This actually relates back to your question of who influenced me. I knew I wouldn't be drafted, and that gave me a certain amount of freedom. I was a long-haired hippie. I was supposed to go to medical school, but when we shut down the college, we had alternative classes. I had a couple of instructors that really affected me in terms of loving nature. Well, this botany professor taught a course called "Why I Love Bogs." He'd take us out on field trips in New York City that had surprisingly huge biodiversity, and he also had us draw plant structures. And I learned from that, how important it was to draw, and that all of a sudden, you'd see things you never saw before.

**When you say "shut down," was this in the form of protests?**

Oh yeah, every spring. I was involved in that.

**Were you carrying signs? Throwing rocks?**

Mostly sit-ins at university buildings, but I never got arrested. I was worried about that, because I saw myself as pre-med, and that would have killed it, right? So I wasn't that brave. When you're in a pre-med program, it's not necessarily about the love of the subject, it's about the direction you're going. In the meantime, I hitchhiked across the country and got even more interested in natural history. Between that and exciting courses in geology and ecology, medical school was losing appeal. You know, these were different days.

**Did you hitchhike all the way to California?**

Yep.

### San Francisco?

Yeah, I got there the year after ... [Laughs]

### Haight-Ashbury?

I got there a year or two late, when drugs had taken over, but yeah, I was very much a part of that whole hippie scene. But I also was driving a cab in [New York]. I did this when I was in college for extra money, and I did it after I got out of college. These were different times.

### Is this a Yellow or Checker cab?

Well, actually, I worked for a company that had both.

### In 1971, the year you graduated, and you were still driving, the city's Taxi and Limousine Commission reported 2,311 robberies of cabbies. This is a dangerous job.

[Laughs.] Actually, one of my friends got robbed. I don't know how to put it, but I was driving a motorcycle at the time, and I did crazy stuff. Also, at the time I was delivering

liquor in the city on my motorcycle for my uncle. Around Christmas, and there was snow, I wound up under a truck, on my motorcycle, because it was wet. In some ways I don't think I recognized [the danger]; it was the adventure. At one point, after I graduated, I turned down medical school and was driving a cab full time, and it was kind of depressing. So I took off to Europe, worked picking grapes, worked with the Salvation Army there, and lived on just enough money to get by.

### You were a hippie in Europe.

Yeah, but I came back and started driving a cab again, and then I got a job in a psychiatric hospital being a driver. The outcome of that is I didn't go straight into graduate school, and when I did go to graduate school, I didn't go there actually to get a degree; it just seemed like a great gig. So they were going to *pay* me to take classes? That's how I started out. Of course, that changed.

### You've hitchhiked to California and then spent time in Europe. Why stay home for graduate school?

All of this is very serendipitous. I know this sounds crazy, but we were sort of a lost generation. Actually, a friend of mine had two extra applications for graduate school. One was for Stony Brook, and I thought I could learn ecology. To me, ecology was what this botany professor did. Why didn't I go back to Europe? There was no pull to go back. It's not like I looked around and figured out what's the best graduate school. I applied to Stony Brook because this guy had extra applications.

### Describe the graduate school experience at Stony Brook.

Again, the serendipity of going there. The person that interviewed me at Stony Brook was very direct, not what we would call mentoring and caring. "Right, you want to come? Come. There's a dorm over there. You can stay in the dorm." But I went to have lunch, and a person from a lab I had visited on my campus tour saw me and invited me to join him and some other longhairs. I said, "I don't know about this place." And they were commiserating that it's not exactly the warmest place, but invited me to come out to dinner at their house. Well, they had this little communal house. After having dinner, they invited me to join them the next year, so that changed my mind. Indeed, one of those folks was a new assistant professor, Doug Futuyma. At some point, I went to Costa Rica with the Organization for Tropical Studies, and coming back from there was when I had this *conversion* of how I'm living. That's when I bought a bread van and lived in it. [Laughs.]

### But did you enjoy Stony Brook?

It was really a wonderful time. I developed great friendships there, and we had a wonderfully collaborative group studying plant-herbivore interactions. There were some bumps in the road with the department requirements and I almost got kicked out twice. One was the qualifying exam. The other was the department's directive to incoming graduate students to think about the most important question in ecology and evolution, and then write a proposal to address that question within two years. The problem was, I couldn't come up with a thesis proposal that I liked. Well, if you don't have that, the rules are that you're out. I finally came up with one I *didn't* like just so it

## "I TURNED DOWN MEDICAL SCHOOL AND WAS DRIVING A CAB FULL TIME."



FRÉDÉRIC PROCHASSON/ADOBE STOCK

would work out. My advisor said, “Fred, I can really tell you don’t like this.” And he gave me an extra six months.

