

The Agriculture Market Today



Held Logic Model Working Session

88

Interviews with Agriculture Sector



Attended Trade Show



Analyzed FRIS Data and
2010-2015 Program Data



Attended ETCC Meeting



Incorporated USDA Data Analysis



Compared 6th Power Plan with 7th



Consulted with Irrigation Experts





What do we know about agriculture within BPA's territory?



Dairy



Lighting



Greenhouses



Irrigation








What do we know about irrigation in BPA territory?

**Columbia
River
Basin**



KEY

-  BPA service area
-  Other utilities' service areas
-  Agriculture



Columbia River Basin Irrigation

BPA Irrigated
628,000 Acres



Non-BPA Irrigated
1,090,000 Acres



Southern Idaho Irrigation

Non-BPA Irrigated
2,145,000 Acres



BPA Irrigated
151,000 Acres



In BPA's territory, there is roughly four times as much irrigated agriculture in the Columbia River Basin than in Idaho



What types of irrigation systems are located in BPA territory?



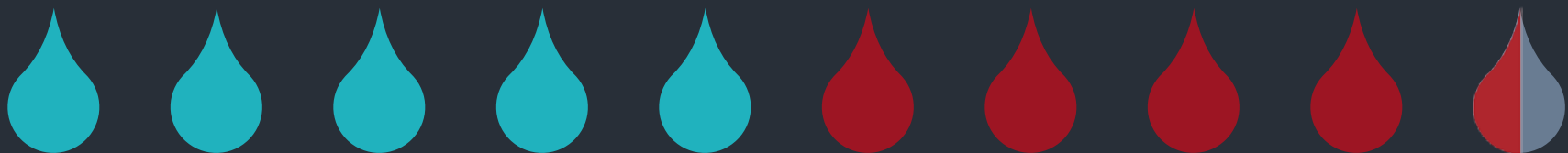
**SOLID SET, PERMANENT,
BIG GUN OR TRAVELER**



**DRIP, TRICKLE, OR
LOW-FLOW MICRO**



CENTER PIVOTS OR LINEAR MOVE TOWER



**SIDE ROLL, WHEEL MOVE, OTHER
MECHANICAL MOVE OR HAND MOVE**

OTHER





What do we know about efficiency of irrigation systems?



Two Types of Efficiency for Irrigation Systems



Pumping
Efficiency

Application
Efficiency



Pumping Efficiency

definition

Tracks the amount of energy that is transferred from the motor to the pump to the water.

