



Make Your Story
Purdue Libraries and School of Information Studies

Season 2, Episode 2: Students and Soybeans, Sprouting Sustainable Innovations

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AB: Hello and welcome to another episode of Purdue University's MakeYourStory podcast, celebrating student stories of making and creating new and exciting projects and innovations all over campus. My name is Dr. Annette Bochenek. I work as an assistant professor and business information specialist at Purdue and I am your host for today's podcast episode. As a librarian, I frequently see Purdue's Library and Information resources aiding in the research process that prefaces so many of these projects of making and creating.

Today, our story of making is quite literally home-grown, stemming from one small but versatile source of inspiration: the soybean. While this little species of legume is widely grown to be eaten, it has numerous uses beyond being a food source. In fact, the soybean has so many uses that it is at the heart of one of Purdue's most anticipated case competitions: the soybean innovation competition.

In this episode, we'll delve into the Soybean Competition and also speak to some past award recipients as well as discuss the ups and downs of the innovation process.

First, we'll hear from Micky Creech, the manager of Purdue's Student Soybean Innovation Competition Program and learn more about the competition itself.

MC: Well, this is actually the 28th year of it, so it's been going on at the Purdue campus for quite some time, actually. Soy crayons, soy markers and soy candles were actually developed in the beginning of this competition by Purdue alumni. And those are products that most everybody will readily identify with and know that they're on the market; everybody uses them and sees them. So, those actually came from alumni from the Purdue University. So, what it is, it's actually a grant from Indiana Soybean Alliance (ISA), where they get money from the soybean sales of farmers, and they use those funds to promote additional sales or new ideas for soybean usage. So, one of the things that they sponsor is the soy competition. So that's how it came to be. And now like I said, we're in our 28th year of the competition and it's interesting because every year, you know, it has to be a novel idea for the students. So it has to be something new that's not currently on the market or hasn't been done before in the soy competition within 28 years. There's been a lot of things attempted in the soy competition, but it's amazing—every year Purdue students come up with new ideas and they work, and many of them are in consideration for commercialization on down the road. It just takes a long time to get a product from an idea to actually on the shelves. But the really neat products that come up—they just blow me away sometimes with these products ideas and then making them work because it's not just a concept. They actually have to have a working prototype by the end of the competition.

AB: So, how would you say, then, that information sources help complement this innovation process?

MC: Well, there's really only four stages to the competition, so it's probably not quite as daunting as what you think when you think, “Oh my gosh, I’ve got to come up a business plan in a product. It has to be soy-based, and how do I do all that?” You know? But we have phases throughout the competition--there's only four—and it's through each stage that we help you. So, the beginning stage is just pretty much full photo releases and signing documents and you know, just the basic information saying, yeah, you want to be in the competition and you realize that your product, you know, your product idea is going to be equally owned between ISA and Purdue and et cetera and stuff like that. And then photo releases, because I use photos of students and stuff for the next year. And then also at the end of the competition, we push out a lot of PR and we use photos and stuff like that.

So, really the first part of the competition is just basic documentation. The phase two of the competition is where teams are actually come up with the product ideas and start moving forward with them. So, one of the first things that they have to do is ensure that the product has to be novel. So, I always tease and tell them, “Go to Dr. Google and look it up and make sure that you can't find it out there. That's your first place.” But then secondly, we use the libraries and yourself as ways they have to be able to get a patent on it. So, Dave Zwicky helps with that. And, then the market analysis and literature review—of course you and Heather [Howard] help with help these teams. And many times they already think that they have a market and when they come to you they have missed a market and you guys are able to show that to them. And you also give them accesses to other databases and things like that that they don't normally have. So that helps make sure that they are starting with a solid foundation at

