

Stop the Rot Onion Bacterial Project  
Stakeholder Advisory Panel Meeting  
27 March 2024



# *Stop the Rot*

## *Objective B6: Bacterial Bulb Rot Risk Assessment*

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<https://alliumnet.com/projects/stop-the-rot/>

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United States  
Department of  
Agriculture

National Institute  
of Food and  
Agriculture

# Objective B6: Risk model scope and intended outcomes

**Aim:** Generate predictive bacterial disease models across diverse regions of onion production in the U.S

**Purpose:** Inform risk management decisions by growers

- Management responses in the field
- Tradeoffs - bulb storage vs. sale, based on risk of rot

## Initial approach (Years 1 and 2)

1. Mine large amounts of field data for key environment- and management-related drivers of bacterial diseases
2. Identify key drivers and interactions, develop testable hypotheses
3. Develop empirical predictive models for bacterial diseases of onion

## Adapted approach (Years 3 and 4)

1. Develop a simple, field-scale, risk scoring model based on Onion ipmPIPE project
2. Calibrate the model using expert knowledge, stakeholder input, and results of Stop the Rot field trials
3. Map key regional-scale environmental drivers of risk of bacterial diseases

# Risk assessment score has 4 main components

## 1. Current/Cumulative risk

- Previous week's risk score
- Confirmed disease symptoms
- Crop stage

## 2. Field variables

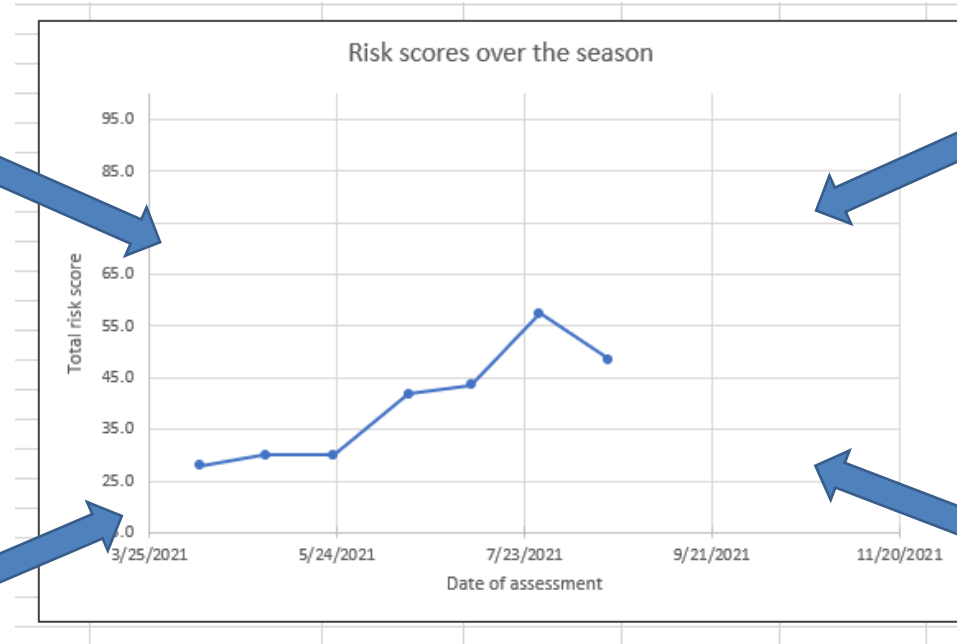
- Soil type (light/heavy/muck)
- Irrigation type & strategy
- Rotation
- Variety
- Plant density

## 3. Environmental variables

- Max daily air temperatures
- Windspeed
- Relative humidity
- Precipitation
- Hail damage

## 4. Production variables

- Fertility (cumulative N)
- Fertility (N timing)
- Bactericide program
- Weed pressure



Week	Crop growth stage	Assessment date	Total risk score	Current/cumul risk	Field variables	Environmental variables	Production variables
1	(1) Seedling -1 leaf	4/10/2021	28.0	3	12	9	4
2	(2) 1-4 leaves	5/1/2021	30.0	4	11.5	10.5	4
3	(3) 4-8 leaves	5/23/2021	30.0	4	11.5	10.5	4
4	(4) Bulbing, 8-14 leaves	6/16/2021	41.8	6	11.5	20.25	4
5	(4) Bulbing, 8-14 leaves	7/6/2021	43.5	7	11.5	21	4
6	(5) 'Soft necks' stage: leaf	7/28/2021	57.5	12	11.5	30	4
7	(6) 5-50% tops down	8/19/2021	48.5	12	11.5	21	4
8	(7) 50-100% tops down	8/28/2021					
9	(8) At harvest, prior to sto	10/1/2021					
10	(9) In storage, post-harve	10/16/2021					