Ways to Increase Pumping Efficiency



New Pump



Testing

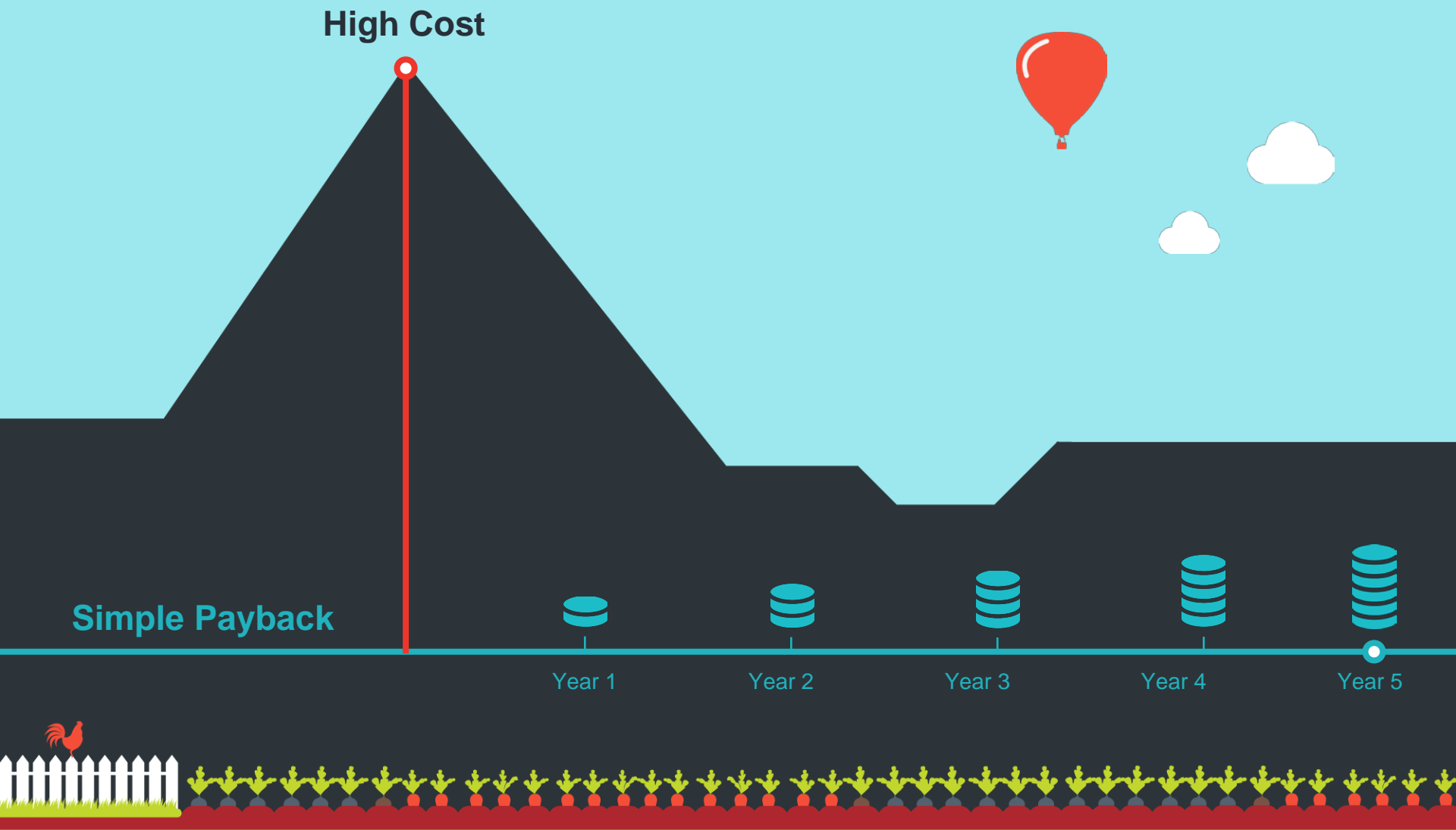


Trim Impeller



Add VFD





Perceived Market Barriers to VFDs



Pumps in the Current Program

1

Irrigation Pump Testing
and System Analysis

2

VFDs in Ag Turbine
Pump Applications

3

Green Motors
Rewind Initiative



Application Efficiency

definition