### Tell me about living in a ramshackle bread van.

It was old. Even at that *time*, it was old. It would break down, but in those days, you could work on an engine. I parked it out on Long Island, beside a farmhouse where I used their shower. I had chickens. This was a different era. I was indeed what you would call a hippie, but that was just an attitude toward life. At the same time, I was working on spider mites and trying to understand the genetics of host-range evolution, whether it could be predicted. When I was finishing my Ph.D., I wrote a proposal to NSF to work on whether *Heliothis virescens* resistance to organophosphates due to mixed function oxidases had resulted in a change in its tolerance of plant toxins. And it was funded. So, as a good hippie—come on, what do you want to do? Head out to the West Coast. Who better to work with than Carl Huffaker and John Casida at [University of California] Berkeley, because I’d have experts in the ecology aspect and the toxicology aspect. Huffaker said, “No, work with Marjorie Hoy.” I contacted her and I thought we had a deal, but that didn’t work out.

### She just dropped you?

And I couldn’t understand it, because I was bringing my own *money*. And you know, this is Berkeley, and at the time, toxicologists and biocontrol people didn’t necessarily get along that well. It wasn’t clear. But another school with good faculty for this proposal was in Raleigh, so I came to Raleigh and met with Bob Rabb, and there was no more of a southern gentleman. He said, “You know, we try our best to do science down here in North Carolina, but it’s not Stony Brook. Let me take you down and show you our rearing facility.” It was fabulous. I had been at Stony Brook; there was *no* rearing facility there. He was playing on me, you know, that whole underselling of the South. And then he said, “Okay, let’s go over and see Ernie Hobson,” who was a major toxicologist. Before we got to talk about my project, the two of them started talking about how to exchange Bob Rabb’s key for his mountain cabin so that Ernie could stay there. I thought, “I’m here! Here’s this biocontrol person and a toxicologist sharing a cabin in the mountains.” That sold it. The Berkeley faculty couldn’t work



The ramshackle bread van that Fred Gould lived in during graduate school, and then as a postdoc at NC State (1977).

out taking a postdoc with his own funding, and here these two are buddies. No contest.

### Did you arrive in North Carolina with your ponytail?

My ponytail and I were living in my bread van. Dr. Rabb didn’t say anything about the ponytail. I’ve thought about that during my career. My sense is that Bob Rabb was thoughtful enough to see beyond the ponytail. I’ve had students with piercings and with tattoos up and down their arms. It’s the person behind the tattoo that matters, right?

**You have stated that your interests are the solution of agricultural problems and alleviation of insect-borne human diseases. What do you consider the most significant agricultural problem, and do you foresee a solution?**

[Laughs.] That’s a tough question. I think the most severe problems now are in forestry, not in row crops. With insects and plants, we’re just not devoting enough to understand these issues in forestry. But in agriculture, I think the biggest issue has to do with conservation of topsoil. But entomologically, I would say the overuse of neonicotinoids. And as much as I’m a *critic* of how transgenic crops have been *used*, I’m a fan of transgenics in the sense of using them right, using them

appropriately. I can see that they have a great role. I was the chair on the Academies report on genetically engineered crops. That committee did great work to present the nuances involved in assessment of engineered crops and foods. A big shift for me was switching from working on engineered plants to transgenic insects: could you genetically engineer an insect for its own demise or to not transmit diseases? But this was all going to happen in the dark *shadow* of genetically engineered crops and public anger at Monsanto. The question was whether we could develop and utilize transgenic insects in a way that got out from under that shadow, and that was a big motivator for me.

