Forecasting Maturity & Yield in Vining Peas

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Introduction

- Vining peas have a very short harvest window which is expedited by hot weather, making advanced prediction of harvest date difficult.

- Yields can be highly unpredictable.

- **Objective:** reduce wastage caused by crop bypassing and inefficient factory processing through advanced forecasting of harvest dates and yields in vining peas.

Data Inputs

Vining pea group data

Crop data inc. drilling, flowering and harvest dates, varieties, quality (TR), yields.
>18,000 crops

Remote sensing

Sentinel-2 satellite data

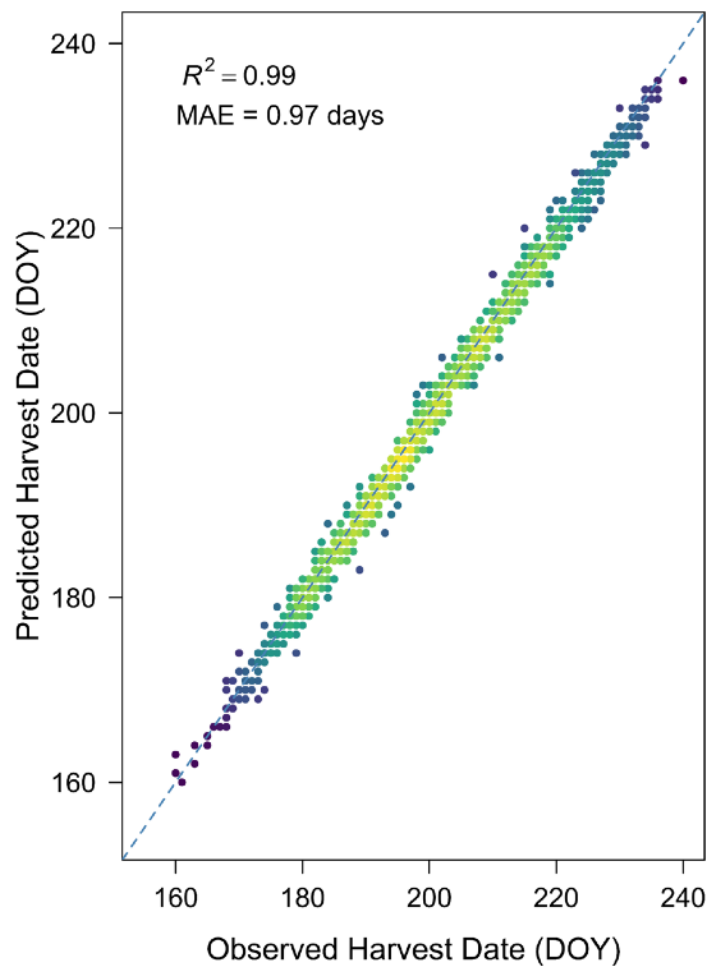Multispectral canopy reflectance measurements