the beginning of the competition. Meaning, is your product novel? Yes. Can you get a patent on it? Yes. Is there a market out there? Will somebody buy it? Yes. Because many times I tell students, even though you can make a product, should you make a product, is there going to be a market out there? Is anybody going to buy it? Because it doesn't do you any good? If there's no market, no one's going to buy it. If it's even a great product, it doesn't, you know, if you don't have a market out there, you're not going to go anywhere. And then the other thing that they need to figure out is, again, who sponsors the competition? ISA soybean farmers, what do they want to do? They want to sell more soybeans. So, in your product, is it going to use a large amount of soybeans? And if so, tell us—calculate how much you know. Is it going to be by the tons? It's going to be the semi loads, you know, how much soy are you actually selling? How much are you actually going to generate with your product? Now, sometimes they don't know that until they go along. And then the other thing that's most important that I always tell them to do is you need to answer the question by using soy. How does it significantly make this product better? Because if you can substitute corn another starch, anything else from it, then it's not just soy. But if you can answer the question, why by using soy is this significantly better than what's currently on the market? You'll do very well in the competition

AB: With seeing all these different students execute their ideas—and I'm sure you've witnessed many successes, challenges, and pitfalls that have come up—do you have any memorable moments tied to the competition that you'd like to share?

MC: Well, gosh, I guess for me, these students, you know, I work with them all year from September, you know, getting to know them until March when the soy competition is. They usually make fun of me at judging because they're all my students and I want all of them to win. So, I'm real careful about, you know, not trying to say anything. ISA does a really good job of bringing in judges that don't have any ties to Purdue. So, when the students pitch, they don't really have, you know, it's not a Purdue person, it's not somebody that they worked with. It's a brand new, you know, team of judges, shall we say. So, I guess I enjoy seeing them develop from knowing really nothing to actually having a product at the end and being able to sell it almost like a salesperson.

Because, while a lot of people think that this is a lot of engineering and a technical competition. It really is, I would say it's more entrepreneurship because when you come down the judging at the end, it's judged a third on your business plan, a third on your prototype (Does it work? Does it do what you say it's going to do?), and a third on the presentation that they give to the judges. Think of it like Shark Tank; they have 10 minutes to do a PowerPoint presentation to present to the judges and kind of blow them away. And really, it's just, to me it's like Shark Tank and I'm telling students that you're pitching for this five, 10, or \$20,000 to these judges. So, you, you have to sell yourself and your product to them and sell it as the best product that they're going to see today. And why—well, put your pieces again together because it's novel. It can get to commercialization. You have a big market out there. You're going to sell a lot of soy beans and your product works and it significantly makes the end product better. If you answer those questions, you'll do well in competition. So, I think what I like best is seeing them grow from the point of not being able to do anything to at the end. They do a really good job of that.

And, and you can see that that growth in them and sometimes when they meet challenges, overcoming them challenges, they really learn a lot from that. And then I get to know them on a personal basis because they're like all my kids then. So, I want them all to do well.

AB: Wonderful. So, with that being said, then, why should students consider participating in the soybean competition?

MC: Well, I kind of like when I said one of the reasons is there's like no degree area that won't work because everybody can contribute to this. Some products that we get are very technical and it, and you do, they do end up in the lab a lot of times. Some products are very simple. Like one year we had a product that had three simple ingredients. It was a boot polish. The team did really well. They, they finished second that the year they did a great job, our job with marketing and things like that. And that product actually got sold to a company in Indiana. So, it was about two years later, you know, the students have left Purdue, but they were still getting money from the competition and a return on their investment from that competition for that year.

That doesn't always happen, but in that case it did. It was just three simple ingredients. So, while again, some students will think that it's really technical, you have to have a lot of technical background and you need to engineer or a chemist or a chemical engineer on your team, you don't really; it depends on who your product is. And so, I think one of the first things that they learn with brainstorming is, here's my team. Here's their strengths, here's their weaknesses. And, and I think that's a good learning experience for Purdue students is to figure out this is a team. Cause they're going to do that in their career. Here's a team who's the best at this and let those people shine. So, I think that's a really good learning experience for them.

And then, you know, you have to pitch it. So again, the entrepreneurship comes in. It's not just one piece of this that carries more weight. It's the whole package. It's the whole thing, it's their product, you know, did you pitch it well? And you have to do it to the judges. And then even one step further at the award ceremony, which is really neat, at the end of the year they have an award ceremony. Last year, we finally got to start doing it in person again. We did it at the Union. There were over 300 people there, there were companies there and, and the students are the reason everybody's there. They're highlighted. That's who everybody wants to talk to. You know, they come around and talk to you about and they, and they make um, you know, a lot of networking opportunities there.