**You were co-founder of the Genetic Engineering and Society (GES) Center. What do you hope to achieve with this center?**

This center is part of this same kind of issue that arose from transgenic crops: the pushback, and then the polarization. So I thought we had potential for a retake when genetically engineering insects came out, that we could do it differently. And that led to a conference in 2009, where we brought in groups that were critical of genetically engineered plants, and told them about genetically engineered *insects*. And we asked, “How could we do it in a way that it would

be acceptable to you?” It was a good two-day meeting, and it brought out people’s thinking. After that, I moved around campus finding social scientists and humanities people, and we wrote a three-million-dollar NSF grant. We got rejected twice before we finally got it, but that NSF grant resulted in the provost enabling us to hire three great new faculty in social science, and that was the start of the GES Center. How could we do genetic engineering more appropriately? Today, it’s called responsible innovation.

**You led the development of a university plan to implement a program called Ag-BioFEWS, which you described as an interdisciplinary graduate program on steroids.**

We got that one training grant to look at genetically engineered insects, right? This GES Center became a success story in terms of integrated, interdisciplinary work. And that lasted seven years and trained twenty-one graduate students in social sciences and biological sciences. When that was coming to an end, we realized that it was the students that pulled the faculty together. Our whole group decided [that] if we lose our graduate students, we’re going to lose our inertia, our steam. That’s when we wrote a new NSF grant, and we got that the first time. This was a real team effort. It wouldn’t have happened without the diverse inputs of our faculty members.

AgBioFEWS is broadly interdisciplinary, because our students are getting exposed to everything from public administration to molecular biology. We have students in fields including genetics, economics, entomology, public administration, and a program called communication rhetoric and digital media, and we have faculty across all those areas. And those students in communication take a graduate plant genetics course. It can be a challenge for them, but the funny thing is that some natural science students start out thinking that taking the social sciences class will be a snap, and then they find out how hard those are. They have to read more than they’ve ever read in their lives, and they realize that social scientists have as much complexity in their hypothesis testing as in the biological sciences. We want our students to be open to different ways of knowing what happens in our world. So it’s been an interesting experience. I’ve loved it.

**You have served on the Gates Foundation Target Malaria Program Ethics Committee**

**since 2015. What is the most challenging ethical question this committee has addressed?**

The biggest issue is whose voices count. So you want to release these genetically modified mosquitoes in Africa? Here are these colonial nations that have messed you up so many times that are coming to save you with a transgenic mosquito you don’t even understand, and they say it’s good for you? We don’t even have a word for “gene” in a lot of the languages. And we are not just proposing a genetically modified mosquito, but one with gene drive, which means once you release it, they’re out there with the goal to suppress and eventually cause extinction of *Anopheles gambiae*. In some sense, it seems like a no-brainer. There are some 500,000 people dying from malaria each year. So who should you ask permission from? How should you develop this thing? Whose are the voices that count? Is it the voices in the villages where you do the preliminary experiments? Is it the politicians? Who do you ask? If you do a focus group and ninety percent of



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the people want this, but there’s ten percent of the people that are really scared of it, how do you deal with that? Or if ninety percent are against it and ten percent see that this is the greatest thing, how do you view those ninety percent of the people? That’s the kind of question that goes back to the [transgenic] crop thing that we’re facing in Africa right now, too. Are we developing these crops for the poorest of farmers or for those with the resources to buy hybrid seed and fertilizer? How do you move forward with these issues on an ethically sound basis, especially if you don’t know the cultures very well? It’s *hard*. So we do that in the ethics committee when we work with Target Malaria. Overall, I think Target Malaria is putting in a lot of effort to act responsibly. The ethics committee is still needed as a watchdog, because it’s easy to miss things or make mistaken assumptions.

**If you could conceptualize a novel gene drive mechanism, what would be the target insect and its functionality?**

I certainly think *Anopheles gambiae* is a biggie, right? We’ve been working on conceptualizing gene drive systems that are limited. They drive, but they disappear; or they drive, but they have spatial limitations. Interestingly, it’s easier to create a gene drive system that you can’t stop than creating one that will stop itself. So we’re at the baby stage now where we’re creating these ones that won’t stop. Of course, the goal may be persistence, but as with pesticides, these insects may become resistant to the gene drives soon after they leave the lab. I think using gene drives for where we’ve screwed up with biological control would be very nice—think of getting the cane toad in Australia. But in many cases, we only want to impact a pest where it is invasive, not where it occurs naturally.

**What would be your worst nightmare regarding a gene drive organism?**

All it will take is for one group to do it wrong in the beginning. That would put gene drive back in the shadows for a long time. Also, in the future, it could get too easy to do, and could be done by a single person. Think about that: someone could potentially get rid of monarch butterflies, just to be mean.

