

Born

3 March 1952
Chicago, Illinois

Current Position

Distinguished Professor
Emeritus of Entomology and
Recall Professor
University of California-Davis

**Refereed Publications and
Book Chapters**

375

**Extension, Proceedings, and
Trade Journal Publications**

>400

Highly Cited Publication

Drosophila suzukii: Invasive Pest
of Ripening Soft Fruit...
(with 8 co-authors)
935 citations

Mentoring

14 Ph.D. students
7 M.S. students

Service

ESA President
ESA Pacific Branch President
ESA Science Policy Committee
Editor-in-Chief, *Journal of
Economic Entomology*, (2018–
2022)
President, Entomological
Foundation

Honors

Fellow, American Association for
the Advancement of Science
Fellow, Entomological Society
of America
Fellow, Royal Entomological
Society (London)
Fellow, California Academy of
Sciences
Honorary Member, Entomological
Society of America
ESA Achievement Award
in Extension
ESA Recognition Award
Entomological Foundation
IPM Team Award
Entomological Foundation
Excellence in IPM Award
C. W. Woodward Award, ESA
Pacific Branch
Fulbright Senior Research
Scholarship



Spotted-wing
drosophila. (Photo by
Thomas V. Myers.)

Frank Zalom: Blue Collar California

Marlin E. Rice

When Frank Zalom learned from a friend that he could study for a doctorate degree and earn a stipend that exceeded his salary as a high school teacher, he eagerly applied to marine biology programs at four California universities. After visiting UC-Davis, his third stop on a campus tour, he became discouraged after being repeatedly told that the job market for marine biologists was perpetually bleak. Seeking solace, he sauntered into an adjacent building that housed the Department of Entomology,

and there his life was changed forever. Currently a distinguished professor emeritus of entomology at the University of California-Davis, Zalom would eventually gain national recognition as the Director of the University of California Statewide Integrated Pest Management (UCIPM) program—a position he held from 1986 to 2002.

Zalom earned B.S. (1974, Zoology) and M.S. (1975, Ecology) degrees from Arizona State University, and a Ph.D. (1978, Entomology) from the University of

California–Davis. After a brief six-month postdoc at UC–Berkeley studying mosquito genetics, he joined the faculty at the University of Minnesota in 1979.

A year later, Zalom returned to his alma mater and accepted a position as Extension IPM Coordinator–University of California Cooperative Extension in the newly established UCIPM program. Beginning in 1980 and continuing through today, Zalom has focused his extension and research activities on California specialty crops, including tree crops, small fruits, and fruiting vegetables. The IPM strategies and tactics Zalom has developed include monitoring procedures, thresholds, pest development and population models, biological control, cultural control, and use of less toxic pesticides, which have become standard practice and part of the University of California IPM guidelines for these crops.

The Zalom lab has responded to numerous newly identified or invasive pests in the last two decades, with research projects on glassy-winged sharpshooter, olive fruit fly, a new biotype of greenhouse whitefly, light brown apple moth, grapevine red blotch disease, brown marmorated stink bug, and spotted-wing drosophila, among others. Currently, Zalom is continuing his research at UC–Davis, which includes an advisory role with the California Department of Food and Agriculture’s Office of Pesticide Consultation and Analysis.

Widely recognized for his leadership skills, Zalom’s roles have included the Experiment Station Committee on Organization and Policy (ESCOPE) Co-Chair of the National IPM Committee, the ESCOP Science and Technology Committee, and manager for the USDA-CSREES Western Region IPM Competitive Grants program. He helped organize the 1st, 2nd, and 4th National IPM Symposia, and was co-investigator on the USDA grant that originally funded the Western IPM Center. He is also known for many international IPM and agricultural development activities.