But again, they get to pitch their product like a trade show. And we have another award there that's called the People's Choice Award. So, the team that gets the most votes from the people there that said they did the best job of selling their product or doing the trade show, they're eligible for another \$500. So, all that entrepreneurship and, and business learning that we help with them all year. Um, I think those are great reasons to do it. And of course, one of the biggest reasons is third place is \$5,000, second place is \$10,000 and first place is \$20,000.

AB: Excellent. So, certainly, I think the experience helps, but also there are some really great prizes and rewards, too.

MC: Yes, and they get to spend that for everything. You know, it's not like they have to invest that back into their company or anything. Once they get that money and it's split between the members that it's theirs to use for their education or whatever.

AB: Next I spoke to two teammates from Team Brilliant Bean that happened to win second place during the student soybean innovation competition. Taking home the \$10,000 award team, Brilliant Bean worked on creating a dry erase ink formula, a form of ink that can be used on dry erase boards, better known as whiteboards. And their new formula produced a dry erase ink that utilized the many benefits of the soybean plant to produce an improved ink formula. And this product solved the issue of a strong odor being present in the dry erase ink. Along with many other benefits within this team, I was able to speak with Josh Stephenson and Charles Sebright. First let's hear from Charles.

CS: Well, we had a whole bunch of ideas we wrote and then we just realized what we were writing on was what we could actually use for our product. We were writing with a dry erase marker on a whiteboard. And we were like, "Hmm, I wonder if we could do this." So, then we did a little thinking and figured out, well yeah, we actually can, let's work on it. Cause we honestly had no clue how a dry erase marker worked. We have no understanding of a lot of major chemistry that went into it. So, it took a lot of research and a lot of understanding just to figure out how a traditional one worked. And then we had to come up with a way to improve it and figure out, because we were, our main thought was to use the beans to eliminate the scent that comes from a marker, which we succeeded in doing. But this took a lot of understanding of the process, how it works and what adhesive properties we can gain from the soybeans to actually replace the old material in the marker that actually caused that, that smell, that kind of give you a headache when you used them. If you've used a dry erase marker, you know what I'm talking about.

AB: Did you have, I guess, a moment where you really felt like you had a breakthrough or like a big success? Is there a moment you remember pretty concretely where things really like started to go well?

CS: Well I'd say one time when we were working on the lab. So, we originally started out with a completely different formula. We actually were originally going to use some of an alcohol-based solvent in our product. But we decided on something else but or that came across because we forgot to add it into the mixture when we were making it. And we realized that it still works without it. So how, what, why—what causes this and why does it still work? And that actually allowed us to do a few things with benefits from the marker that we weren't expecting. Like if you used it in a preschool environment or a children environment, they could actually, if they accidentally consumed it, it wouldn't be harmful for them.

AB: Fellow teammate, Josh Stephenson also had a few insights to add.

JS: Last year, I had been a freshman and I knew nothing about this competition until my friend Charlie comes up to me and he is like, "Hey, I just heard about this soybean competition that

we could do. Do you wanna do it?" And I was like, "Sure, why not? Let's do this." And that's the scope of how I ended up getting involved was my friend was just like, "Hey, you want to do this?" And I was like, "Sure, why not?"

AB: So great. So, you had never been part of a competition before that deals with like creating an innovation, that kind of thing?

JS: Not really, no. This is, yeah, this is my first one. We were brainstorming ideas for what we could make, and we were actually writing them on—actually it was this whiteboard behind me. And so, we were like, we're writing ideas, you know, a couple of them were like, eh, maybe. And then we ended looking at the marker and we're like, "I wonder if we could make something out this?" And so, it ended up being the product we chose, you know, we had to do a patent search, everything on. We realized there's nothing out, like nothing ink-wise really that was out there. So, we were just like, well let's roll with this. Like this should work.

AB: Awesome. So yeah, it kind of came up naturally.

JS: Yeah, yeah.

