



# Strawberry Production Automation

John Lin, Ph.D.

Production Automation Manager

# Role In Automation



## Fund

RFP / Internal Research



## Facilitate

Targets / End-user Feedback / Validation Studies



## Coordinate

Seminars / Field Days / Introductory Meetings



Planting



Pruning



Pest Management

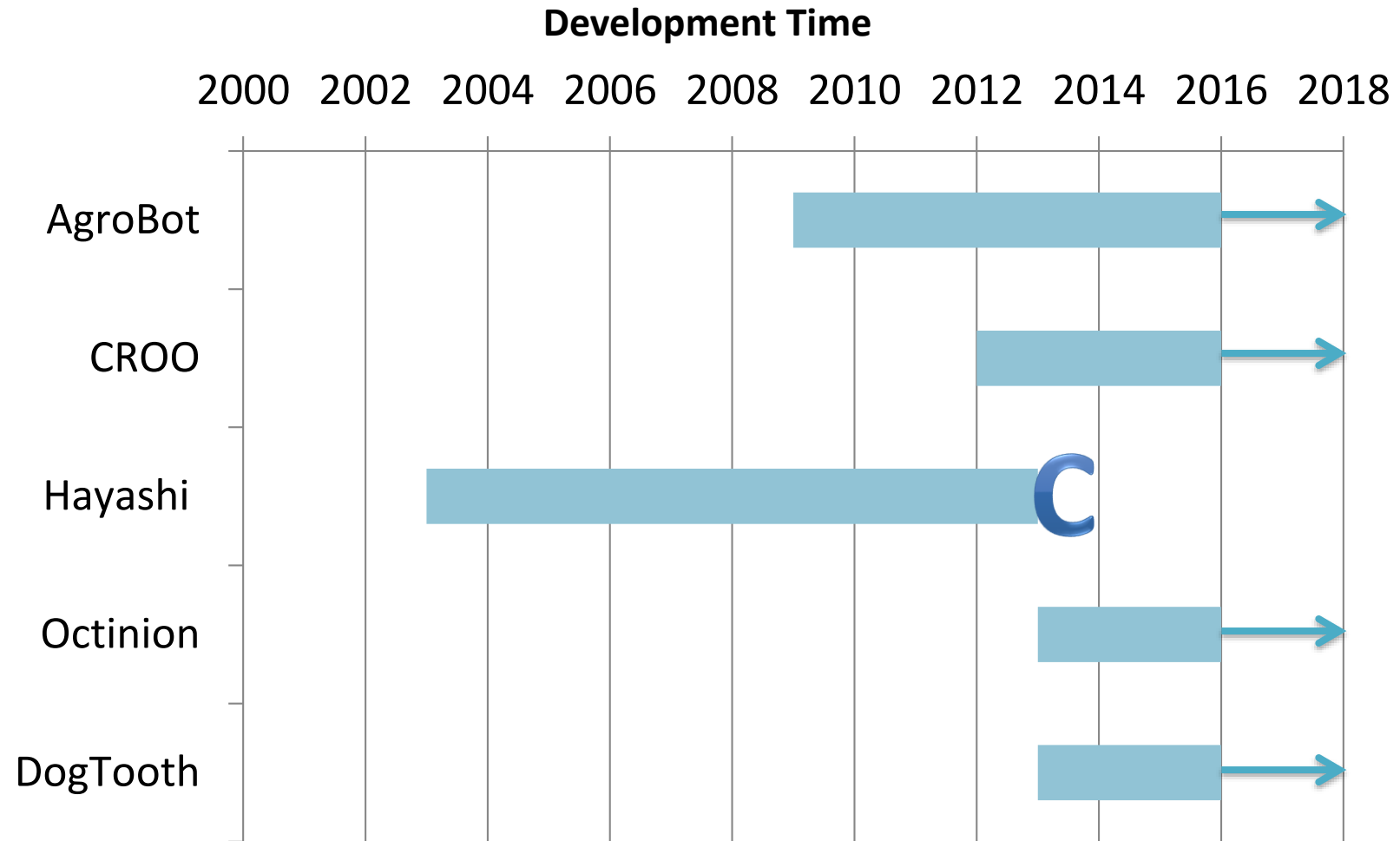
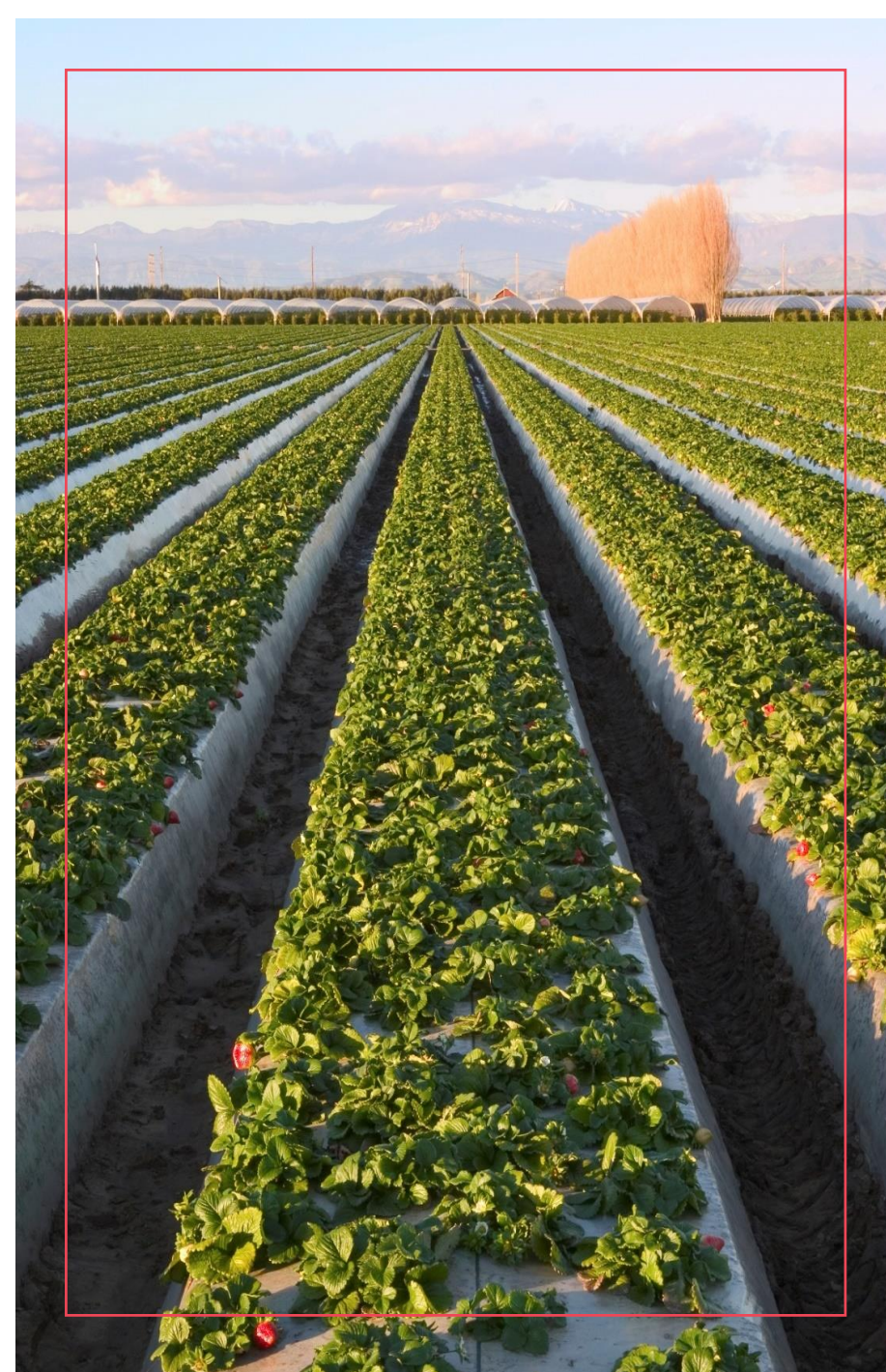