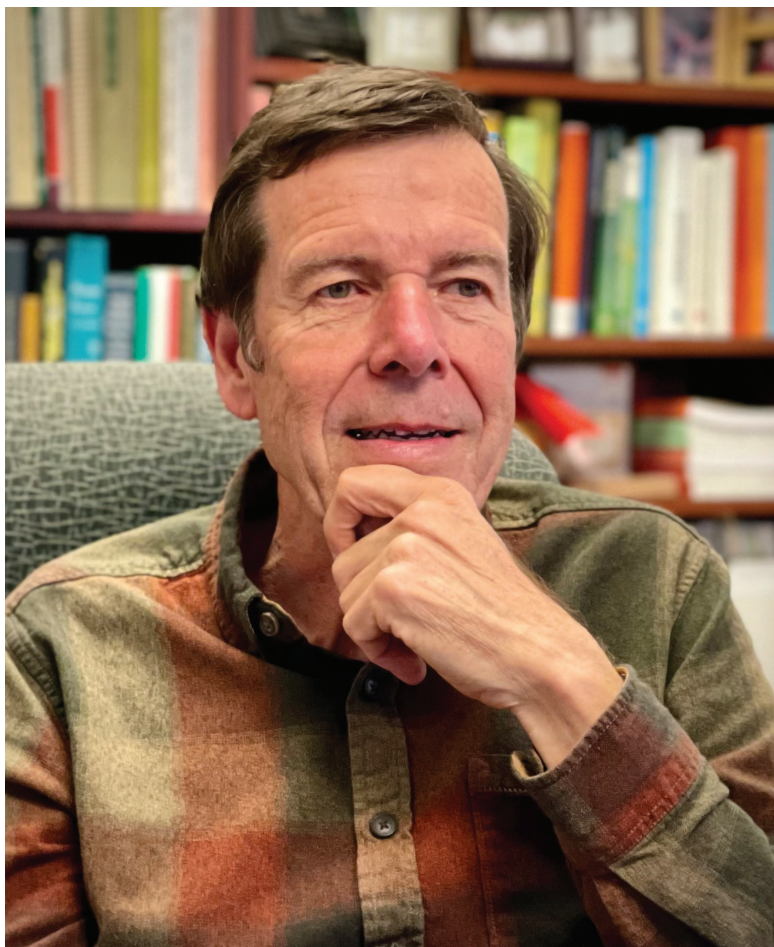
In addition to his many honors, Zalom was awarded the B. Y. Morrison Memorial Lecture and Medal by USDA-ARS and the American Society for Horticultural Science for his research contributions to horticultural crops. He is the only entomologist to have received this award. At UC–Davis,

he was presented with the James H. Meyer Award for excellence in teaching, research, and service, and the Outstanding Mentor Award from the UC–Davis Consortium for Women and Research.

Zalom, age 70, was interviewed 14 February 2023 in Davis, California. The interview is edited for length and clarity.

What was your first memorable experience with an insect?

I was raised in Arizona, and it may have been when I was six or seven years old. We had very sandy soils, and we’d see cone-shaped pits with an antlion in the bottom. We’d drop other insects in there for them to grab. That was the first time I ever thought much about insects.



Frank Zalom, Distinguished Professor Emeritus of Entomology and Recall Professor, University of California–Davis, 2023. (Photo by Marlin E. Rice.)

Tell me about your parents. What did they do, and did they encourage your interest in nature?

No. My parents were immigrants from Czechoslovakia, and they met in Chicago. I’m not sure that my mother even graduated from the eighth grade. My father earned his GED through night school and took business classes. Both parents worked for Western Electric, which was part of AT&T. The company manufactured cables for telephones in Chicago, then they moved to Phoenix. My father wanted me to get a college degree and work for the telephone company. That’s what they thought you needed to get ahead. That’s why I went to Arizona State University.

What did you study at Arizona State?

My first major was architecture. In high school, I really liked mechanical drawing, and I was pretty good with math. In 1970, there was the first Earth Day, and I got caught up in that. I wanted to do something to save the world from pollution and overpopulation. I was really interested in environmental issues. That's when I switched to zoology. At Arizona State, we collected scorpions for their anti-venom lab, and they would pay us a quarter a scorpion.