The amount of water that ends up in the soil compared to the amount that leaves the sprinkler heads.

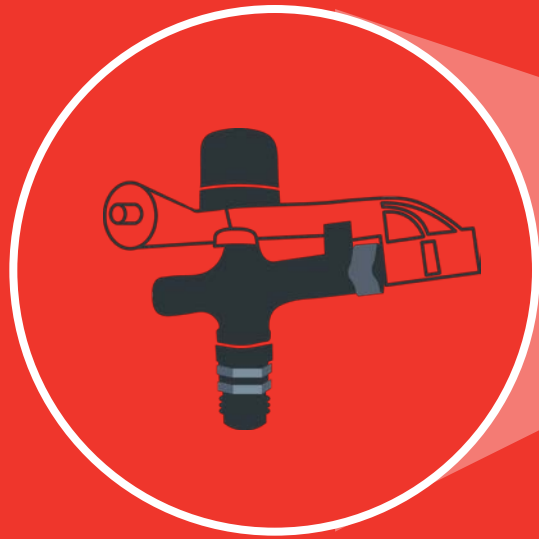


Application Efficiency Has Two Key Components

1. Sprinkler Type
2. Proximity of Sprinklers to the Ground



Sprinkler Type: Inefficient



Sprinkler Type: Efficient





Proximity of Sprinkler to the Ground

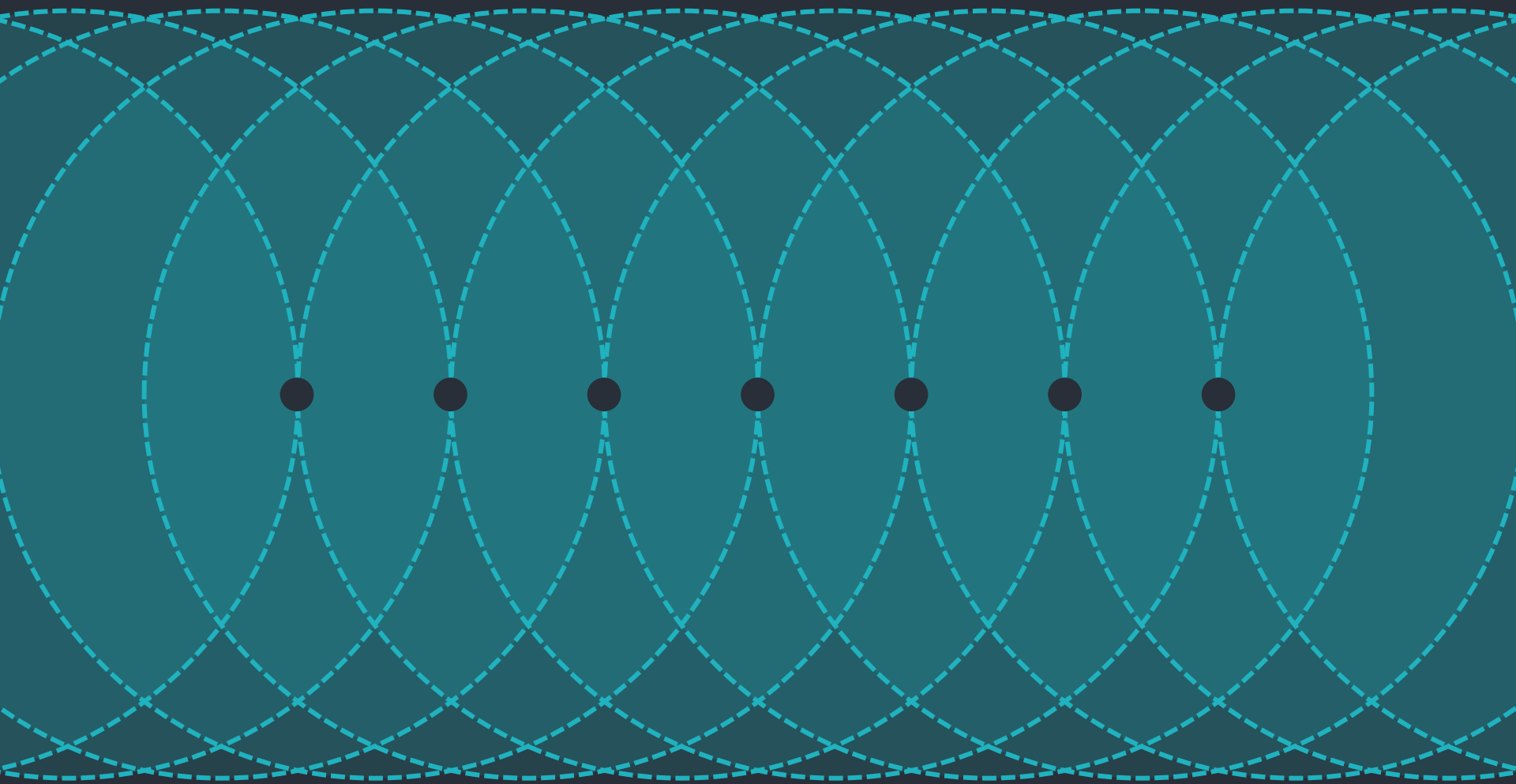


vs.