AB: Very practical.

JS: Yeah.

AB: So, can you tell me a little more about the process of making this product at this point or creating this formula?

JS: Yeah, so in the competition, you're given kind of a starter sample kit to um, work with. And so, we looked at what was in there and we actually to start, we took the kit back to my room and started mixing a couple things. Seeing, because we had a couple rough ideas of what we might like, how we might get, be able to make this work. So, we started off just kind of mixing things in my room and uh, we used my microwave when we needed heat and all that. Eventually realized, okay, we're going to need a lab. So, we um, talked to our advisors. They had some lab space that we could use. Um, it was a lot of just a trial and error, like kind of we had, we knew that we would need some sort of oil. We knew that we would need some sort of other, um, base make act to make the, uh, our ink actually stick to the board but still be able to come off. So just a lot of trial and error in the lab and until eventually get your product to work.

AB: Yeah. And do you remember like any specific challenges that you encountered along the way? Were there any memorable moments there?

JS: So, we had finally like gotten the ink to where we thought it stuck to the board well and came off the board. Well now all we needed was something to put it in because we were going to load it into a marker and bring it to the competition. So, we needed just a tip and we're work. And so, we're working to get some sort of tip located. And at the time what we didn't

realize is that there was, was a shortage on felt tips, which is what we originally planned to load our marker into. So, we were like, "Oh crap, what are we going to do now?" So, our main challenge came with, "Okay, we have an ink. How do we actually show that this works? How do we like what, what do we do here?" So, what we ended up doing is we switched. So, we switched gears because originally, we planned to market it as a marker. Now we were just marketing as an ink. And so, what we did is we jarred it up, put our logo on it and we sent it to the judges. We brought it to the competition with Q-tips. And so, what we were able to do is we'd still have like a dry erase board of some sort to where now you can take the Q-tip because it still, it held the ink well and it could also act like a like felt tip. At the competition itself, we'd have people like dip the Q-tip into the ink and then draw on the whiteboard and they could see that it worked. We made sure that some of the judges had their own whiteboard and they could sit and kind of draw off our ink if they wanted to, which some of them did as we were presenting, which we thought was kind of funny. That how we went about getting around that challenge and it ended up working out well for us.

AB: Wow. That's awesome. So, you kind of innovated on the fly a little bit.

JS: Yeah, little on the fly. Yeah. Cause we were getting close to the deadline. We were like, "Oh crap, we need, we need to figure something out here."

AB: Of all things, right? So, that's great that you were able to find a substitute pretty quick. Along the same lines, too, is there a breakthrough success moment that you really remember well, or any moment that stands out?

JS: I would say one of our bigger success moments was when we were in my room. We were cooking up a, we were cooking up a batch and we took it to, actually, we found out the Q-tip method as we were doing this because we needed some way to draw on a board. And so, we had cooked up a couple samples. So far, nothing has really worked. And then finally we took our, the last sample we ever made in my dorm room and we took it to a whiteboard in, um, one of the study rooms and we took the Q-tip and we started drawing the whiteboard. And while it stuck, it didn't race very well, but it at least it stuck and didn't run to the board. It smeared, it still smeared on the board pretty bad, but at least it stuck to the board and everything.

So, I would say that was one of our bigger breakthrough moments. I had never developed a product from scratch before the competition. I had never really taken an idea from the groundwork and seen it all the way through completion and like seeing like all the actual research that really goes in to getting an idea off the ground and getting it to where you have some sort of a prototype that you can work with. So, I would say the biggest thing I took away from the competition is just the, the research that actually goes into product development being like, there is way more failure that occurs than success. And you have to, you have to work through that. Like you're going to fail so much as you're doing a competition like this and you've just got to learn to not get discouraged and keep going and address the problems as they come.

AB: That's huge. Yeah, it seems like it's all about the mindset and just knowing it's going to be a lot of trial and error and probably a lot of error.

JS: Yeah, a lot of error.

AB: Wonderful. Well that really takes me through my questions. Is there anything else that you feel like we didn't talk about that you wanted to bring up or address?