Picking



Processing

# Automated Harvester



# AgroBot 2009 – 2016



# CROO 2012 – 2016



GoPro mounted next to Pick  
Wheel 3\_1\_16

# Hayashi 2003 – 2013



NARO

農研機構

独立行政法人 農業・食品産業技術総合研究機構

# Octinion 2013 – 2016



**OCTINION**  
Engineering the future



# DogTooth 2013 – 2016

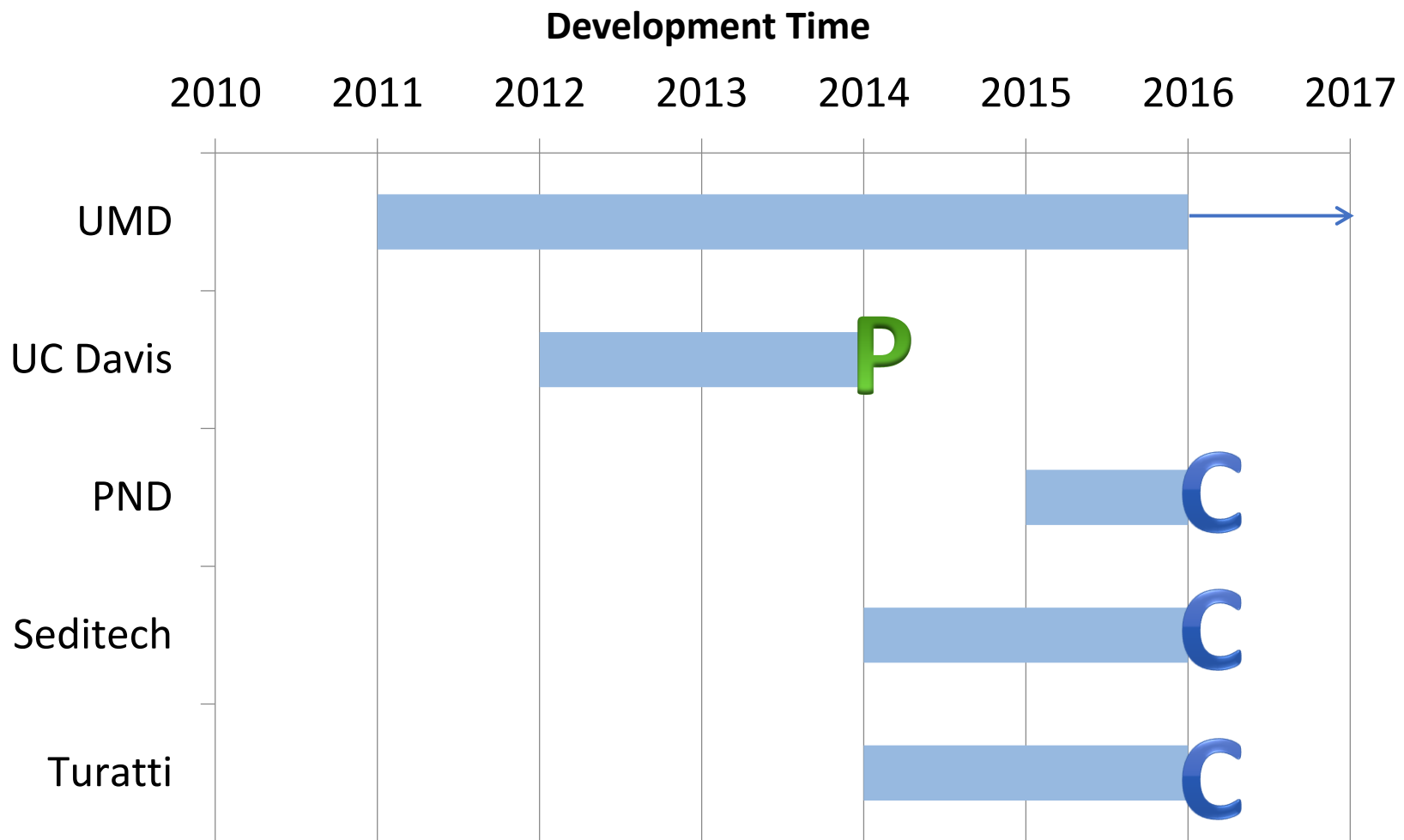


# Strawberry Packing





# Automated Decapper



# SEDITEC S.A.



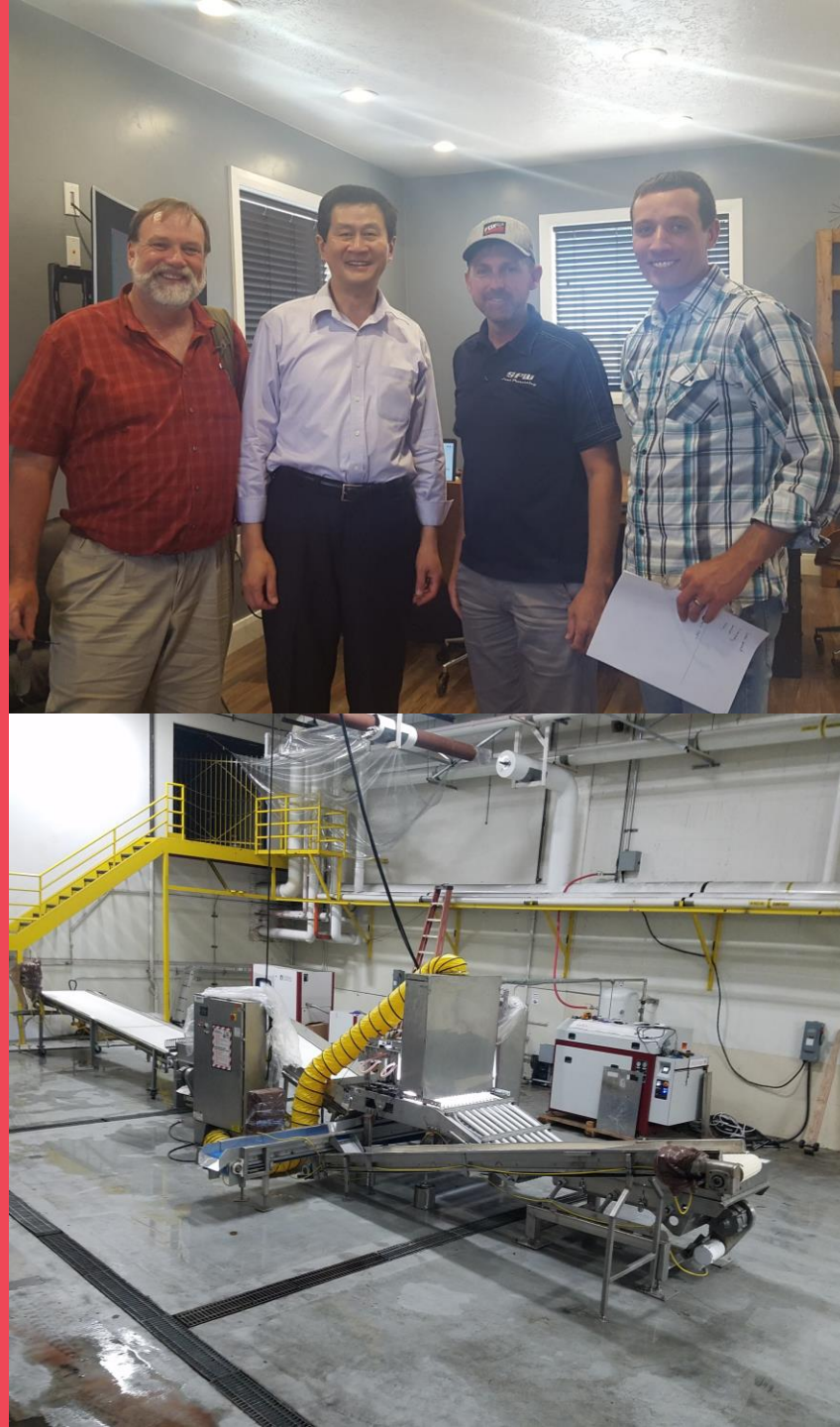
**SEDITEC s.a.**

# PND



Fund

Jan. 2017 BOD / PSAB / ATF  
↓  
Feb. 2017 CSC - UMD Visit  
↓  
Mar. 2017 PSAB - UMD / ATF  
↓  
Apr. 2017 PSAB / MFGs  
↓  
May 2017 MFGs – UMD Visit  
↓  
Jun. 2017 MFG – UMD  
Collaboration



# Strawberry Decapper

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**Principle Investigator**  
Dr. Yang Tao, P.E. of University  