Did you use blacklights to find the scorpions?

We did. And we would find newspapers, get them wet, and put them down on the ground. The scorpions would crawl under them. So you could blacklight, because they are mostly nocturnal and fluoresce, or find them under the wet newspapers in the morning. And we would collect rattlesnakes at night too, and tarantulas and black widows. I made a little money out of that at a quarter apiece. Kinda weird. We had three or four people and could get fifty scorpions in an evening.

Did you ever get stung?

I never got stung.

That's an interesting way to subsidize your education, by collecting scorpions.

Things were really cheap at that time. Tuition was like \$160 a semester.

Entomology eventually grabbed you. How did that happen?

In those days, there were a lot of required "-ology" type classes. I took general entomology, taught by Frank Hasbrouck. I did well in the class and thought it was interesting. Another class I took was aquatic insects; that was taught from an ecology perspective. I liked working with insects, but I never imagined I would do anything related to entomology when I finished. I also did a summer job at the USDA cotton lab in Phoenix, working with their sterile male release program and sweeping cotton fields for pink bollworms. I did it for a job, but I learned more about research.

You received a master's degree at Arizona State, and five of your first papers were regarding Notonectidae—the backswimmers. What was the attraction to these water bugs?

My major professor, John Alcock, had just started there. He came in from Harvard and was an interesting and charismatic guy. I was one of his very first students. My interests were in aquatic ecology at that point, and I really enjoyed the work. I was doing a master's degree because I was teaching math in high school, and it's advantageous to have a master's if you're teaching school. I didn't anticipate pursuing another degree. I had a friend at ASU working on a fisheries degree and learned that he was getting paid while getting a Ph.D.

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"IT OPENED
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BEFORE."

You realized you could get paid to go to graduate school.

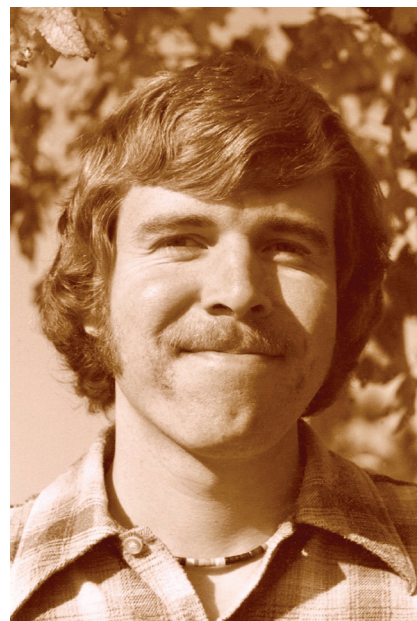
I was teaching high school and making \$6,500 a year, and he was making about the same while doing his dissertation research.

Was a graduate stipend paying more than teaching high school?

Yeah! And getting his graduate education paid as well. I thought maybe I ought to do something like this, because I wasn't married at the time, and I had no other obligations, so there was nothing lost. I applied to marine biology programs, mostly to study intertidal invertebrates.

Was marine biology sort of a connection to aquatic insects?

Yeah, but working with crustaceans. This is when I got serious about entomology. I was accepted into several marine



Frank Zalom, graduate student at University of California–Davis, 1977.

biology graduate programs on the West Coast: Southern Cal, UC–Santa Barbara, UC–Berkeley, and UC–Davis. I used the spring break from teaching to tour these campuses and talk to the people who would become my major professor. I first went to Southern Cal. They have a marine lab on Santa Catalina Island. I said, "What about the job situation in marine biology?" The guy who would have been my major professor said, "Ah, there's hardly any jobs. There may be a hundred people applying for every marine biology job." Well, that didn't sound promising! I'm good, but not that good. So I went to UC–Santa Barbara, and they were really nice, but not encouraging on the job part either. Then I came to UC–Davis. I knew they had an entomology department, so I walked over and talked to their aquatic entomologist. I said, "What can you do with an entomology degree?" He said, "You can work in industry, you can get USDA jobs. There are all kinds of jobs in entomology." I thought, "I'm going to be an entomologist." And that guy became my major professor.

