BLUE RIVER TECHNOLOGY

A Case Study in Lettuce: How Computer Vision and Precision Robotics are Raising Specialty Crop Yields 10%

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BLUE RIVER TECHNOLOGY

Make Every Plant Count™

- Precision lettuce thinning
- Computer vision
- Benefits of plant by plant treatment

Precision thinning requires two features

1. Detect lettuce with a computer and a camera
2. Spray killing agent with ¼-inch accuracy

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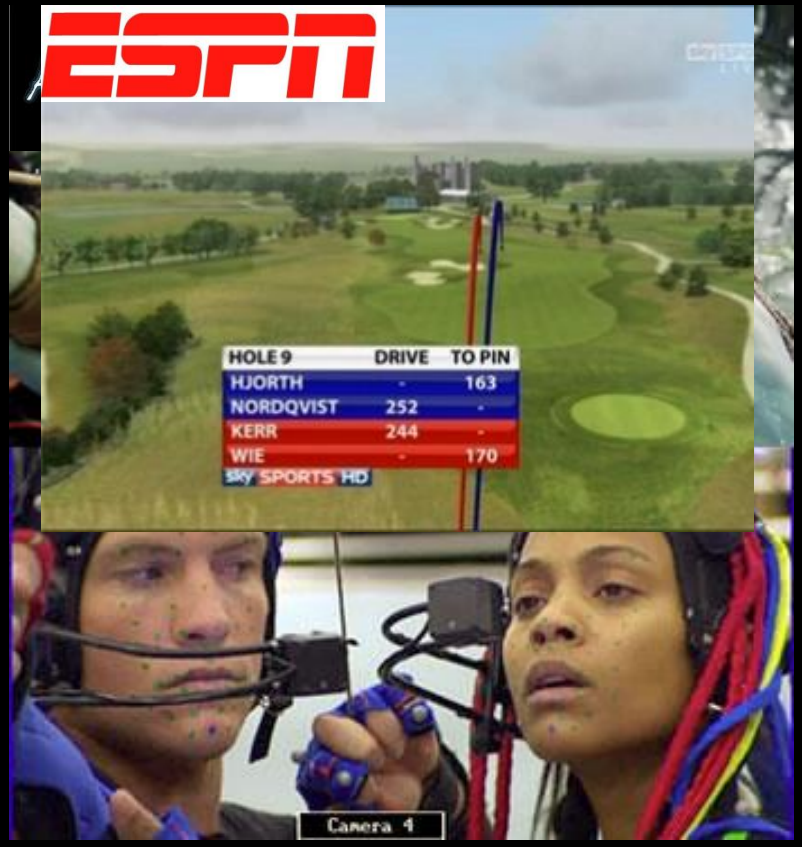
1. ***Detect lettuce with a computer and a camera***
2. Spray killing agent with ¼-inch accuracy