of Maryland

# Automated Transplanter

- Plantel Plug Transplanter – 2 years
- Posi-Flow Plug Transplanter – 2 years

# Plantel Plug 2014 – 2016





# Faulring Plug 1986 – 1988



Coordinate

Sep. 2016

RFP



Nov. 2016

Vetting



Feb. 2017

Seminar



Mar. 2017

ATF



Jun. 2017

Investor  
Involvement



# Strawberry Transplanter

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**Principle Investigator**  
Frank W. Faulring of Faulring  
Mechanical Devices, Inc.

# Cal Poly Strawberry Center



## Faculty Research

8 Professors – Salinity / Forecasting / Runner Cutting / Decapper Economics / Telerobotics / Robotics / GIS



## Student Research

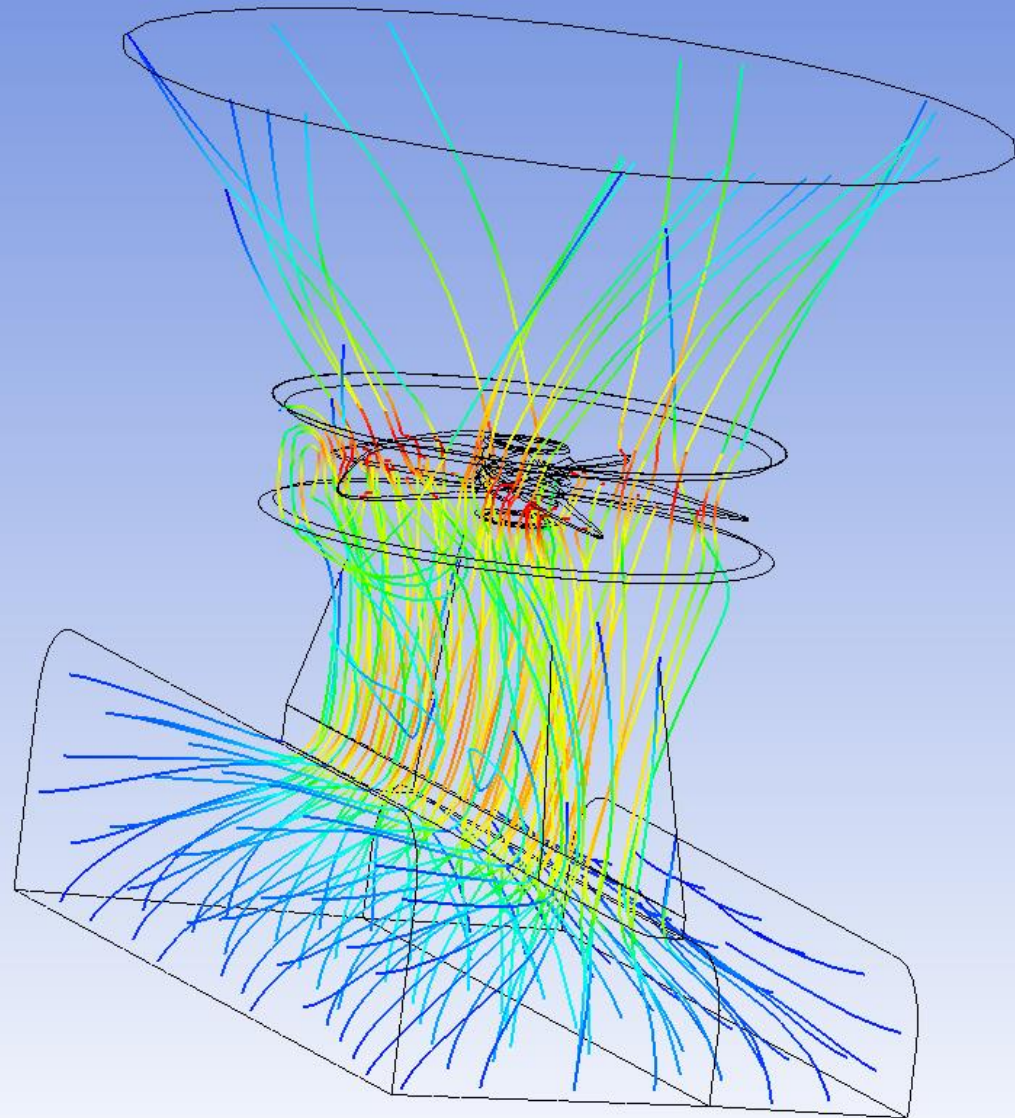
50 Students – Alumni / Research Associates / Master Students / Capstone Groups



