

# Climate risk in agriculture: Questions from the finance sector

CRSPI presentation

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# Who we are

Energetics works with  
Australia's governments and  
ASX200 businesses on  
strategies to address climate  
change

# Our clients

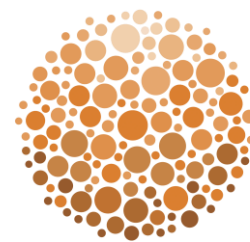






# Operating context and background





# Introduction

The G20 Financial Stability Board (FSB) Taskforce on Climate-related Financial Disclosure (TCFD) is a private sector led, policy neutral working group, that has developed a set of recommendations on climate related disclosure.



**Figure 1: TCFD's core recommendations**

Released in June 2017, TCFD has 11 recommendations broken into four broad topics.

# Introduction: current state of risk assessment in Australia



## Climate risk disclosure by Australia's listed companies

September 2018

### Annual reports: What did ASIC find?

“Our review also indicated that many disclosures were too general and not comprehensive enough to be useful for investors.

For example, isolated, high-level statements such as (the paraphrased) ‘*we have considered the impacts of climate change on our business*’ do not provide investors with any meaningful insight as to the depth or extent of that consideration.”

### Prospectuses: What did ASIC find?

*“We found limited examples of companies explicitly citing and disclosing climate risk (either physical or transition) as a relevant risk factor. None of the prospectuses we reviewed expressly identified any physical climate risks.”*





# Key questions from the finance sector



# Questions being asked by the finance sector



- What is the **chronic and acute physical climate change risk** to our agriculture portfolio?
- What impact will the physical risk of climate change have on:
  - Our **customers**:
    - What impact will have on their **productivity? Revenue?**
    - What **adaptative technologies/practices** are available? What **investment** is required?
  - Regions of operation:
    - How will this differ by **region**?
    - What is the future world view?
  - Our business
    - Impact on **risk profile, profitability and reputation**
    - Regulatory considerations

