The Don Difference Series
Punya Nachappa

0:00-0:30 I am an entomologist, which means I study insects. Specifically insects that transmit diseases and pathogens that cause diseases in plants. I study these little, tiny insects called soybean aphids and soybean thrips that transmit diseases to soybean plants here in Indiana. I study the ecological consequences and molecular mechanisms underlying how plants, pathogens, and insects interact.

0:31-0:57 What I mean by that is, when I say ecological consequences, what are the outcomes of these interactions? How do these plant pathogens affect the insect behavior, the fecundity, and fitness. And how does the plant get affected? And at the molecular level, we look at genes and proteins that, you know, shape these interactions. So I use a lot of gene expression analysis and transcriptomic analysis to understand these interactions.

0:58-1:17 The other thing that I added on to this picture of understanding the interactions between plants, pathogens, and insects is the environment. Things like plant change, drought stress, and high temperature, which is more and more prevalent now in the world and here on Earth. How do these abiotic factors, how do they affect these interactions?

1:18-1:58 Of course, traditionally pesticides have been used to combat these pests and diseases, but as we all know, insects develop resistance and just using pesticides is not good enough, so you need to have a better idea at the molecular level to understand how the genes in the plants and the insects, how they're being affected as the insect feeds on the plant and when the plants responds against the insect and try to target it at that level, at the molecular level, so we can come up with more innovative strategies to, you know, combat these pests and diseases.

1:59-2:25 So that's one approach. Of course, one of the diseases that I'm studying in my lab is a brand-new soybean viral disease that did not exist six years ago. And all of a sudden, it's devastating the soybean crop widespread in almost all the north-central Midwestern states here, and even in Indiana. So you need scientists to stay on top of things and do the research and get the knowledge to the growers so they can implement these control strategies.

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2:26-2:35 If you didn't have scientists working on these issues, there's no way growers are going to know about it because they're too busy carrying on just the maintenance of the farm.

2:36-2:59 A lot of my research is funded by the Indiana Soybean Alliance. As part of this program, I get to interact with a lot of soybean growers, give a lot of talks here in the northeastern soybean growers' alliance. Having this regional support has helped me gain leverage at the national level in getting USDA grants because federal funding is hard to come by.

3:00-3:27 I mean it's incredible the amount of great research that's going on here where students can get involved. And it's small enough that students just walk up to me and are like, 'Dr. Nachappa, I really got interested in what you said in class today and your research. Could I come in and do a research experiment or a research experience in your lab?' I feel like, you know, they can really reach for the stars right here at IPFW.

3:28-3:31 (Music)