## Internships

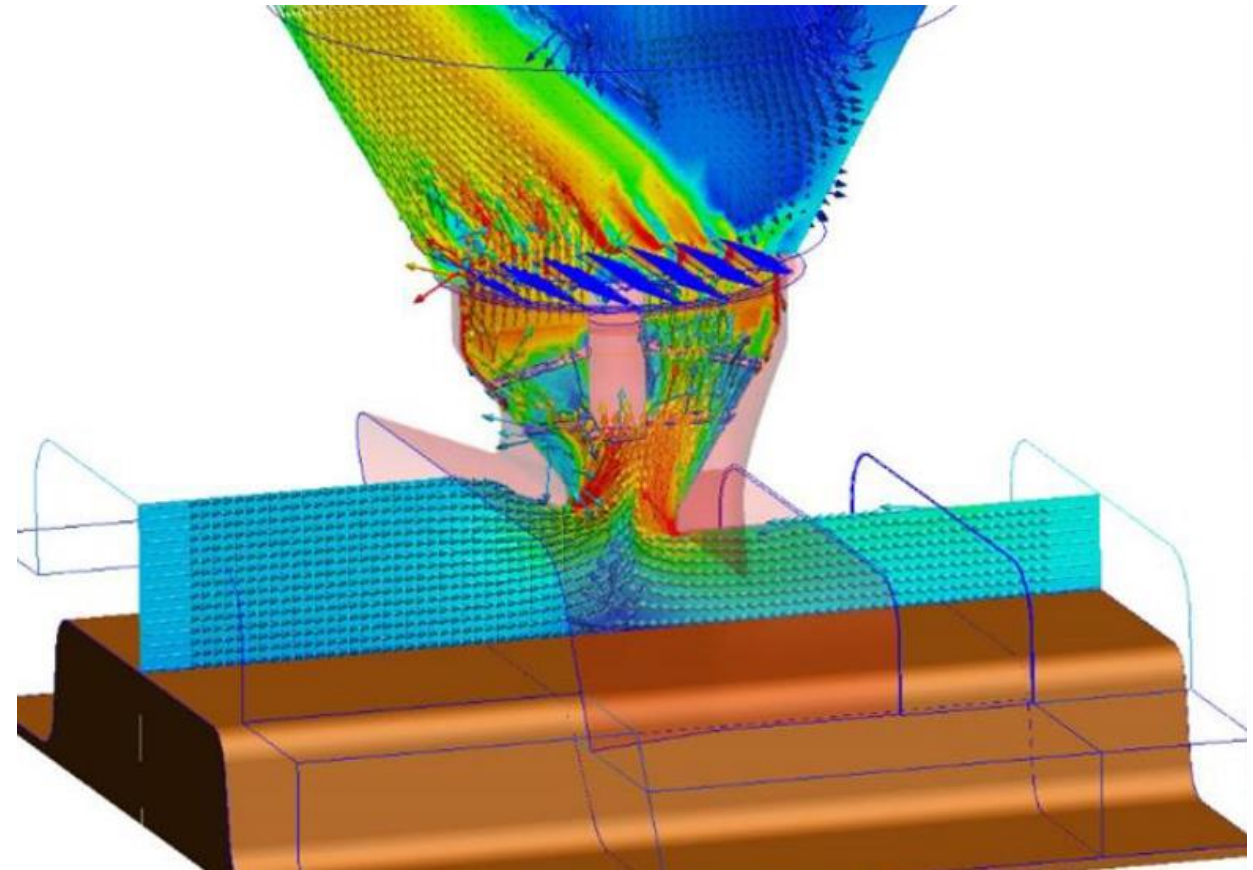
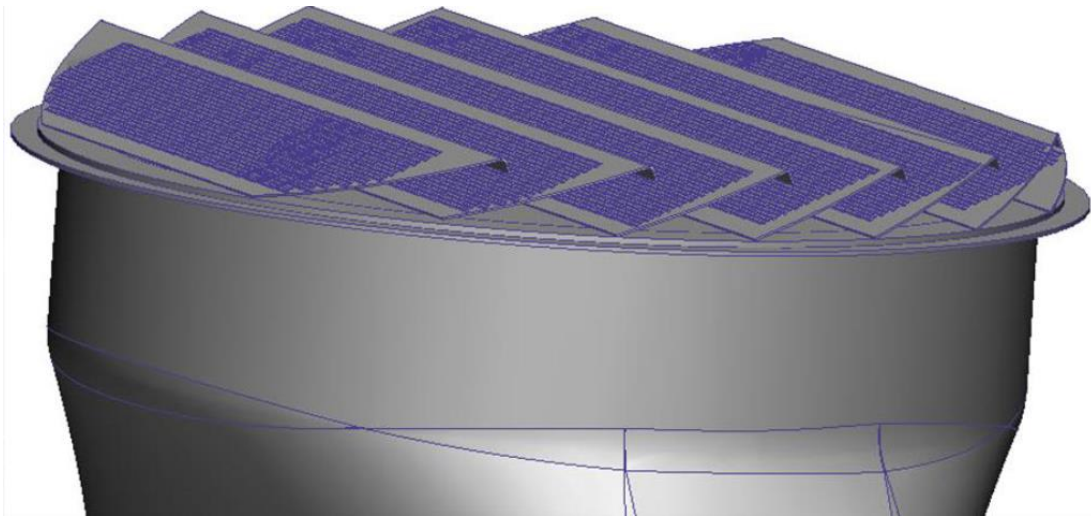
4 Interns – Runner Cutting / Lygus Bug Vacuum / Spray Rig Design / Bare Root Transplanter