JS: I really think the competition's a great experience. So, if there's anyone who's thinking about doing the competition, I would advocate for it. Just simply completing the competition. It's something that you can also like list on a resume, which looks really good. But I think there's just a lot of skills you learn through doing and it's really fun, especially at the very end, you know, you've got everyone coming in looking at your product and like the attention is on you, like people are there coming to see you. And I think it's just a real, I think it's a really rewarding experience after putting in months of work into finally getting, getting a working prototype.

AB: So, will we see you again at soybean competition?

JS: Yes, we are most definitely planning to compete for a second year and we are hoping to place one spot higher. So, hopefully we can pull that off. We'll see.

AB: Next, I was able to interview Team Smulch. They took home the \$20,000 first prize for the Student Soybean Innovation competition. And from this team I spoke to Zuhail Cakir, Libby Plassard, as well as Ethan Miller about their innovation: Smulch. Their team designed a soy-based rubber-like mulch or "Smulch" as they've come to call it, which serves a variety of purposes. Smulch, in its different forms, can be used as playground surfacing, as well as mulch for flower and residential gardens. Currently the team has designed two prototypes, the rubber mulch as well as playground surfacing.

EM: So, our product is a, uh, a soy-based rubber mulch and the whole point was just to replace the existing rubber mulch that is already out on the market. So, we didn't have to use too much brain power, really, but soy and mulch just naturally forms together to make Smulch. It's, it's catchy, it's simple. So, it turned out to be the, the great name.

LP: We were kind of looking for something. We wanted to not just create like a soy-based product, but a product that was a necessity or something that was needed on the market. Um, and so one thing that we found was that the current like rubber mulch that's out there, and this goes along with playground, surfacing, turf beads, anything that's made from like that recycled rubber has been linked to carcinogens and has been tied to cancer. So, we were like, there has to be a way we can make this better. So, we just kind of used soybeans to re recreate that product that was already existing, but to make it less toxic.

AB: That's great. It's so interesting to hear about just how versatile a product I think Smulch can be, but also how versatile the soybean is, too. So, it's really intriguing that you focused on

Smulch as the example, and I'm sure even that posed a lot of different challenges and successes, too. But what challenges did come your way when you were going forward with this idea for Smulch?

EM: When we were first trying to like, make that first prototype of our product, um, we kind of just sat in the lab or a little office and we just did a ton of different trials, like, let's just mix whatever we can and figure out what works. So that was definitely challenging just because it's, it was hard to know exactly what we wanted and so it's just, let's do it again, let's do it again, which could always get a little disheartening, but it wasn't terrible. And then we ran into a few roadblocks along the way. So, towards the end, it turns out we were accidentally given like an incorrect oil that we thought was something else. And so, we used that one, but it didn't work with our product.

AB: Oh, no!

EM: So, all of a sudden, our mulch wasn't working. It wouldn't like harden in a lab. So, last minute, we're scrambling around trying to find the right oil that we needed, but um, it all worked out. It was just some, just some stressful moments there.

LP: I would definitely say when we finally got that last prototype to set, because the way our product works was we like poured it into a mold and then it would set, and then we would either grind it up like the mulcher, we'd leave it like it was the playground surfacing. And so, when we, after we found out we had the wrong oil, keep in mind that all of our products were due like the next day. So, it was like, "Oh no!" Very last minute. And we thought we were ahead of the game. We thought we had it all figured out and we definitely were not expecting that. So, once I remember like, going back to the lab, like literally I would go and check on it like all the time and be like, "Is it setting? Is it setting? Is it setting?" Because I was so nervous that it wasn't going to set, but it did and it all worked out.

ZC: So, what I learned from this competition was that it was very much fun to work with a team and then coming up with an original idea to work on with your own interest and coming up with a new product. That was just like a quite a journey for all of us to learn throughout the way and basically coming over these challenges.

EM: It definitely was fun working in a team. Something that I think I learned is we—or at least I—would spend so much time focusing on like the, the physical, like what is our product going to end up like, you know, the actual product. But something huge that I didn't think of until the competition was how you sell it to people. Like getting up there and presenting your work, like just that presentation is very important. So being able to do that research and know who you're selling your product to was definitely very beneficial.