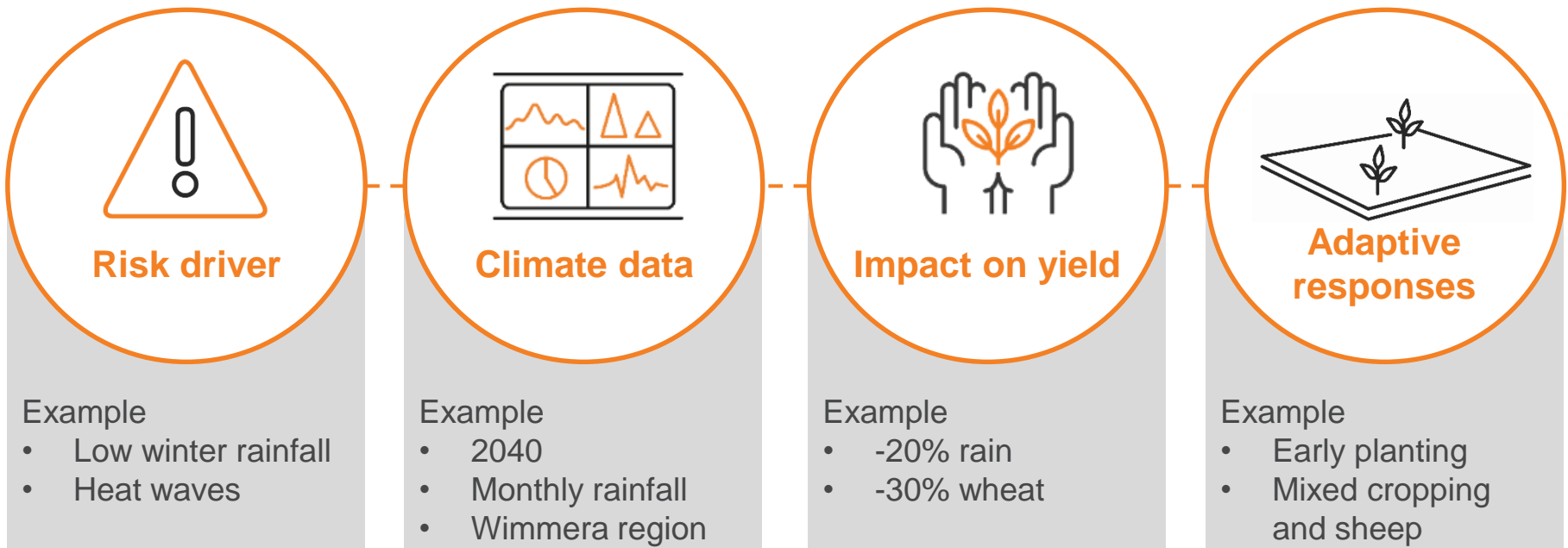


## Our approach

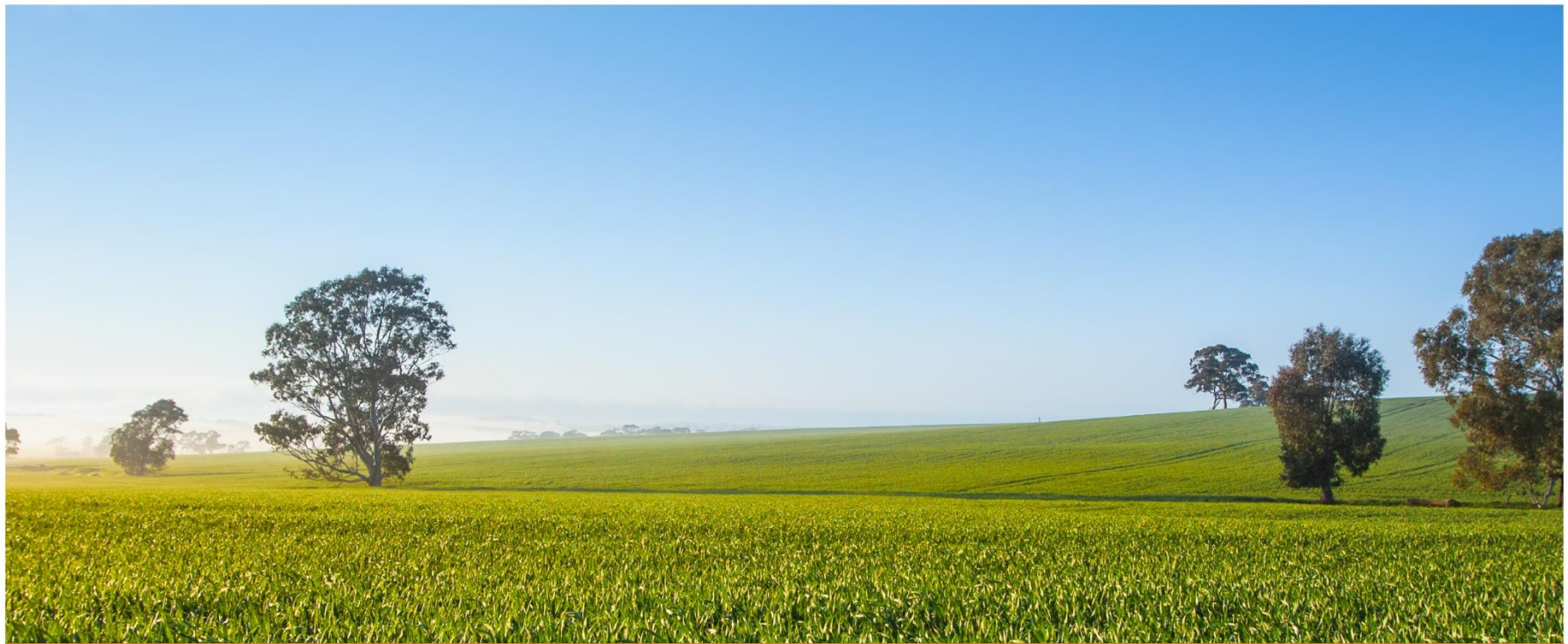




# Our approach







For example – grains and oilseeds



energetics



# For example: Grains and oilseeds

## Key drivers



### Temperature

- Growing season temperature increase
- Threshold measures  $>32^{\circ}\text{C}$  (Heatwave frequency and length increase)
- Frost increase or decrease



### Rainfall

- Growing season rainfall:
  - April – October
  - November – March (Northern)
- Drought frequency and length increase



### Other

- Fire frequency and intensity



# Grains and oilseeds

## Chronic



Climate driver	Parameter for assessment and comments	Data availability
<b>Growing season rainfall decrease</b>	Key driver, granular data	
Lag season rainfall decrease	Data not available for lag season	
<b>Growing season temperature increase</b>	Key driver, granular data	
Irrigation water availability	Limited data available, qualitative assessment focusing on policy	
Evaporation and wind speed	Secondary driver, granular data	
Increased CO2	Not available, more conservative not to include positive effect	
Loss of biodiversity	Qualitative assessment	
Sea level rise	High level quantitative assessment, coastal cropping land is limited	