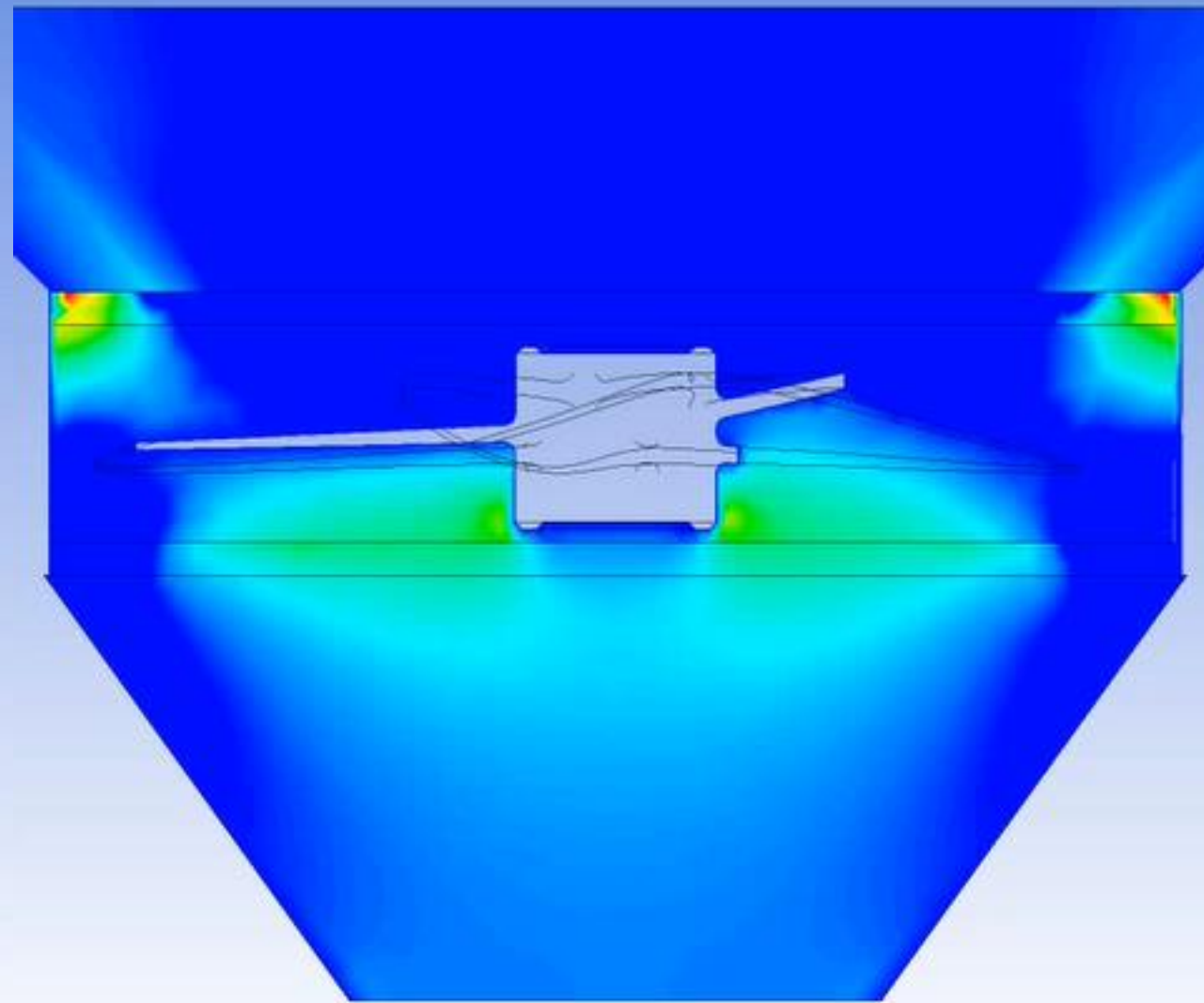
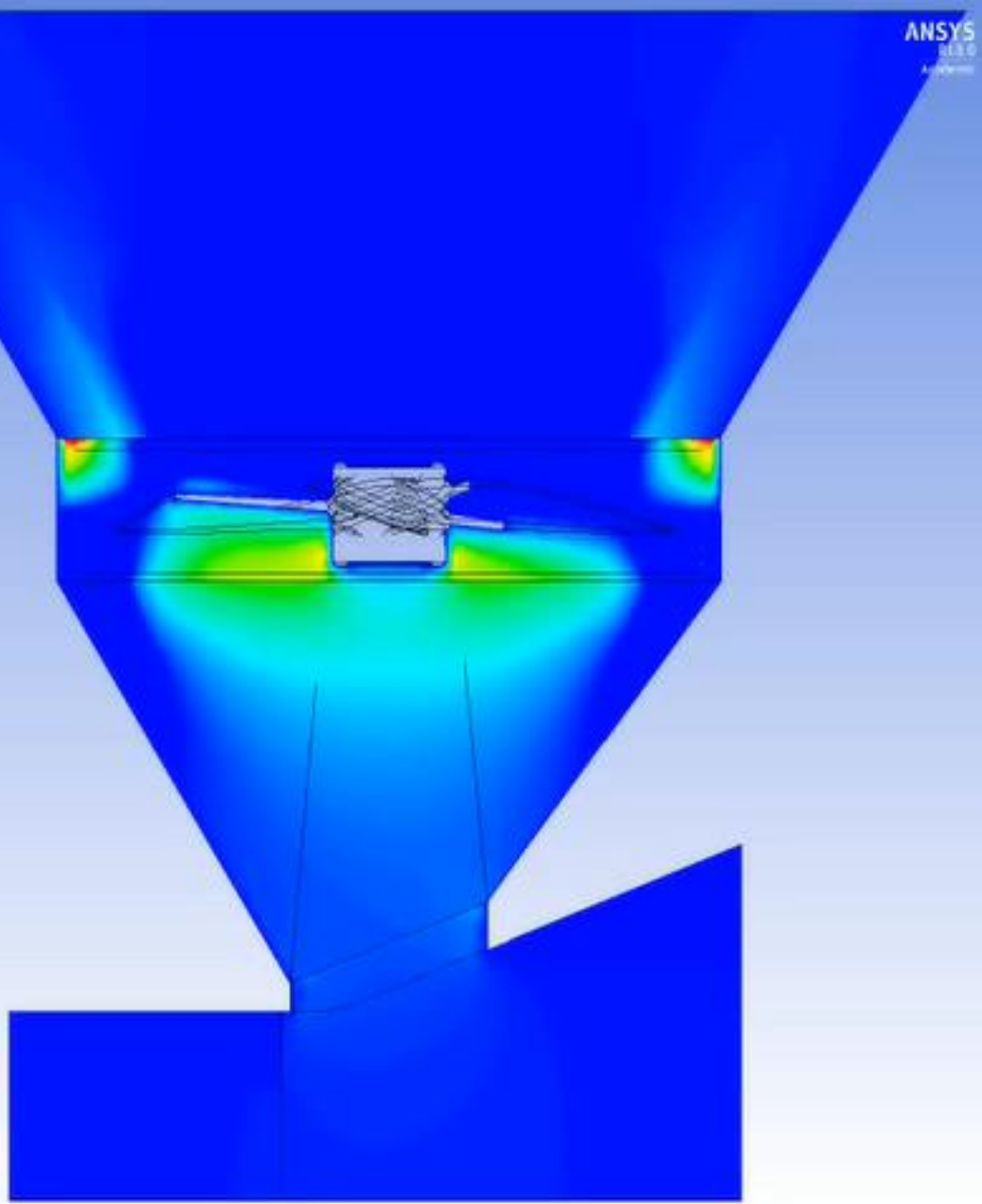
# Numerical Modeling