Water Uniformity



Changes in Sprinkler Efficiency in the Market



Impact on Top

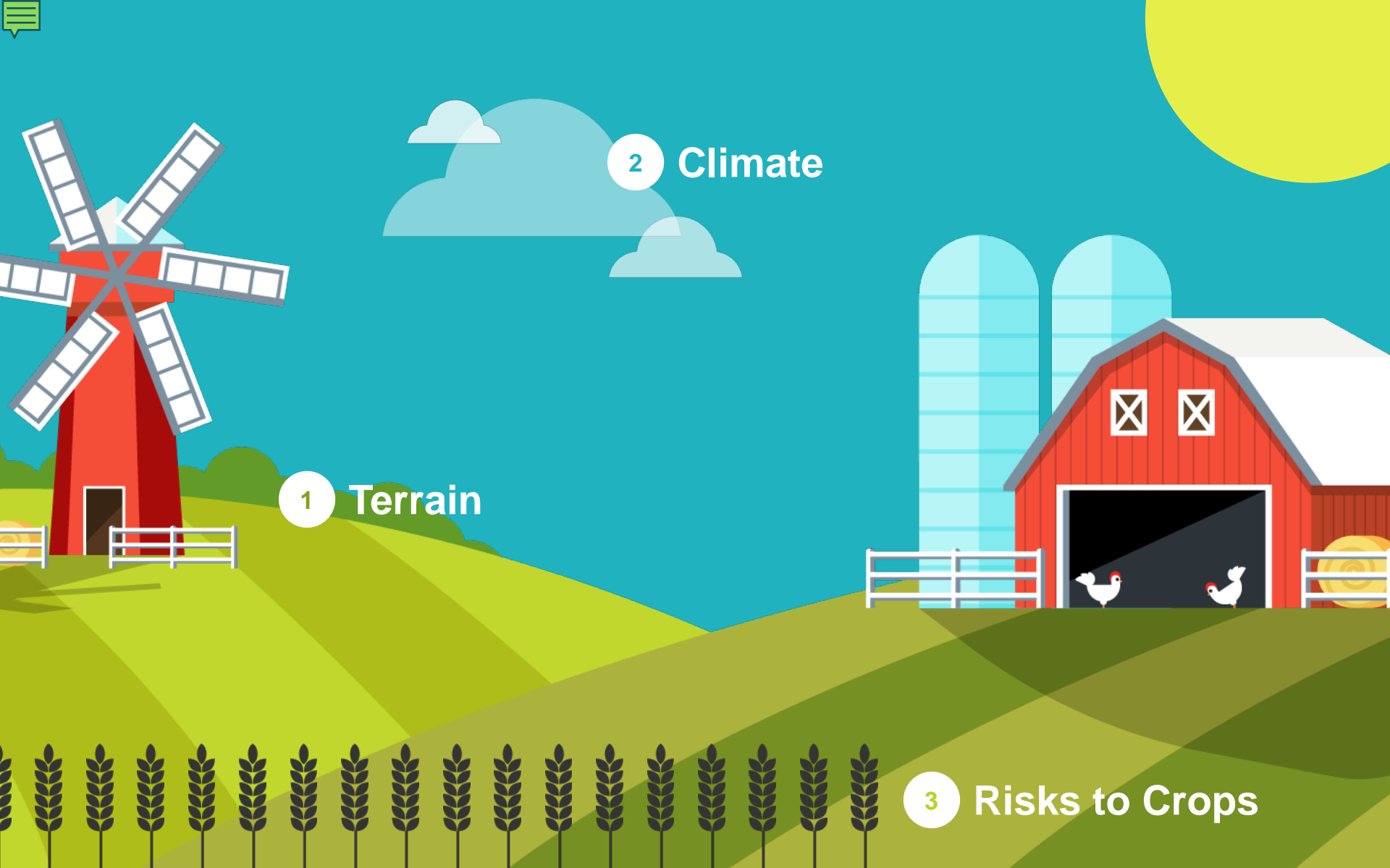


MESA



LESA/LEPA



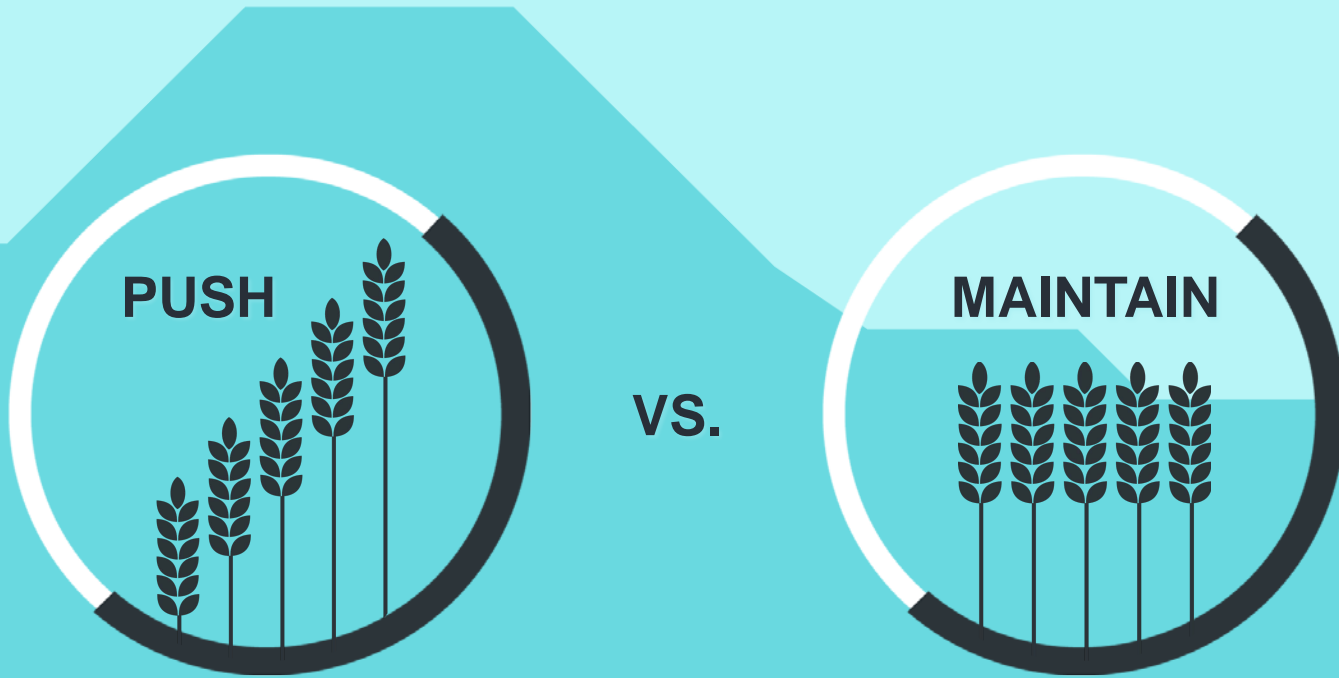


1 Terrain

2 Climate

3 Risks to Crops

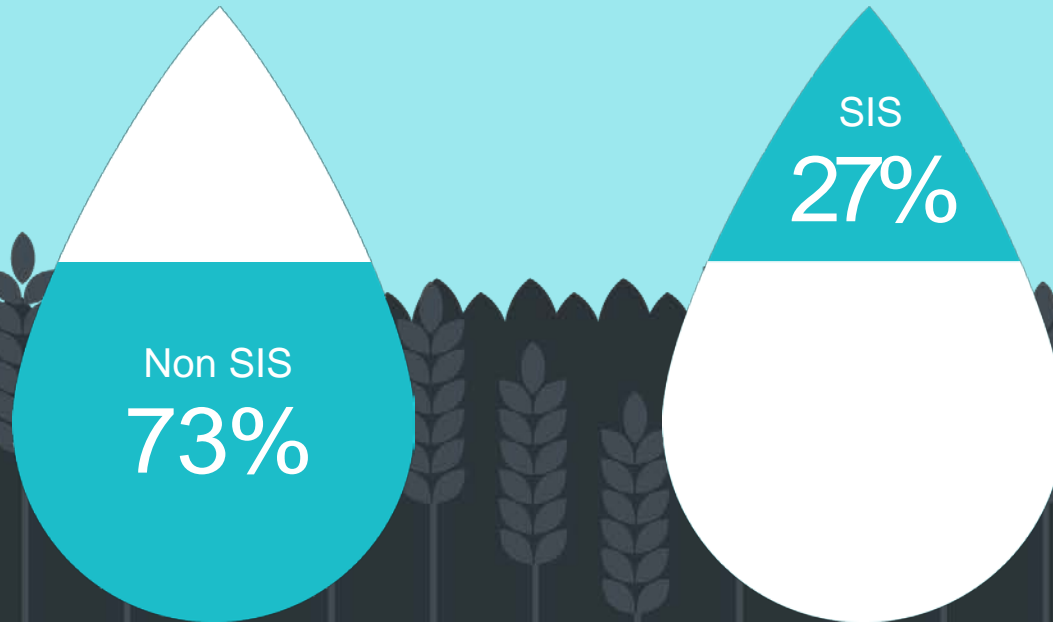
Perceived Barriers to LESA/LEPA



Strategy for Sprinklers in EE Programs



What do we know about the volume of water applied?



Scientific Irrigation Scheduling

A strategy to apply only the amount of water to the field that the crop needs



Perceived Barriers to SIS

1. Cost
2. Growers' preference to walk fields and check moisture level rather than automated.



Controls

On/Off

Direction

Constant Speed

Pump On/Off

Variable Speed Irrigation (VSI)

Variable Rate Irrigation (VRI)