Who was your major advisor?

Albert Grigarick. One of his students, Steve Clement, was about to graduate, and Al said he could take me as a new student. I switched my application to entomology

and ended up at UC–Davis, doing my dissertation in rice entomology. Clement used to say that working in rice was “hot, humid, and horrible.” [Laughs.] You’d be bitten by everything that bites. But it was a fun time, and I worked on a community ecology study. I started learning about agriculture at that time and interacting with growers and rice breeders. It opened a different world to me I’d never seen before.

What was your greatest challenge as an undergraduate or graduate student?

Just to figure out where I would be going with a career. I always had this “working for the telephone company” mentality, which I did not want to do. If you don’t come from an academic background, you only associate professional jobs with doctors, lawyers, teachers, and teaching was something I knew I could do. As I started to mature academically, I realized there’s a whole world out there I wasn’t aware of. More things than being a doctor, lawyer, or teacher.

What came after you gained your Ph.D.?

I did a postdoc at UC–Berkeley on mosquito genetics. [Laughs.] I was in a lab that used genetic markers: eye color, wing spots that could be linked to other traits. At that time, they were attempting to do sterile releases of male mosquitoes. We were looking at potential genetic control traits linked to phenological markers. We’d irradiate the mosquitoes, select these weird mutants and lines with the traits we wanted. Then I got offered the job at University of Minnesota only three weeks after I had started my postdoc, but I had promised I would stay six months. Minnesota waited for me, but then I had to walk right in and start teaching two entomology classes.

Do you remember your starting salary?

I remember that really well! \$14,700.

You remember the starting salary because it was good or not so good?

Well, it seemed great to me. But they started hiring other faculty members right after me, and the next person got paid \$2,000 dollars more than me. And it was a graduate student from Davis. I thought, “This isn’t fair!” I talked to the department head and he said, “We try to create inequity in salaries so we can justify increasing other people’s salaries later.” When I mentioned this to other faculty they said,

“We’ve heard that for years, and it really doesn’t work that way.”

You were at University of Minnesota for a little more than a year and then said, “I’m out of here.”

It wasn’t quite like that, but it was an opportunity to come back to California at the start of the new UCIPM program. I felt that if IPM was going to become widely used in practice that California would be the place it could happen. They also offered me \$16,800 at Davis. [Laughs.]



“I’VE ALWAYS TRIED TO REDUCE THE NEGATIVE IMPACTS OF PESTICIDES...”

You’ve had a long career in entomology.

Did you ever wish you’d pursued another path?

No. In hindsight, everything turned out just great. I was so lucky. However, I did have doubts about returning to California. The faculty in Minnesota were telling me I was crazy because I was going into a non-tenured position. The UCIPM program had just started, and it was funded by the state legislature. Initially we had to request funding for the program every year.

Did you think you were crazy for coming back to California?

I was excited about the type of work we were doing, but I soon realized that IPM was not mainstream. One of the first talks I gave was to a large group of California

pest control advisers. It was 1980. I was invited to introduce the UCIPM program to the advisers. Everyone was cordial, but you could tell the topic was not enthusiastically received. The guy who spoke after me ran the toxic waste dump at Kettleman City. He got up and said, “Well, you know, our trucks are going to run right over IPM.” And everybody started laughing. I thought, “Wow, maybe this isn’t the smartest thing I’ve ever done!” [Laughs.] There was a lot of tension between the mainstream ag groups and the people promoting IPM in those days. It was a little scary.

Did you ever get into a tenure-track position?

Yeah. I traveled a very circuitous route, though. In California, extension academics don’t receive tenure; they do get security of employment. The way it was explained to me when I was hired—“Don’t worry, if the IPM funds go away, we’ll transfer you to another position with security of employment.”

Did you get that security in writing?