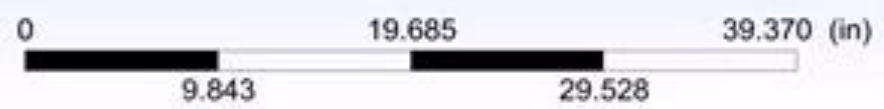
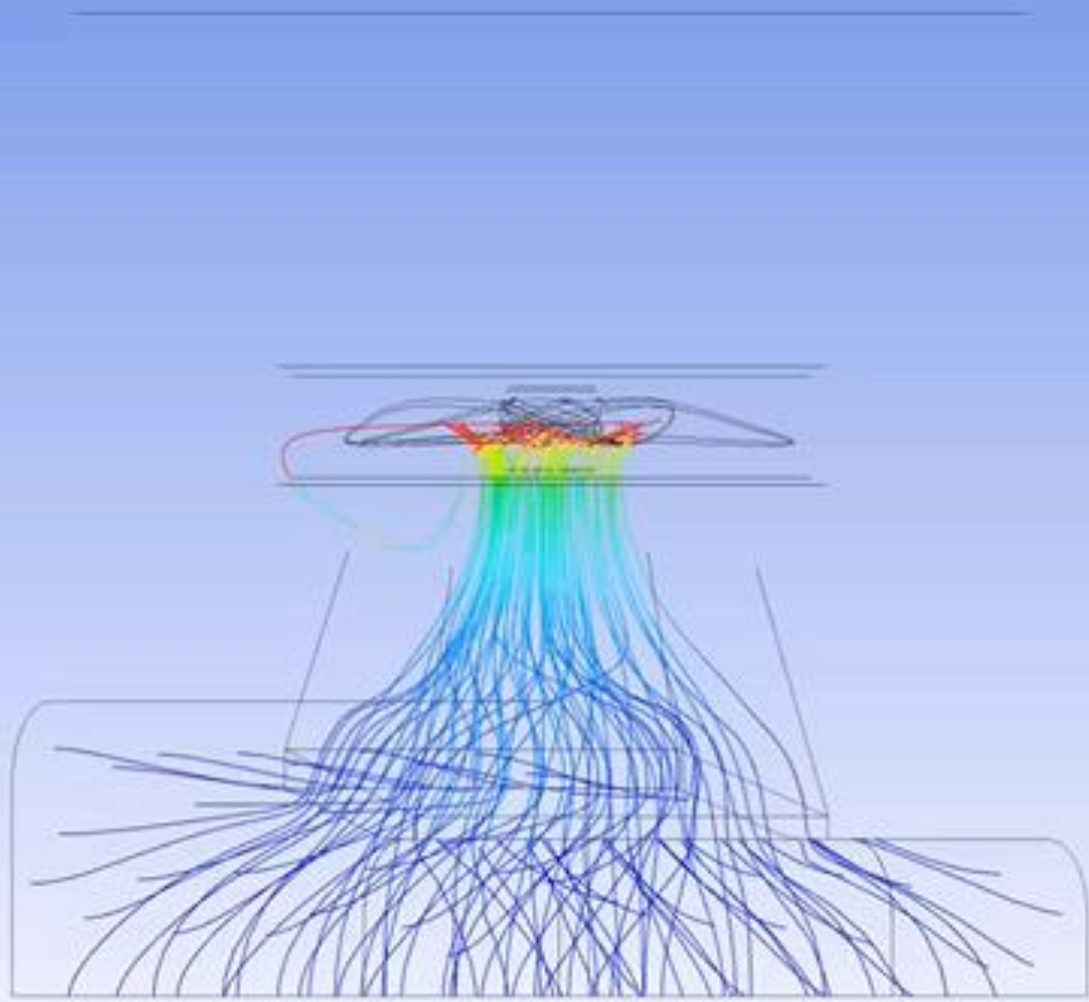
- Computer simulations
- Allows for rapid design modifications and testing
- Ensures that physical prototyping is cheaper and faster