Tech-savvy farm hands
and knowledgeable
agronomists required

Only cost-effective
with the right terrain

Payback is 5+ years



Perceived Barriers to VRI and VSI

What We Learned About How Water is Applied

WHEAT



BEANS



OATS



CORN

Low/Medium Intensity Management

Less Work, Less Payback

POTATOES



ONIONS



GRAPES



CARROTS

High Intensity Management

More Work, More Payback

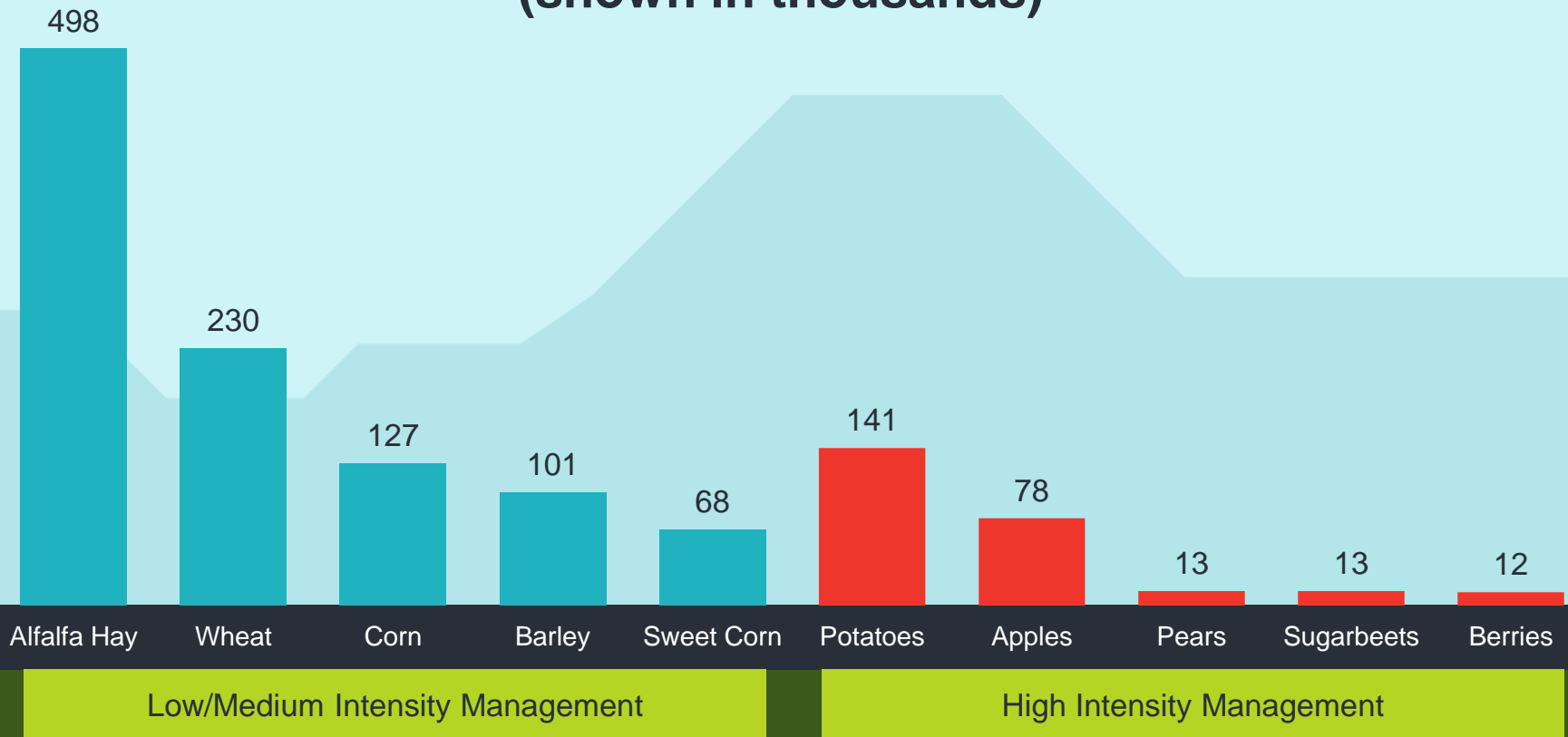


The amount of water applied matters for quality of crops





Number of Acres by Crop Type (shown in thousands)



What are the different crop types that are irrigated in BPA's territory?

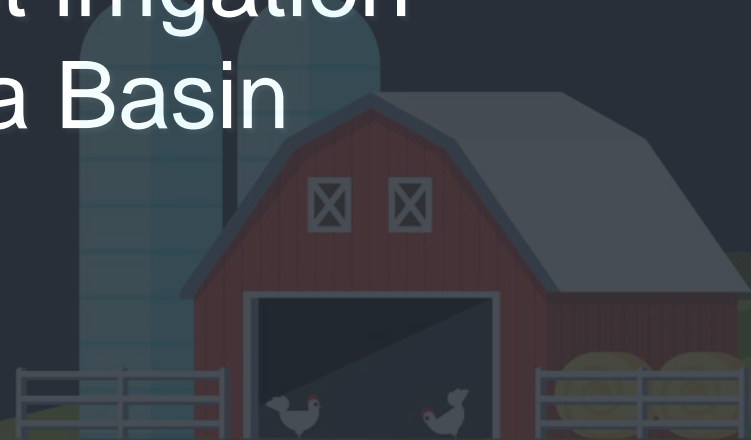


So in
summary,
we now
know...



Takeaway No. 01

Most opportunity for EE
in agriculture in BPA territory
is with center pivot irrigation
in the Columbia Basin





Takeaway No. 02

Two Types of Efficiency
for Irrigation Systems:

Pumping Efficiency

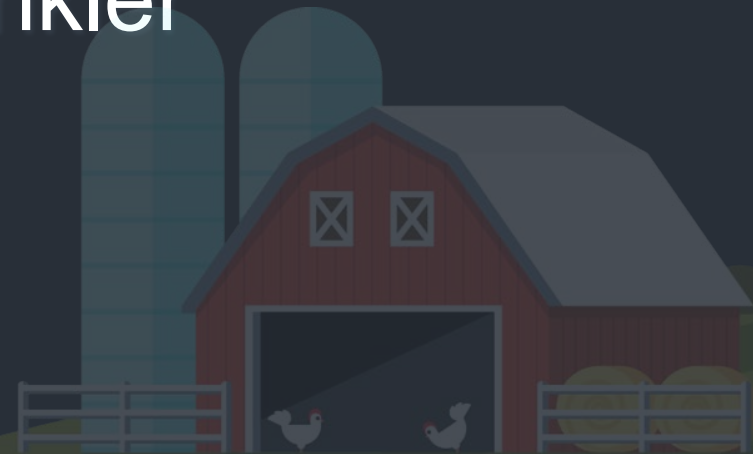
Application Efficiency





Takeaway No. 03

Market already
transitioned to more
efficient sprinkler





Takeaway No. 04

Very few growers are using
LESA/LEPA in the Columbia
Basin





Takeaway No. 05

Strategy for amount
of water applied varies
based on crop type





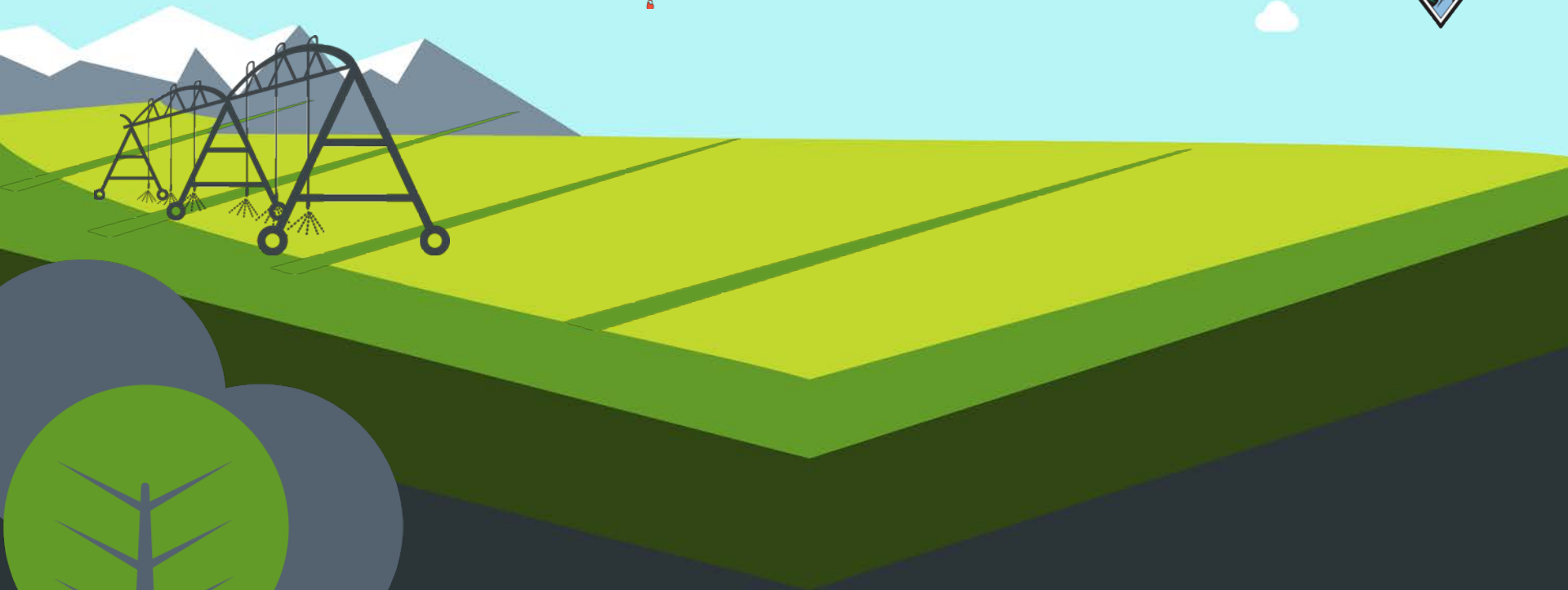
Takeaway No. 06

Push vs. Maintain





Bonnie Watson
bfwatson@bpa.gov
503.230.3693



Part 2: Ag Irrigation Market Opportunities

December 13, 2016

10:00 - 11:30 am



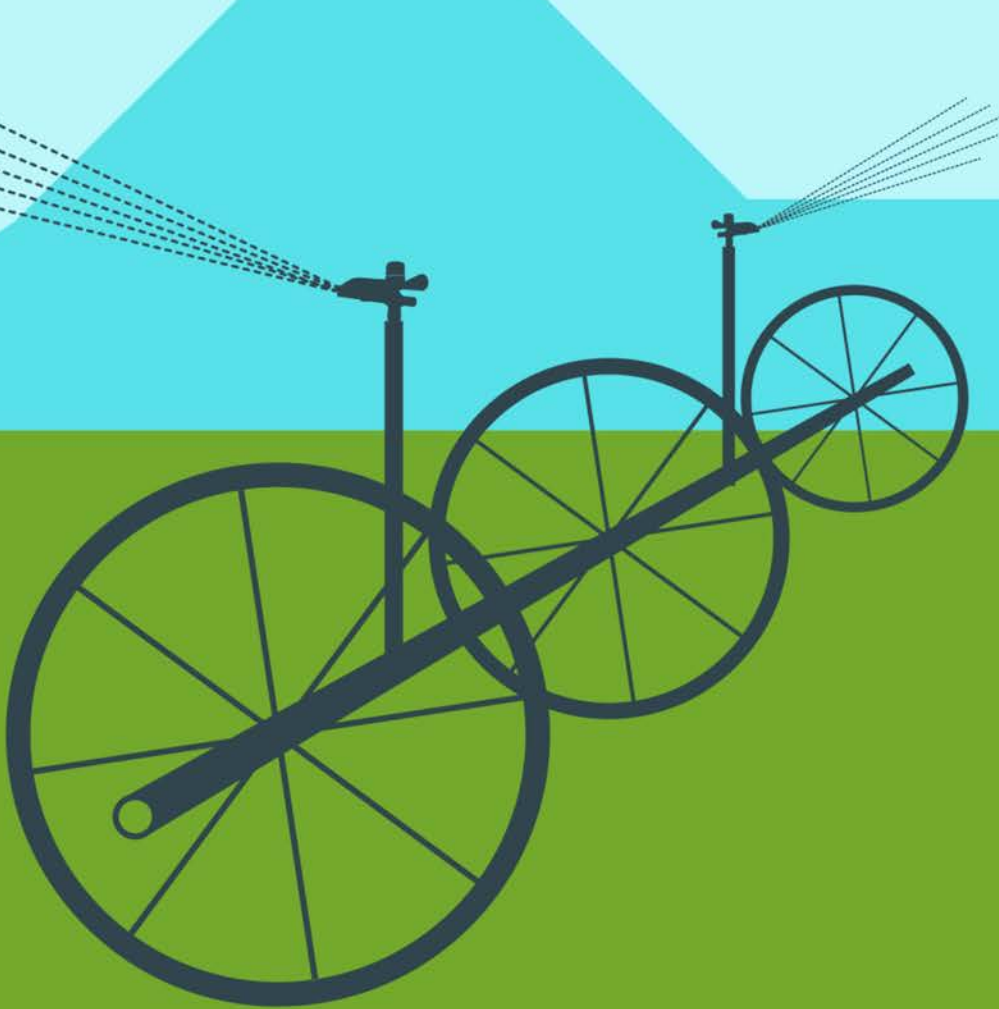
Appendix: Types of irrigation systems in BPA territory