No. I’m very trusting in general, and I didn’t know any better. But we never crossed that bridge because the UCIPM program eventually became part of the regular university budget, so it was institutionalized. Over time, my appointment was split between extension and the experiment station. Later, I received a formal teaching appointment that resulted in tenure. So I have a three-way split: extension, research, and teaching, which is practically unheard of in California.

You are officially retired but still working as a recall professor. When I hear the word “recall,” I think of something that is broken or not functioning correctly, like an automotive part. I assume that’s not what recall means here?

No, although there are days when I feel like I am not quite functioning properly. At UC, you can get recalled and paid part-time, and in my case, it allows me to keep my lab and most importantly to stay active in research. The funding comes from the California Department of Food and Agriculture primarily for consulting on pesticide uses, alternatives, and impacts of proposed regulations. This is helpful for the state because I have a solid understanding of pests and pest management in

California crops, and I have established a good deal of mutual trust and understanding with growers' groups. In this role, I can impact pesticide policy and help maintain some of the most critical chemical uses.

Then the Recall Professor is really about the university retaining talent?

That's right. It's a neat thing.

What is your philosophy of extension?

It's about putting your foot in the other person's shoes. I try to understand the grower's perspective and needs, then approach the job like problem solving. Although I've always tried to reduce the negative impacts of pesticides, I also work towards implementable alternatives. The growers appreciate it. They know I'm not trying to take the pesticides from them without offering an alternative. That was a concern from the ag industry early in the UCIPM program, which was funded by the state legislature to reduce pesticide use, and the growers were worried that it would contribute to more regulation.

You've made several seminal contributions to entomology. Is there one that you consider a crowning achievement?

Playing a role in getting the UCIPM program recognized as an integral part of the university system and gaining its acceptance by growers. But I didn't do this by myself, of course. We had a team of very talented people who were passionate about IPM and worked well together. I was fortunate to help facilitate it and keep the momentum going.

You studied numerous insects. What's a favorite and why?

The spotted-wing drosophila is my favorite. There's just so much that can be done with it. It's easy to rear, has a short generation time, and an economic problem. And it's a *Drosophila* after all, so it brought me back to population genetics, which I enjoyed many years ago. Working with geneticist Joanna Chiu has enabled me to learn about molecular techniques. She's great to work with and is patient with an old guy like me.

Did you ever think that the spotted-wing drosophila was going to totally devastate a crop?



Frank Zalom, University of California extension entomologist, in a strawberry field, 2015. (Photo by Ed Show.)

I never thought it would eliminate any crop. I've worked with a lot of invasive species over the years, and every one was purported to be the "end of agriculture" in California. But growers and researchers always figure out how to deal with them and still produce crops. Ours was the first academic lab that worked with spotted-wing drosophila, and that came from my extension entomology side. One of the extension farm advisors in the Monterey Bay area called and said, "We've got this

Drosophila on our strawberries and it's really doing a number on them." I said, "I've worked with *Drosophila* on strawberries before and don't worry about it. Just harvest more frequently, and don't let the berries get overripe." He got ahold of me in two to three weeks and said, "These things are different than any *Drosophila* I've ever seen or sprayed. We can't kill them." I went and looked at it. We were in the middle of the light brown apple moth quarantine at the time, which was another invasive

species. The farm advisor said, “We can’t have another invasive [pest] because we’re going to get quarantined again.” Well, ethically, we’ve got to report this. I’d never seen anything like it either. I sent it to the state diagnostic lab and they wrote back, “It’s a *Drosophila*. Don’t worry about it.” [Laughs.]

The state laboratory said exactly the same thing.

Exactly. It’s kind of ironic. The next spring, there was a 30 percent crop loss on cherries, which is huge. Then the state figured out it was *Drosophila suzukii*. They started trapping and found it from San Diego to the Oregon border, and determined there was nothing that could be done. [Laughs.] We didn’t know what to do, but we kept working on it. We held a meeting in Davis with people from Oregon and Washington, where it was also being found, and then wrote a USDA-SCRI research grant that got funded.