Weather data

Daily data every 20km
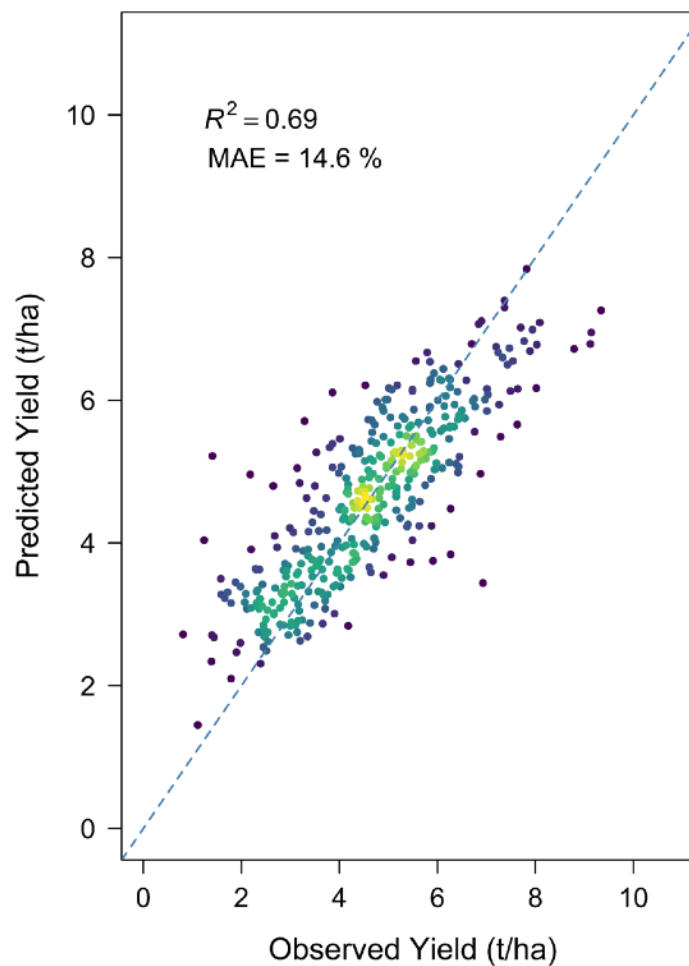
Machine learning

Harvest date & yield prediction models
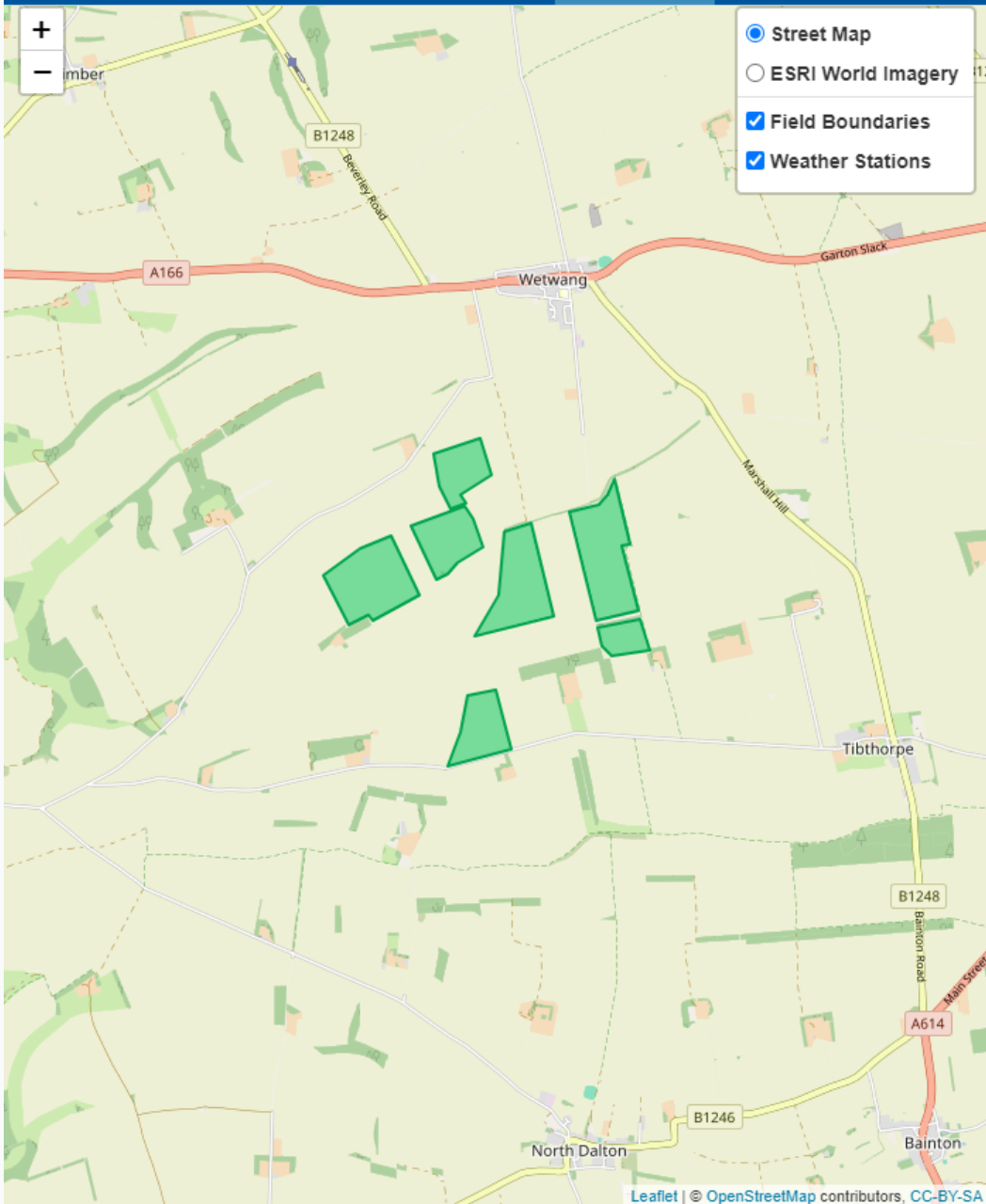
Forecasting Harvest Date & Yield

Harvest Date

$R^2 = 0.99$
MAE = 0.97 days

Yield

$R^2 = 0.69$
MAE = 14.6 %

Nocton2023: 10 June 2023

Street Map
◯ ESRI World Imagery
☑ Field Boundaries
☑ Weather Stations

Data Input

Select field boundary file format:

CSV file ▾

Clear map

Upload field coordinate CSV file:

Browse...   VP_Example_Coordir

Confirm upload

Upload crop data CSV file:

Browse...   L_Howells VP Data_T

✓ **916 crops detected**

Data preview:

Field ID	Maturity	Hectares	Drill date	Full-flower date	TR
Field_1	1	19	28/03/2023	27/05/2023	100
Field_2	2	26	10/04/2023	09/06/2023	100
Field_3	1	36	15/04/2023	14/06/2023	100
Field_4	2	11	NA	NA	100
Field_5	2	13	11/04/2023	10/06/2023	100

Submit

PGRO Vining Pea Tool

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Logged in as leah@pgro.org

Table   Planner

Search:

	FieldID	22 Jun	23 Jun	24 Jun	25 Jun	26 Jun	27 Jun	28 Jun	29 Jun	30 Jun	01 Jul	02 Jul	03 Jul	04 Jul	05 Jul	06 Jul	07 Jul	08 Jul	09 Jul	10 Jul	11 Jul
1	Field_164	-2	-1	0	1	2															
2	Field_168	-2	-1	0	1	2															
3	Field_171	-2	-1	0	1	2															
4	Field_158		-2	-1	0	1	2														
5	Field_1			-2	-1	0	1	2													
6	Field_109			-2	-1	0	1	2													
7	Field_110			-2	-1	0	1	2													
8	Field_159			-2	-1	0	1	2													
9	Field_162			-2	-1	0	1	2													
10	Field_165			-2	-1	0	1	2													
11	Field_166			-2	-1	0	1	2													
12	Field_169			-2	-1	0	1	2													
13	Field_170			-2	-1	0	1	2													
14	Field_163				-2	-1	0	1	2												
15	Field_167				-2	-1	0	1	2												
16	Field_179				-2	-1	0	1	2												
17	Field_101					-2	-1	0	1	2											

Showing 1 to 199 of 199 entries

Future Developments

- Machine learning models can be applied to any crop.

- Accuracy is dependent on accessibility and volume of historic data.