**Wow!**

Yeah. It’s curious, because people talk about bioterrorism—that somebody’s going to release some pest. You ask about a nightmare:

how about somebody releasing transgenic weeds with herbicide resistance just to spite Big Ag? I think about it in terms of the computer era and developing computers that were getting faster and faster, and nobody thought about hacking and viruses, so today we're in an escalating contest between hackers and governments. The question is, what happens twenty years from now? How do you control this gene drive technology? How's that for scary? [Laughs.]

**You are a distinguished professor of entomology, but there is a legend that you have never had a formal entomology class. Is that true?**

That is true. But I had a two-week intensive *acarology* class.

**I guess that counts.**

[Laughs.] NC State Entomology was ahead of many others in hiring somebody in an entomology position who didn't have an entomology background. If you're going to hire someone for thirty years or more, you should think about potential, not about what they already know about the specific discipline. I think about that interdisciplinarity; having that diversity helps.

**You lecture in a graduate-level class titled "Darwinism and Christianity." What is the basic premise of your lectures?**

This is a course taught in our philosophy and religion department, and I give lectures. I thought this was a good course to have, and this relates to my background. I was raised as a very Orthodox Jew, and when I went to college, my mind was just blown by the first English course I took that was taught by a faculty member who specialized in existential literature like Camus and Kafka. It shook my foundation about religion. And going home and trying to explain that to my family was not easy—I was sent to talk to the rabbi. This did not work. I've seen students at NC State who come from very religious backgrounds who take biology. And biology today is all about evolution, and I've had some students who talk about going home and trying to explain this to their families. In the course, I talk about the principles: how can you demonstrate that evolution has happened? What do we know? And at the same time, [we] talk about the things we don't know. I think we could do well in biology departments to have a course that addresses biology, ethics, and religion.



## ADVICE FROM A LEGEND

**Would a graduate student today with a singular focus on entomology potentially be at a competitive disadvantage in the job market?**

It depends on what that student wants to do. If that student just wants to be in the laboratory or in the field, maybe not. But companies are really interested in getting people with soft skills.

**What soft skills or characteristics do you look for in a student or postdoc?**

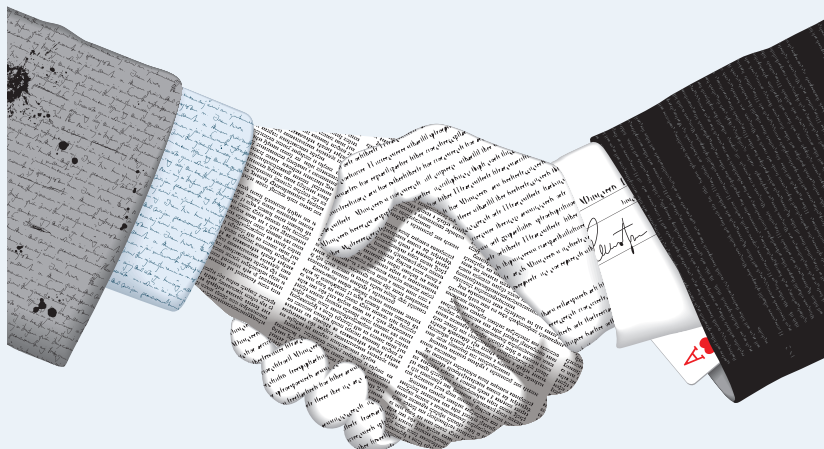
Curiosity. I think inquisitiveness is a big one, and somebody who listens to what you're saying. Also, somebody who's willing to say "I don't know."

**Is there one book you would recommend every graduate student read?**

Everyone should read Thomas Kuhn's *The Structure of Scientific Revolutions*. This is a classic book. We always think of science as the scientific method, and he shows how you try to explain more and more of the variance. What are the revolutions in our knowledge? What that book does is it gives you insight into how science works in a nonlinear way.

**What advice would you give a graduate student upon their departure from your program? After they get their diploma, you say, "Wait, I want to tell you one more thing."**

[Laughs.] That's a good question. I would say paying forward is a good thing. You get something and you give it back.



### Do you have them read *On the Origin of Species*?

No, but they read passages in it. I found that book to be amazing. Darwin had figured out so many of these things. It just blows my mind, the insight he had.