There are dozens of invasive pests in California. Do you think there’s some country creating eco-terrorism on California agriculture?

That’s a really good question. I’m not a conspiracy theorist, but we have the biggest ports in the country in Los Angeles and Long Beach. There’s constant trade between countries, especially on the Pacific Rim. I think they just slip by surveillance efforts and get established on the diversity

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of plants we have in California. With more trade will come more invasive species. There’s not much we can do to stop it.

You’ve traveled the world. Have you had any unusual experiences?

I was in Tajikistan and leaving the country. At the airport, they looked at my passport, pulled me aside, and sat me in a chair. There was a Tajik guy coming through customs that I had met just the day before at a meeting. I waved at him, and he asked, “What’s going on?” I said, “I don’t know.” Nobody spoke English. So he talked to them, and supposedly my visa had expired. What they were trying to tell me is I would have to go to the embassy and get my visa extended. That would have meant another three or four days before I could leave. He said, “I think they’re trying to shake you down for money. Do you have any cash?” I said, “I’ve got a hundred dollars.” He went and talked to one guy, then another guy wearing an old Soviet-style military hat stamped my passport and left. My Tajik friend said, “Now wait fifteen minutes and then go to the bathroom with your hundred dollars.” Sure enough, I go to the bathroom and the guy with the big Soviet hat is there. I hand him the money and that was it. That was a weird experience. [Laughs.]

Was the weird part paying the hundred bucks or meeting him in the bathroom?

The really weird part is he wanted me to go to the urinal. He’s at the next urinal and I hand him the money while we’re standing there. [Laughs.]

As an extension entomologist, what do you see as the future for extension?

[Long pause.] That’s a hard question. I think extension is tremendously important and it is one of the things that has made the land-grant university system unique in the world. Five years ago, I might have said, “The future’s bleak in California.” And if California’s budget problems got really bad, I’m not sure that it would survive. The campus and county links were becoming increasingly strained as retirements were greatly reducing the numbers of specialists and farm advisors, and the ability to respond to problems locally became increasingly difficult. The traditional extension model didn’t reflect the current way information is being transferred, either. In California, there



HTRNR/ADOBE STOCK

are well-established crop consultants that advise growers and large farming operations with their own crop and pest management staff. Recently, budgets have increased in extension and people are being hired again. But many new positions reflect working on more thematic problems like fire and climate. Roles have shifted for extension, with farm advisors and specialists assuming more of the transitional experiment station applied research role. California extension is in transition.

Do you think the future is bright, but just different?

I think it is bright, because there remains a need for university-based applied research programs. The traditional extension programs where you'd regularly meet with growers—there's going to be a different model for that. More electronic transfer of information, more electronic meetings, but it loses something.

Certainly you miss the personal interaction with clientele.

You don't have pest control advisers come up to you after you've done three talks on tomatoes that say, "That's the third time I've heard you do that talk and you're getting better every time." [Laughs.] But if it's not in person, you lose that type of personal connection.

Part of being a successful extension entomologist is establishing personal relationships.

Absolutely. That's one reason why I'm able to do the work with the state right now. I know many people in California's ag industry and have earned a level of trust. And to develop that trust is to be effective in helping them to change. Highways 5 and 99 are two big roads up and down the Central Valley, and I can get off at any exit and be within ten miles of somebody I know or have worked with. [Laughs.]

What great question in agricultural entomology or agricultural policy would you like to see addressed before you call it quits?

The biggest challenge is invasive species. Accepting that they will get established and how will you manage them from a practical and policy standpoint. They're probably not going to be eradicated, so less emphasis on eradication and more



Frank Zalom (right) and Ron Vargas are recognized by *California Farmer* magazine in 2001 for their extension work benefiting California agriculture.

on management. And dealing with trade issues, which are deeply political. How do we manage invaders on a world scale to keep them out of the chain of trade? I would like to see policymakers address that at some point. But right now, it's a losing battle.

Any other questions to address?