Availability	5 km grid, 30 year average on 5 year time step	5 km or 100 km grid, 30 year average on 20 year time step	Direction and magnitude of change	Direction of change	Limited available
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# Grains and oilseeds

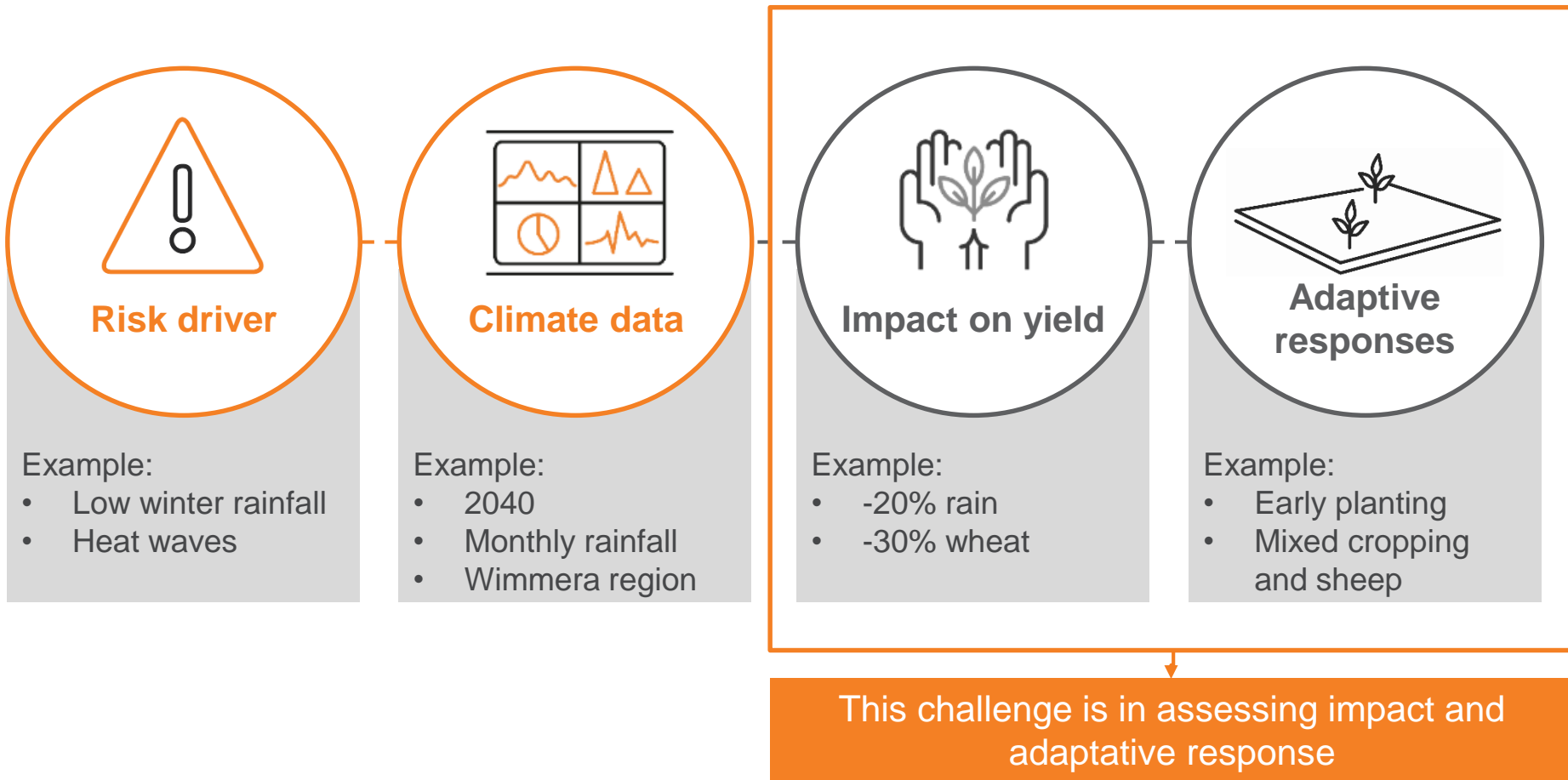
## Acute



Climate driver		Parameter for assessment and comments			Data availability
Pests and diseases		Qualitative assessment			
<b>Extremely hot day frequency</b>		Threshold analysis is available at a granular level			
<b>Drought frequency and length increase</b>		Insights into future impacts by combining past impacts and future magnitude and direction of change			
<b>Extremely cold day/night frequency</b>		Threshold analysis is available at a granular level			
<b>Fire frequency and intensity increase</b>		Insights into future impacts by combining past impacts and future direction of change			
Rain at harvest		Analysis of impact on quality			