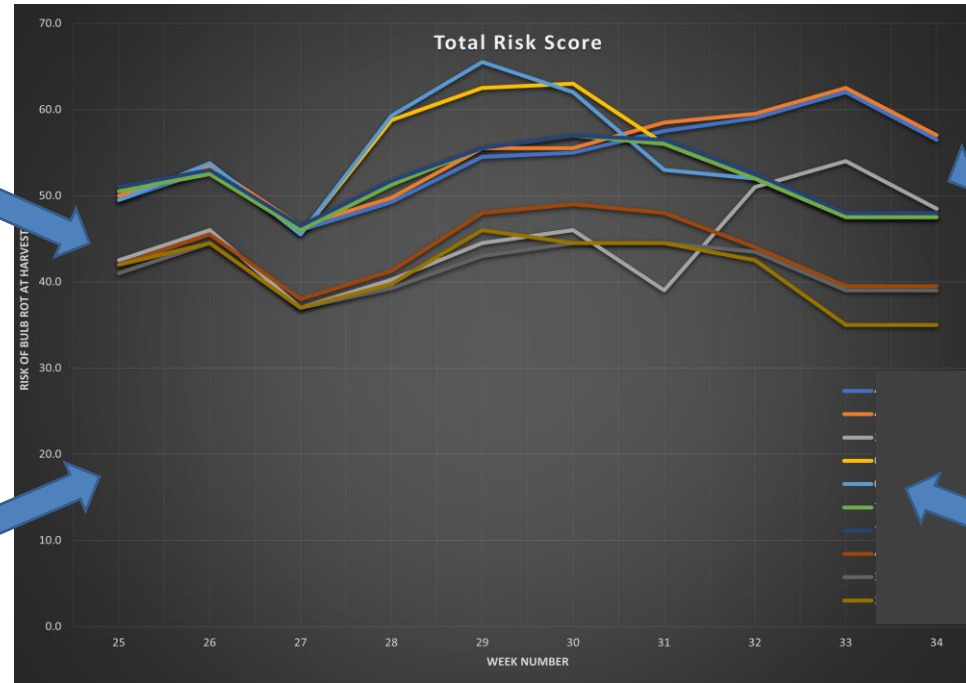
# Objective B6. Testing the risk model in 2023-24

## 1. Current/Cumulative risk

- Previous week's risk score
- Confirmed disease symptoms
- Crop stage

## 2. Field variables

- Soil type (light/heavy/muck)
- Irrigation type & strategy
- Rotation
- Variety
- Plant density



## 3. Environmental variables

- Max daily air temperatures
- Windspeed
- Relative humidity
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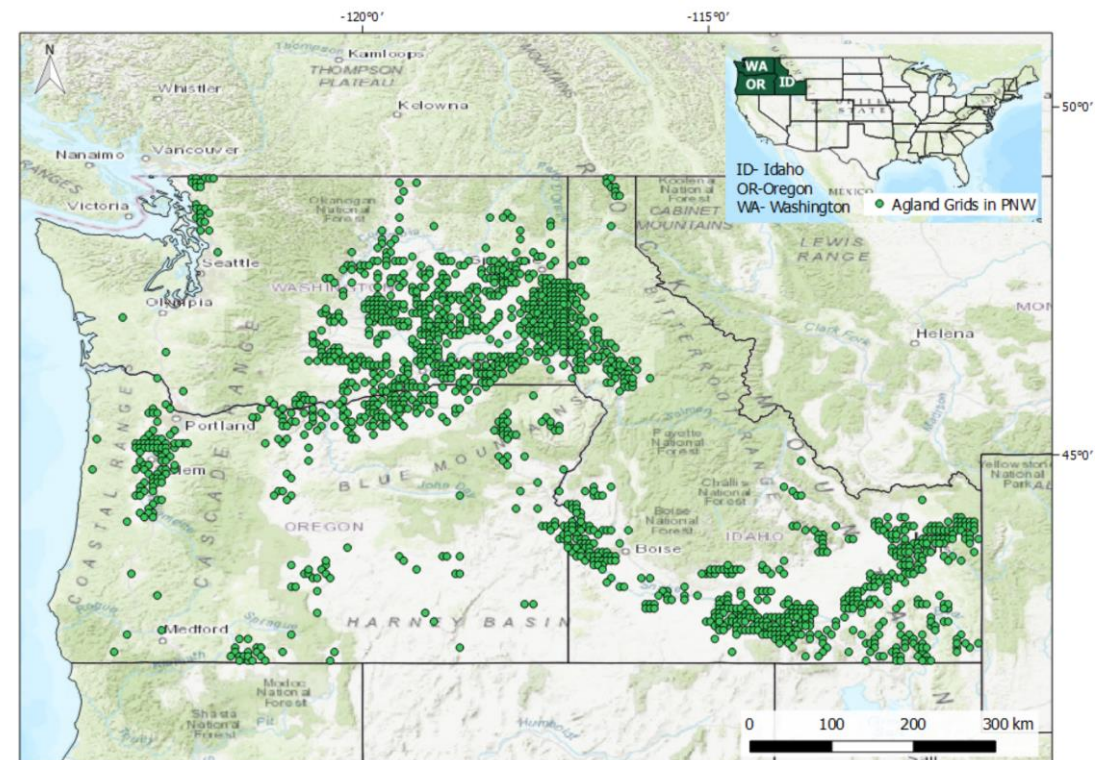
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# Spatiotemporal analysis of the key environmental drivers of bacterial diseases in onions for the Pacific Northwest USA

1. Maximum daily air temperatures (weekly avg.)
2. Wind speed (weekly avg.)
3. Relative humidity (weekly avg.)
4. Precipitation (weekly total)



# Objective B6: Bacterial Bulb Rot Risk Model Plans for 2024

1. Work with WSU Decision Aid System team to:
  - a. Test and refine the model with results from 3-4 seasons of Stop the Rot field trials
  - b. Test the prototype with PNW growers, and get feedback
  - c. Develop an app of the model
2. Work with StR team to adapt the model for other regions of onion production in the USA

## Stakeholder Advisory Panel questions & feedback