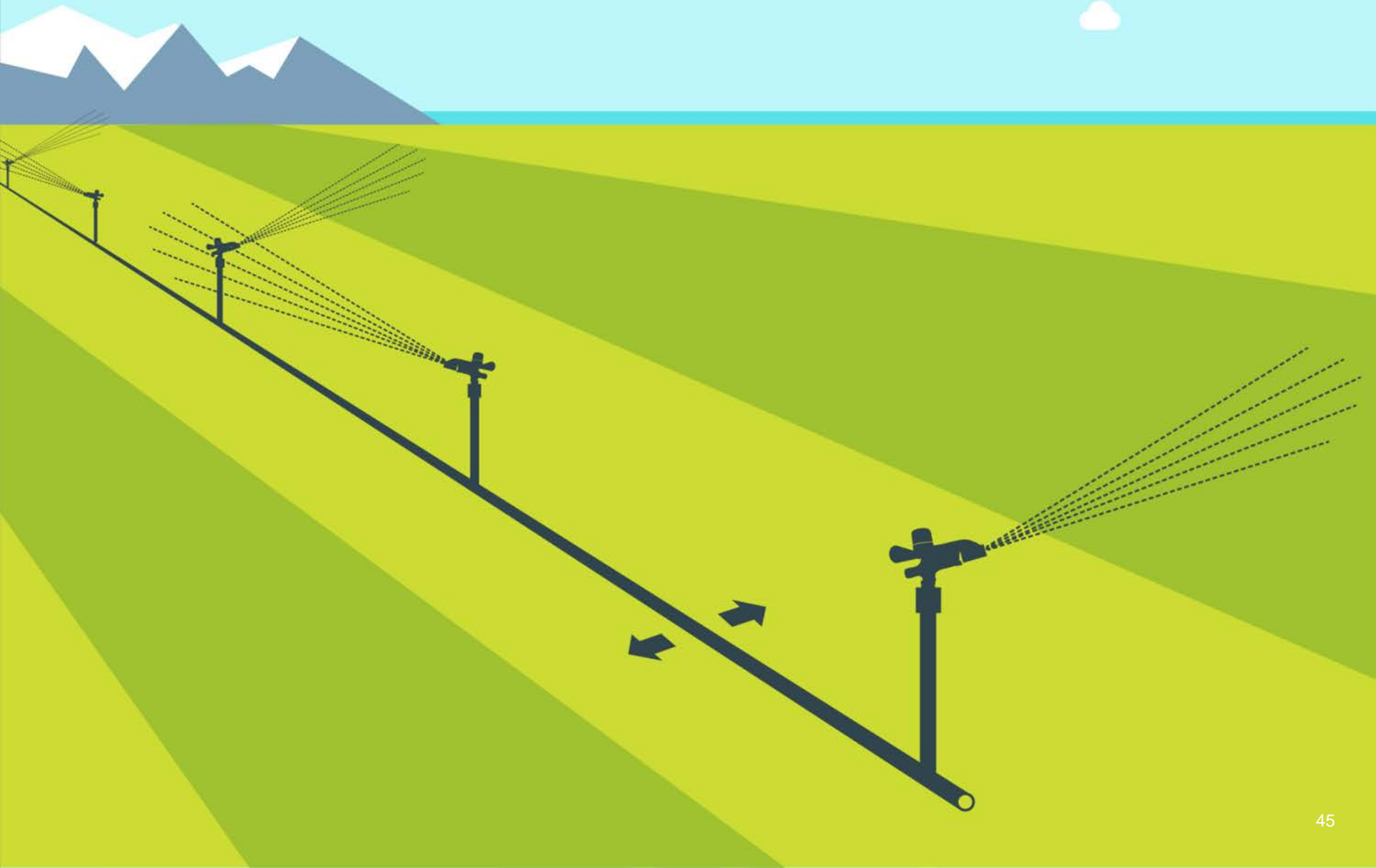
Center Pivot



Wheel Line



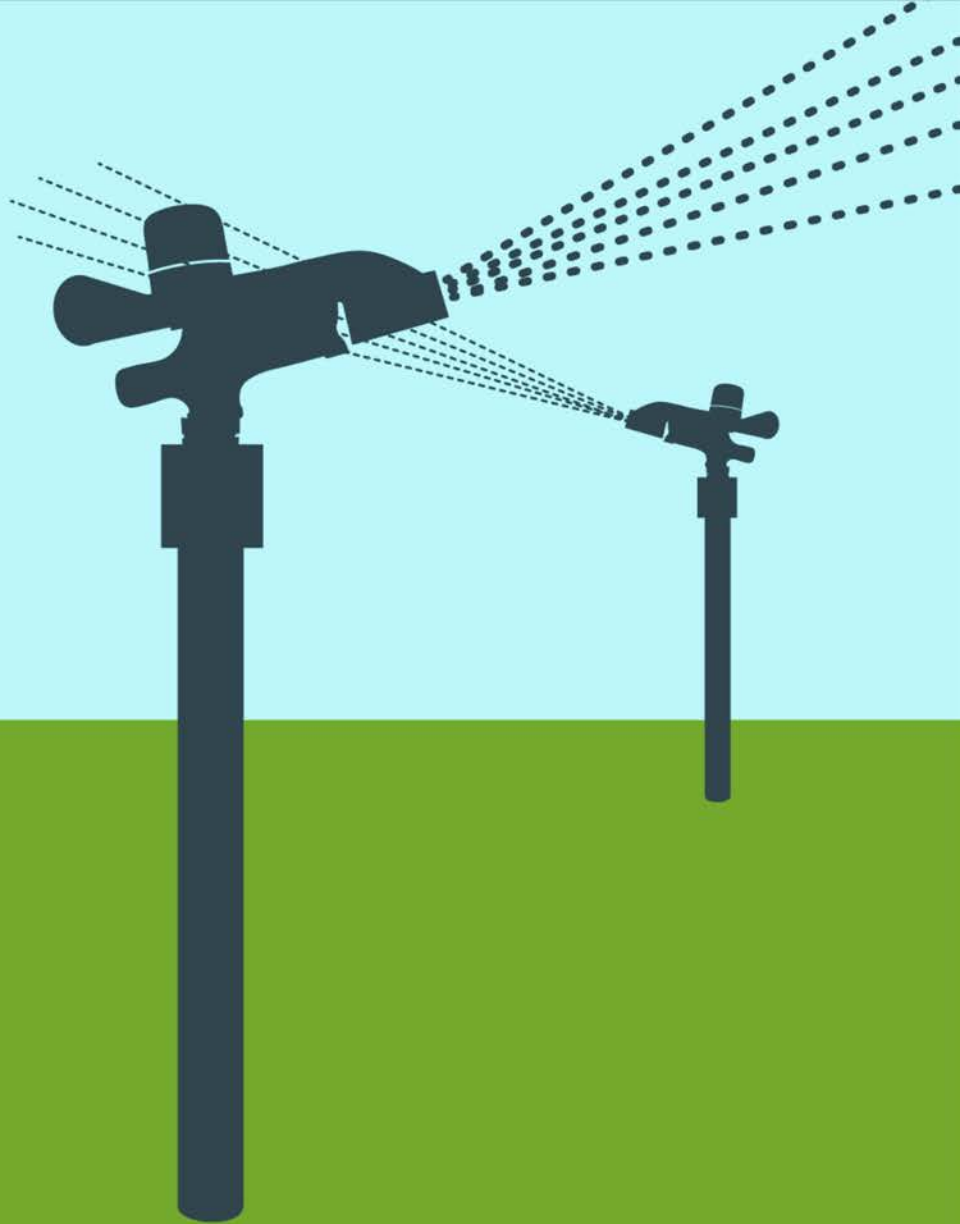
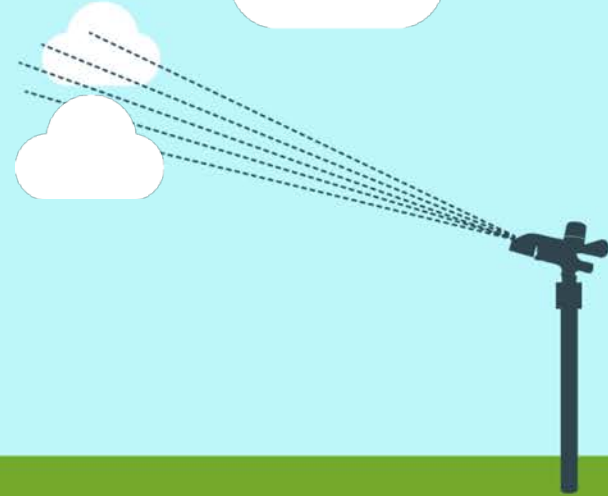
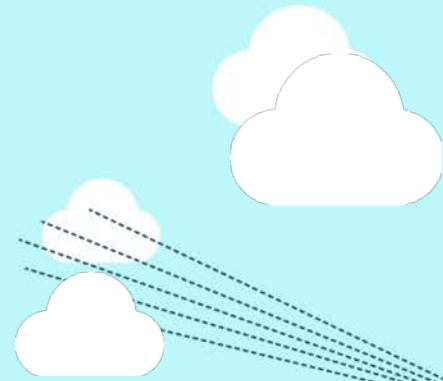
Hand Move





Drip System





Solid Set