Flooding frequency and intensity increase		Insights into future impacts by combining past impacts and future magnitude and direction of change			
Storm frequency and intensity increase		Insights into future impacts by combining past impacts and future direction of change			
Local storm phenomena (hail, lightning, wind-gusts, heavy rain)		Data not available, regional percentage increase in intensity of daily total rain available for a high level analysis			
Availability	5 km grid, 30 year average on 5 year time step	5 km or 100 km grid, 30 year average on 20 year time step	Direction and magnitude of change	Direction of change	Limited available

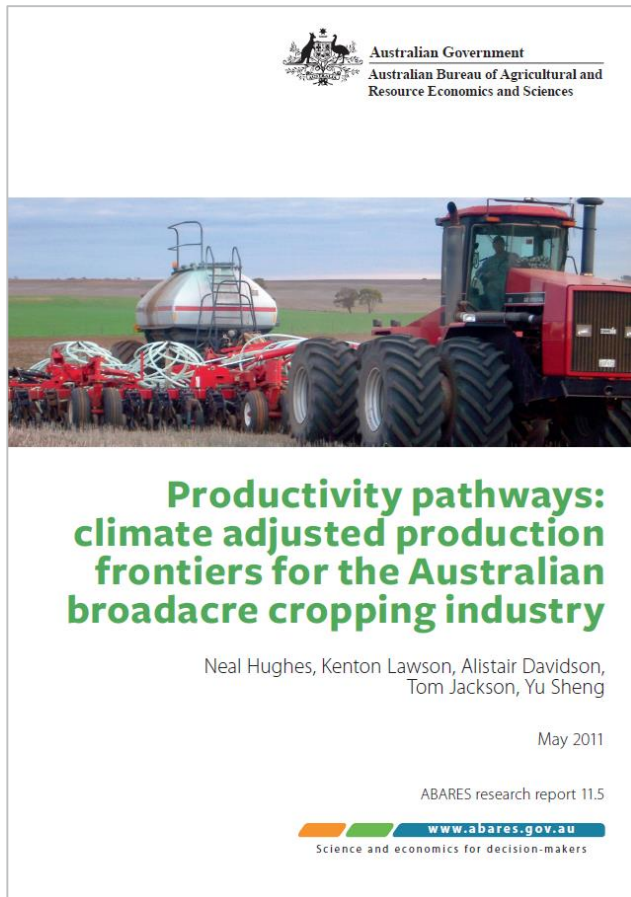


# Process: Commodity assessments

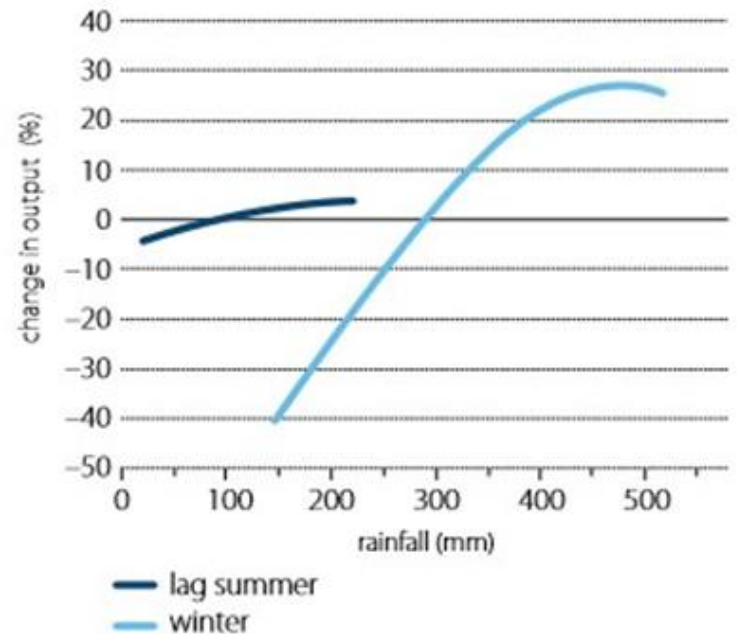


# Impact on yield

## No mitigation



### 9 Effect of winter and lagged summer rainfall on output in the western region (model 2)



Note: Range is 2.5 percentile to 97.5 percentile of farm winter and summer rainfall; the mean winter rainfall is 290 mm and the mean summer rainfall is 90 mm