In Darwin's sixth edition, the one he intended for posterity, he actually acknowledges a Creator with a capital C. "There is grandeur in this view of life, with its several powers, having been originally breathed by the Creator into a few forms or into one; and that, whilst this planet has gone circling on according to the fixed law of gravity, from so simple a beginning endless forms most beautiful and most wonderful have been, and are being evolved."

I specifically use that paragraph in the course. Both for the humanities side, the poetry of his writing, as well as what it means. That's an important perspective that there was a Creator, and that it started with one or more forms, which is very interesting. Even today, researchers speculate on what came before the Big Bang. So I do use that in class and I go through it piece by piece. Think about what's in there—and he does talk about evolution continuing to happen today. It opens up the discussion to examine recent findings about ongoing human evolution and eugenics.

### What has been your greatest pleasure as an entomologist?

I think good groups where everybody has a common goal and each of their efforts adds to the final product. Like the "Bt crops team" of George Kennedy, John Van Duyn, J. R. Bradley, and me. The combination of entomological knowledge, genetic theory, and extension experience were essential to our success. My career would never have advanced without the expertise and collegiality of these faculty members. That's really fulfilling. And I love doing field work, and—oh! They're going to pay me for doing this! [Laughs.] George and I have published a lot of papers together. That was a happy time. I feel very fortunate. I've had great colleagues.

### What do you hope will be your legacy?

[Laughs.] You ask that to everybody, and everybody says, "What the hell do you mean? Legacy!"

Then what do you hope will be the effect of your life that carries into the next generation of scientists?

▼  
"IT'S CALLED,  
IN HEBREW,  
TIKKUN OLAM—  
BASICALLY,  
'HELPING THE  
WORLD BE  
BETTER.'"

Well, in the end, it won't matter, right? You're dead. Maybe somebody is going to remember you for twenty years, but at some point, they have to forget you. What do I want to leave? I hope to leave students that have a good chance to flourish and fulfill their ability. Legacy is kind of a funny word. There is a thing in the Jewish religion—it's called, in Hebrew, *tikkun olam*—basically, "helping the world be better." I think all of my colleagues strive for that.

### So how is your Hebrew?

[Laughs.] Not very good anymore.

### Was Hebrew spoken at home?

No, it was spoken in the yeshiva. I went to a Hebrew school. I was not a very good student. I almost got left back after the third grade. [But] one of the best compliments I got from a student was, "Fred, you do science left-handed. You look at things differently." I think everybody has a different brain. Give your brain credit to go where it wants to go. Don't worry if it fits into this academic thing. Be curious. When we have a meeting with eight people, their brains are different, their experiences are different. And it's that conglomeration of those things that gives you something. It's the fun of the process.

### You're still having fun, aren't you?

I feel really *blessed* to be able to do what I'm doing now.

And you've also been honored. In the book *Lords of the Harvest: Biotech, Big Money, and the Future of Food*, the author states that Monsanto commissioned an investiga-

tion into your background, and the investigators reported that you were politically suspect since you "supported socialist agricultural policies." I guess that's quite an "honor" to be investigated by Monsanto.

[Laughs.] Somebody shared the report. I thought it was funny. It was socialistic policies, right? We were going to tell farmers what to do, so I guess that's socialistic.

One of the other honors is that you've been elected to the National Academy of Sciences.

Election in the National Academy is a pretty arcane thing. I've talked to other people in the Academy, and the feeling is: how did we get in here? When you're outside, looking at the people on the inside—well, they must be super-human beings. Then you get in there and think, "Well, if I'm in here, what is this?" [Laughs.] But it's been very helpful to me. Because the outside perspective on somebody being in the National Academy is that you've accomplished great things, and that you're this leader, so it has helped. Chairing the report on engineered crops was a big deal for me. I don't know if I would have been selected to chair it if I wasn't in the Academy. The process used by the committee to develop the report was novel in the Academy, and we weren't exactly loved by everybody when we started out, but we were determined to take as balanced of a perspective as we could, and to listen carefully to the critics. I'm not sure I deserve to be in the National Academy, but I hope I've used it well both at the Academy and back at NC State, and it gives me more clout at NC State.

### Did it get you a special parking spot on campus?

[Laughs.] I ought to ask for that. Most of the time, I just ride my bicycle.

### Acknowledgments

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