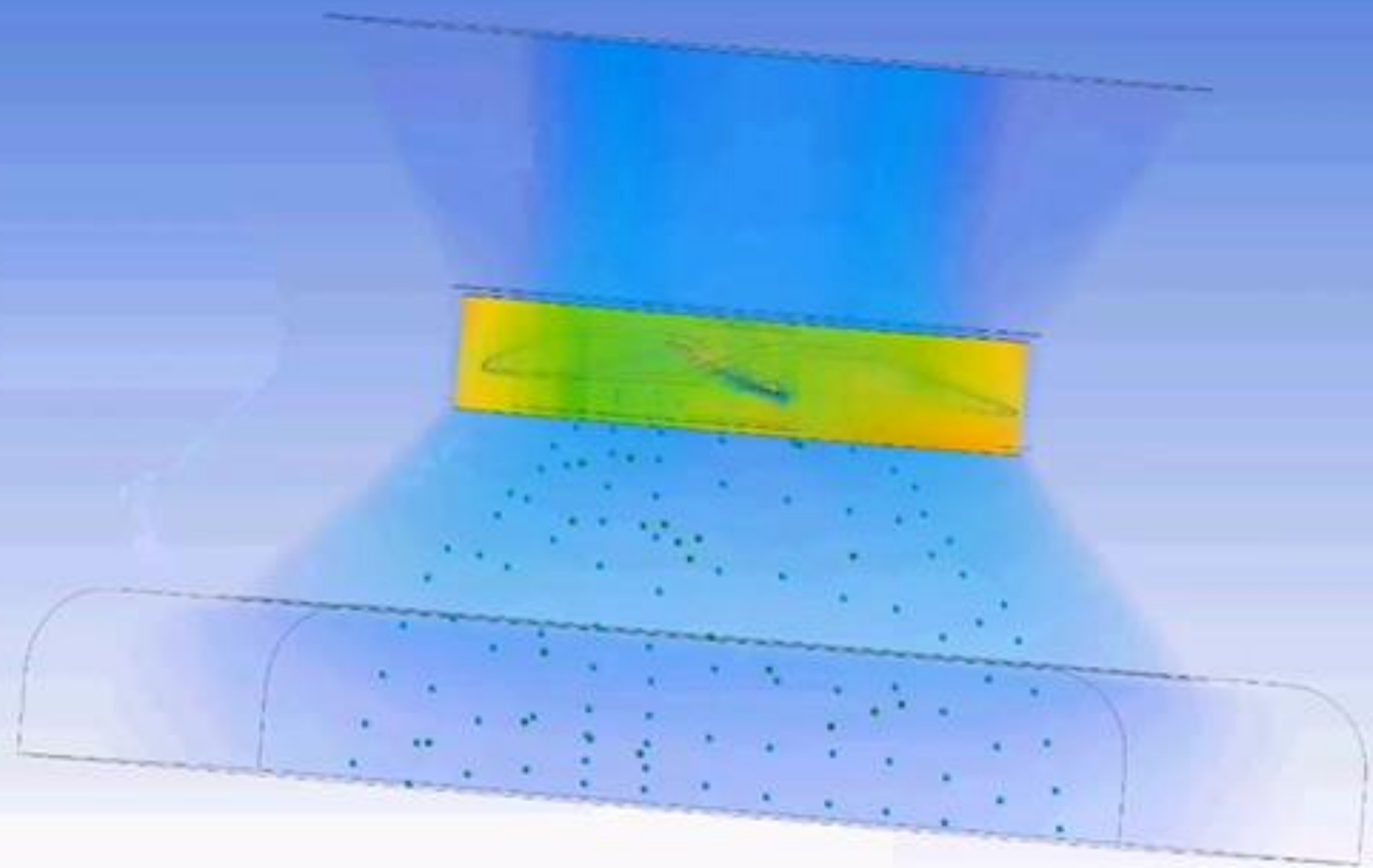
# Lygus Bug Vacuum – CFD





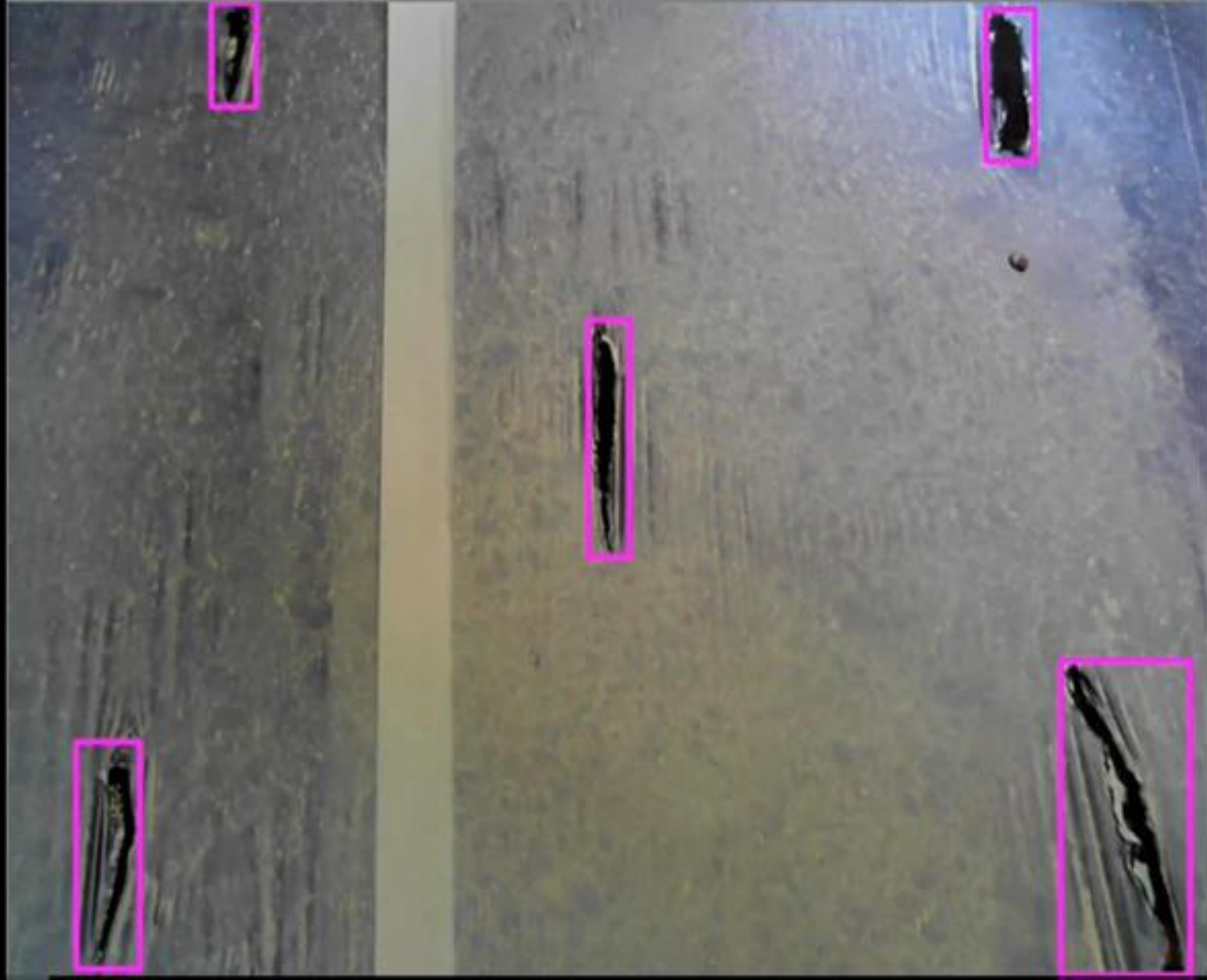
Velocity in Stn Frame  
Inlet Streamlines  
5.500e+001  
4.125e+001  
2.750e+001  
1.375e+001  
0.000e+000  
[mile hr<sup>-1</sup>]