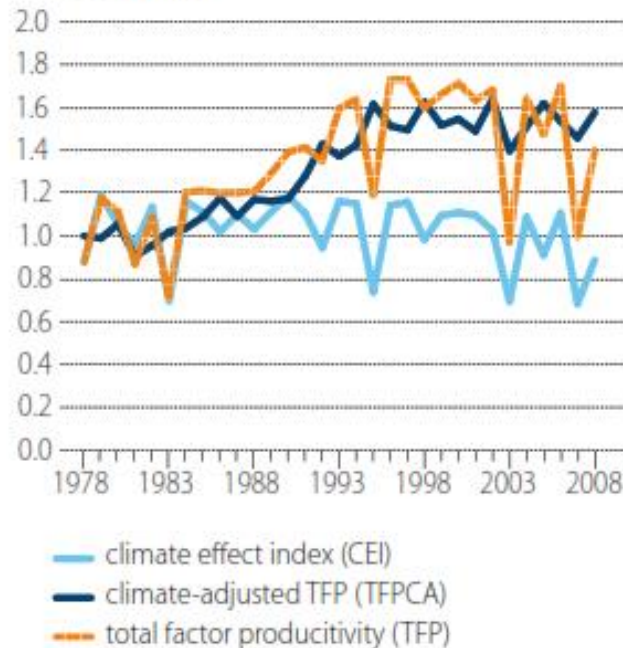


# Impact on yield

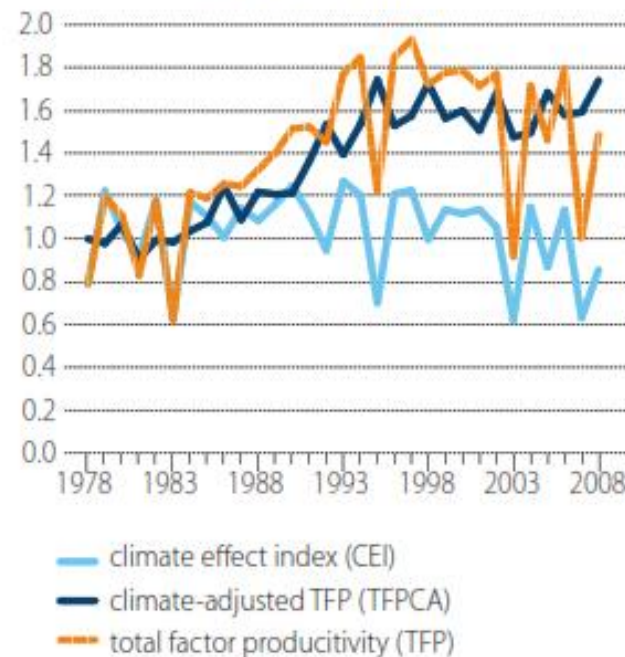
## In context



**16** Average climate adjusted TFP for all cropping farms, 1977-78 to 2007-08



**17** Average climate adjusted TFP for cropping specialist farms only, 1977-78 to 2007-08





# Adaptive response options

## APPROACH 1



**Stop**

## APPROACH 2



**Alter current practices**

Incremental adaptation  
Small adjustments to farming operations keeping the essence of the current management system in place

## APPROACH 3



**Do something different**

Transformational adaptation  
Major and non-marginal changes to farming management systems to address climate change risks

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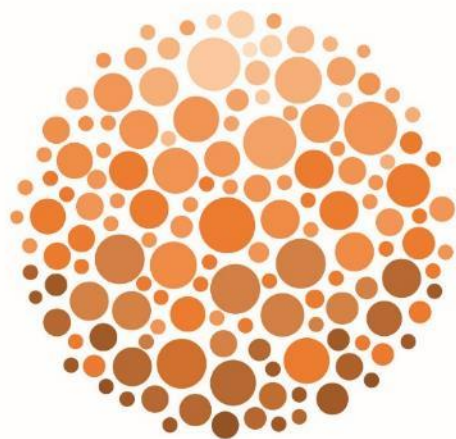
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