Made with Microsoft Powerpoint
“Remove Background” tool

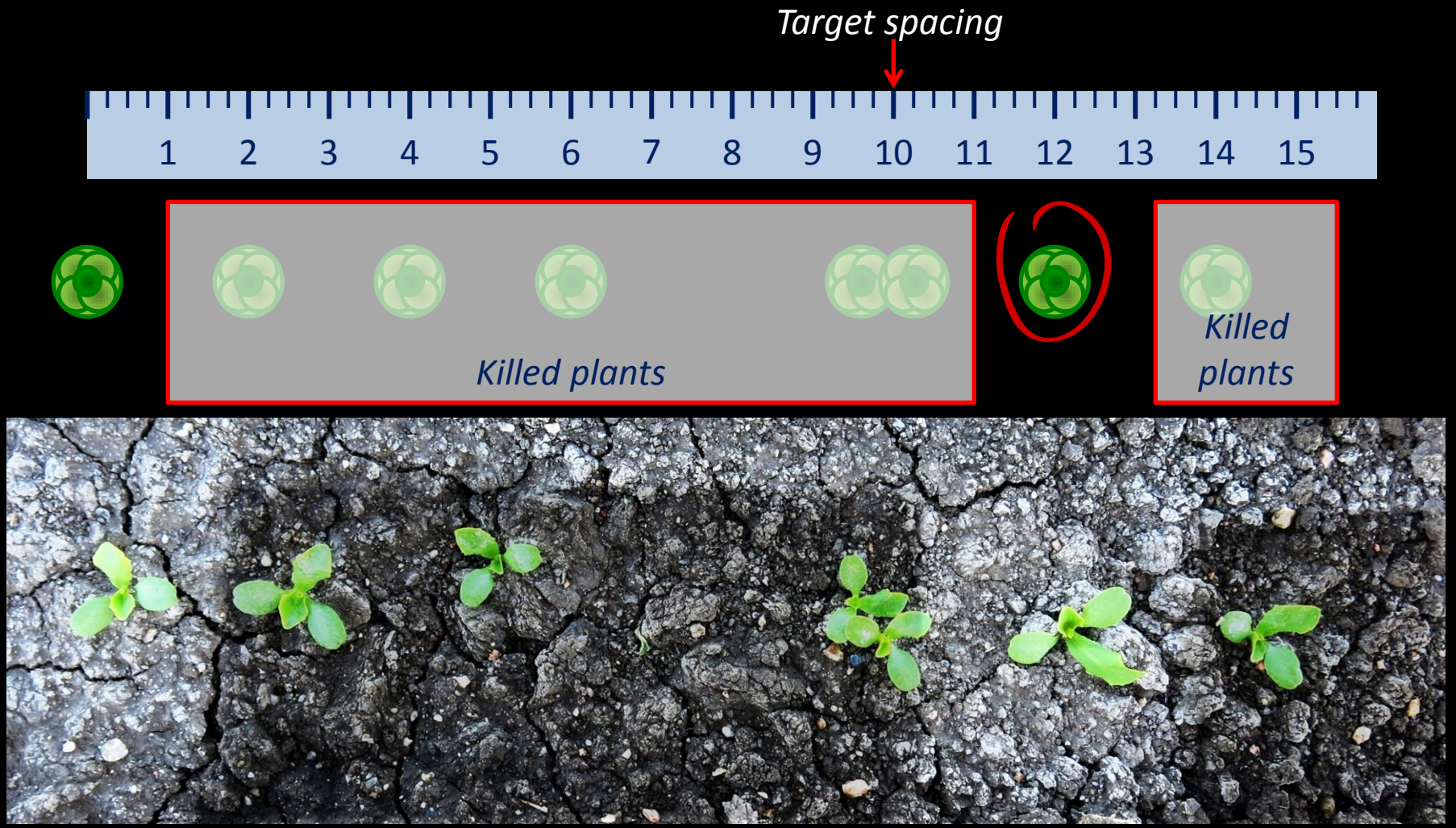
Computer Vision

Useful for simple object detection and tracking



Machine Learning

Useful for classification


Target spacing
1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
Killed plants
Killed plants