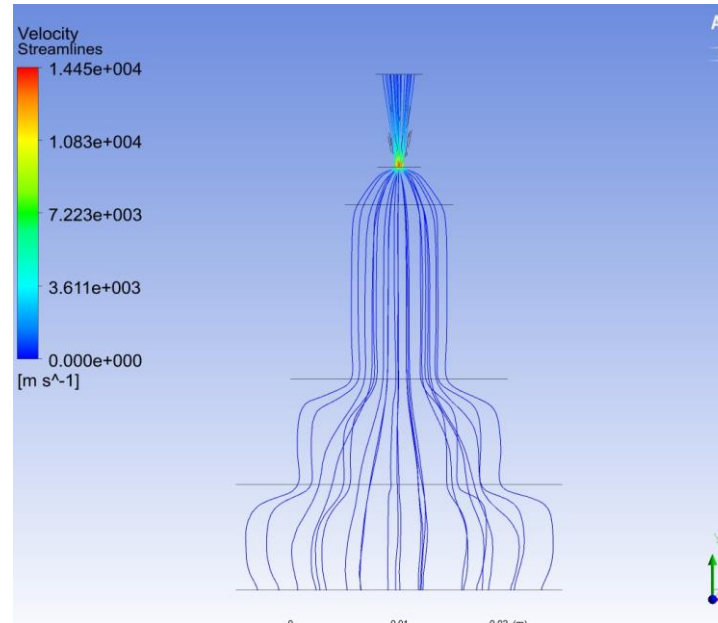






# Spray Rig Design Approach

$$Re = \frac{\rho v D}{\mu}$$



1. Analytical

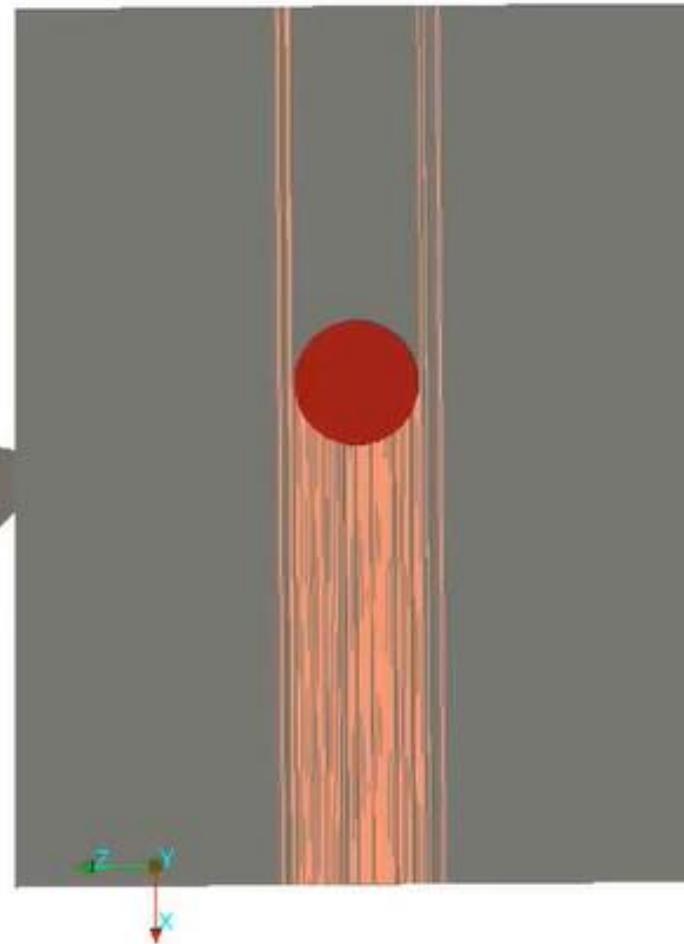
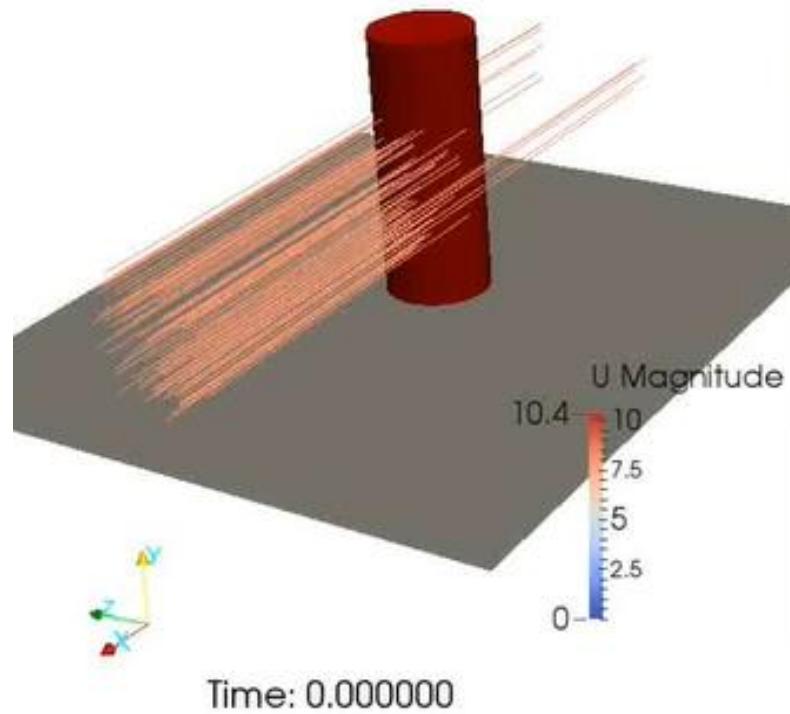
2. Numerical

3. Empirical

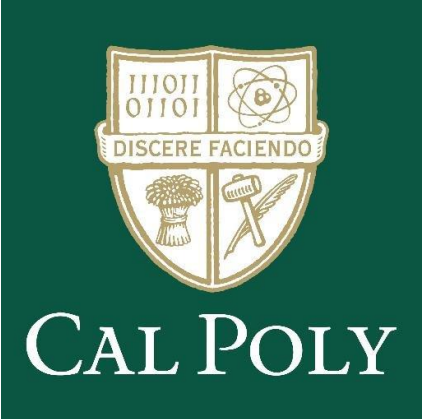
# 3D Scan



# Multiphysics Simulations



# Local Developers



# Existing Developers



AG TECH: 100+ TECHNOLOGY COMPANIES CHANGING THE FARM

## FARM MANAGEMENT SOFTWARE



## PRECISION AGRICULTURE AND PREDICTIVE ANALYTICS



## NEXT GEN FARMS



## MARKETPLACES



## ANIMAL DATA



## ROBOTICS AND DRONES



## SENSORS



## SMART IRRIGATION



## PLANT DATA/ANALYSIS



# Potential Developers