Another is the potential for using pesticides on a prescription basis. If an insecticide presents a human health or environmental hazard, maybe somebody should be trained and licensed to prescribe its use safely under less risky circumstances. That's a policy to consider instead of eliminating the ability to use pesticides that have value. Ultimately, too many materials are lost because the ag industry fights use restrictions right to the end. Maybe proposing prescription use is some way of maintaining useful products.

You were president of the Entomological Society of America. Did you ever envision that you would attain that honor at the beginning of your career?

Never. I still don't know exactly how that happened. [Laughs.] That was the greatest thrill of my life. I tried not to screw anything up for the Society, but it provides the opportunity to do some things that you believe are important for the discipline.

As president, you issued some Grand Challenges. Do you feel like those gained any traction?

They got people talking about important issues that the entomological community can address, so in that respect, I think it did. It also helped ESA's global initiative by partnering with other international societies, particularly with the Entomological Society of Brazil. I noticed the Royal Entomological Society has established a Grand Challenges initiative to identify how to improve the human condition.

You're organizing a dinner party. Which three people do you invite and why?

[Long pause.] Charles Darwin would be interesting and how his observations led to his theory of natural selection. Teddy Roosevelt, because of his appreciation of nature and outdoor experiences. Maybe Lech Wałęsa, because I appreciate our freedoms and his fight for freedom from tyranny. So the dinner discussion could involve a combination of evolution, natural history, and freedom.

Do you have any regrets? Things you wish you'd done differently.

Professionally, I can't think of anything major. There were things I could have done better, but I've been lucky and had just a great run. [Laughs.]

What do you think about at the end of the day?

I'm interested in what my family is doing. Family comes first in my life, then work. I still bring a lot of entomology-related work home with me. Honestly, it's pretty bad. [Laughs.] But entomology has just been a great career for me. I may have gotten a job in marine biology, but I wouldn't have been any happier.

Acknowledgments

Thanks to Hannah Burrack, Joanna Chiu, Kelly Hamby, and Doug Walsh for insights into the life and career of Frank Zalom.

Marlin E. Rice is a Fellow, Honorary Member, and past president of the Entomological Society of America.

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ADVICE FROM A LEGEND

What attributes or characteristics do you look for in a graduate student?

Somebody that knows why they want to go to graduate school, and then why they want to work with me. I'm trying to find somebody that is okay with being a blue-collar entomologist, because that's the way I consider myself: somebody that doesn't mind getting dirty, who's interested in insects, likes to communicate with people, and wants to solve problems.

What book would you recommend graduate students read?

A good one is *Life on a Little-Known Planet* [by Howard Ensign Evans]. It tells why insects are important and the research that led to important discoveries. If you're not interested in that sort of thing, then maybe you shouldn't be studying entomology or pursuing it as a career.

How important are soft skills like critical thinking and creativity to a student's preparation for a career in extension?

Soft skills are more important than being smart. [Laughs.] Obviously, they must ask good questions and have the ability to do research, but soft skills are critical. I can talk to someone and tell whether they are a fit for my lab or not, and it's mostly by simply letting them talk about their interests. It exposes their personality.

A student asks you about a vocation as an extension entomologist. Considering today's academic climate, do you encourage or dissuade them?

I would encourage them to work in agricultural entomology or applied research, and to learn to interact with growers. With the right skill set, you can get industry or private consulting jobs as well as extension. I had two students that left tenured positions and [went] into industry. They found that they can do more in industry than in extension because there's less emphasis on paperwork, and applying for grants and publishing, which aren't as much fun as working with stakeholders and as part of a team.

What final advice do you provide when a student graduates from your lab?

Don't get discouraged. Things will get better as you get farther along in your career. Graduate students think they have it bad—they don't realize how good they have it. But if your first job is on a faculty, you're going to have to deal with paperwork and get grants and network more. I try to get students networking, and that's why it's important to go to ESA meetings. And it's going to be a lot of work, but then it gets better. You get established. The best part is when you get close to retiring and you don't have to do the mundane stuff anymore. You can do what you really want to do.