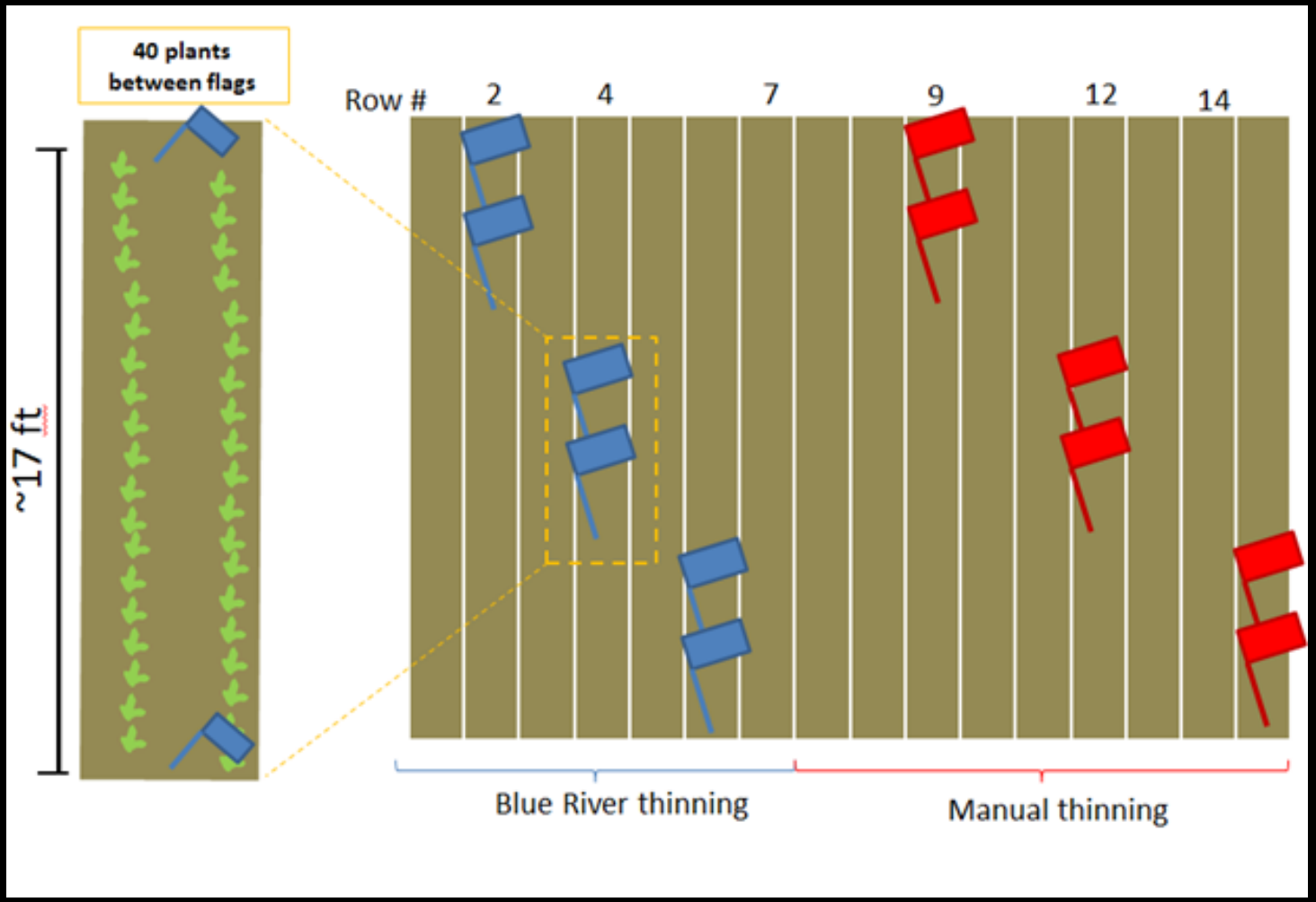
Precision thinning requires two features

1. Detect lettuce with a computer and a camera
2. ***Spray killing agent with ¼-inch accuracy***


1
2
FT & IN
INCHES
3
4
16 FT
5
6
7
8
9
10
11
1F
12
1F 1
13
1F 2
14
1F 3
15


1
2
3
4
5
6
7
8
9
10
13
14

Yield benefit of plant by plant care


40 plants between flags
~17 ft
Row #
2
4
7
9
12
14
Blue River thinning
Manual thinning

Field	BRT			Manual			% difference
	Plants per acre	% harvested	Boxes per acre	Plants per acre	% harvested	Boxes per acre	
1	32,200	97.5	1,309	31,712	87.3	1,154	+13.43
2	29,995	97.4	1,218	31,458	93.0	1,219	-0.08
3	29,756	96.0	1,191	28,852	89.1	1,071	+11.20
4	29,728	91.6	1,134	28,986	83.6	1,009	+12.36
5	33,118	98.3	1,356	31,238	96.4	1,255	+8.05
							+9.08