LP: Yeah. And going along with that, one thing that I really was kind of like reaffirmed through this little competition is the importance of having a business plan and a mindset going forward of this is where we're going and this is what we want to do. So, like we knew from the

beginning that we wanted to create small and as we went along we were like, we know that we want to market this as an environmentally friendly option, as an option that is safer and healthier for individuals. So just having like those, those key business ideas, too—obviously we're not creating like a whole business, but you really are creating like a business pitch and a market research plan. And so, like knowing from the beginning what your foundation is building up from that, I think it makes a more cohesive project at the end.

ZC: Yeah, I want to add onto that actually. One of the other important things that I learned, was like we're not only making like a, you know, product, but we are trying to make actually like a profitable product at the end in order to make this product at like attractive for the, you know, soy makers. Uh, even though our product at the end was like the same price and that we would create it, but also what's out there, like our competitors. I think we, on the way, figured out like how to make this product into like a business idea.

AB: I think along the same lines, too, do you feel like you have any advice that you would kind of generally give to others maybe participating in the competition or other people who are just interested in innovating and creating or even working as a team?

LP: I would say definitely don't forget the business side of it. I know that I'm biased because like that's my background, but, um, especially for the soy competition, a third of the final judging is your actual prototype. A third of it is your market research plan and then a third of it is your presentation. So, two-thirds of the whole competition really are rooted in the, the business of this is this product actually going to sell as this something that people would actually buy. So really, like, making sure that this is something that's feasible not just to make, but that people would actually want to buy, that people would choose to buy over something else. That's probably my biggest piece of advice for the competition.

AB: Great.

EM: I think she's definitely right on that, but you also do need to make sure that your product can back up the things that you're saying it does. Cause if you go in and you're like, "This is great for the environment and it's easy to make," but if it's not, then it's not going to sell. It's really hard to balance these things, but if you can make a product that works, you definitely need to focus a lot of effort into how you present it in the market.

ZC: The third thing I guess I will add onto that, I guess like making sure, like delivering the things that they want on time. For example, one comment that we got after the presentation and like after everything was announced, we were not only good from the business parts—all our presentation reports, they like every three points were well done and on time. So that made us accomplish the end the results that we wanted.

AB: Can you tell us a little bit about where you placed and what that moment was like?

EM: So, I know for me, a lot of the other teams were super accomplished people and very smart and they worked really well together. They had a lot of experience as they would do it in the past. And so, going in it's like, man, we're the underdogs here. We've never done this before. I mean, two of us were barely in college when we started, so you know, you get there and you, you present and it felt great like our presentation and our product, but you never know, like seeing all these other teams who are awesome. So, when they announced us it's like, no way, because all these other people that you think would be better than you. And not necessarily that they aren't, but it just happens that we killed it on our presentation and all that stuff. So, it was just a great feeling. It was like surprise and um, it felt awesome.

LP: And going along with that, I know we were kind of sitting there like, because the way the soy competition works is that there's first place, second place, third place, and there's also like a People's Choice award. And so, we were kind of just hoping for something. And so, we're sitting there and every time they announce an award and it's not us, we're like, "Oh man, you know, like we didn't get anything. That's okay, but like kind of a bummer." And then we're like not expecting to get first place. So, they announced second place and we're like, bummer. But then we got first and we're like, What? No way. Like that we were not expecting it at all. So, it was a good experience for sure.

ZC: Yeah. And one thing I guess, we didn't know any of the other products until the very end. So, after seeing all those very good products, we were like, "Oh, there is no way." And after, especially the very recent challenges that we have at the competition, we're like, "Okay..." But then, after they announced us, yeah, I was very much surprised because none of us were expecting this result.

AB: And with that being said, the Purdue Student Soybean Innovation Competition continues annually continuing to foster this creativity among students and their innovative uses of soybeans. Thank you so much for listening to this episode of the MakeYourStory podcast. We certainly hope that you will continue to tune in to future episodes and certainly continue exploring more information about the MakeYourStory podcast. In order to access our website, please visit lib.purdue.edu/maker podcast. See you next time.