

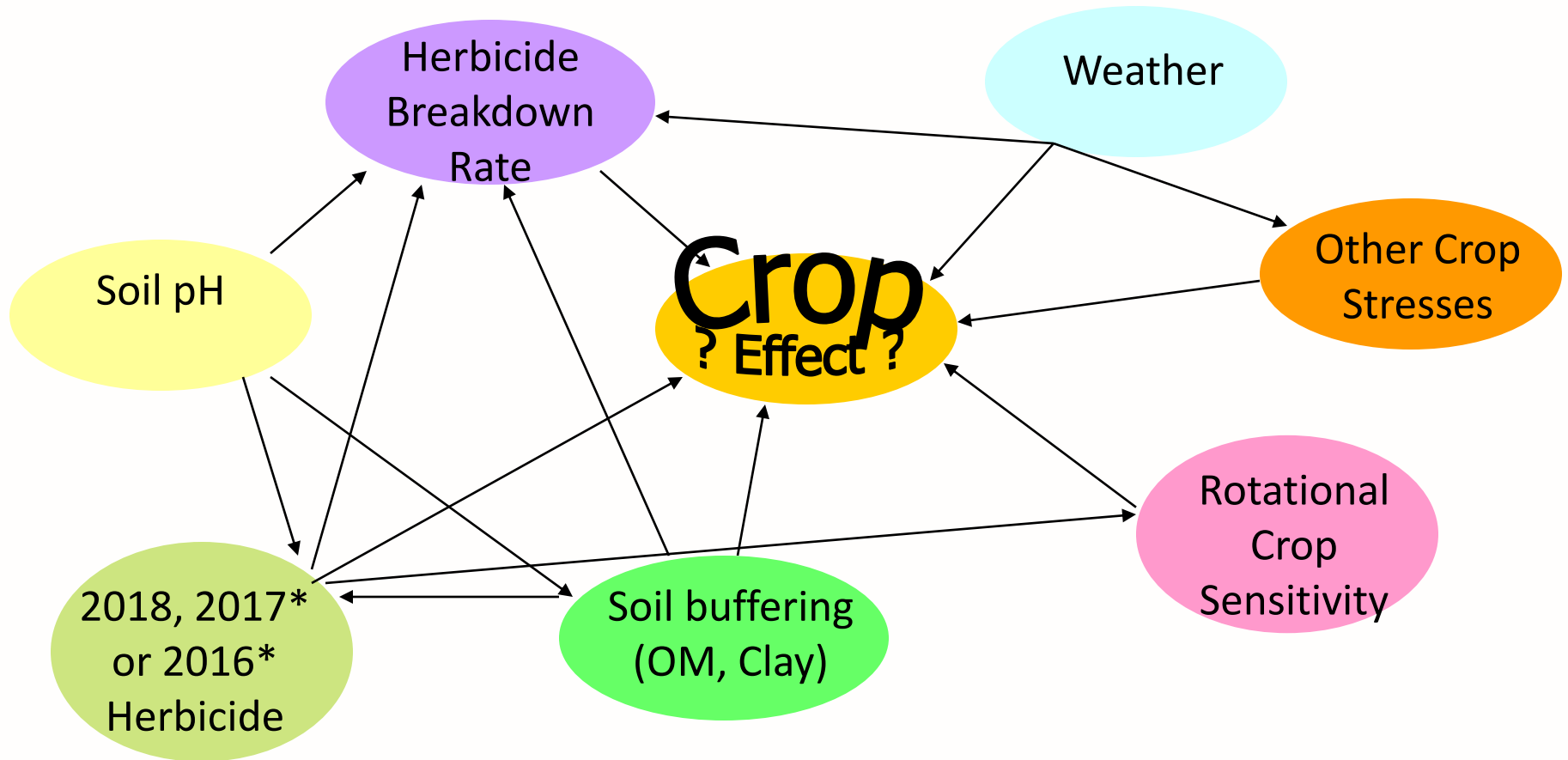
Herbicide Carryover following Dry Conditions

Cory Jacob, PAg

Crops Extension Specialist

Saskatchewan Ministry of Agriculture

Will herbicide carryover affect my crops in 2019?



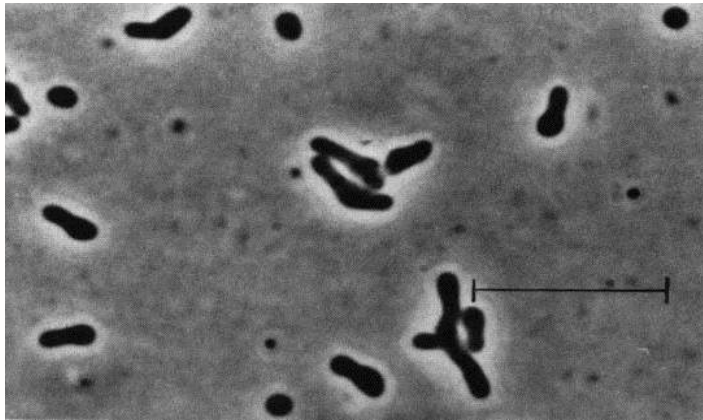
* In cases where herbicide recropping restrictions cover a two year timeframe

Herbicide Persistence

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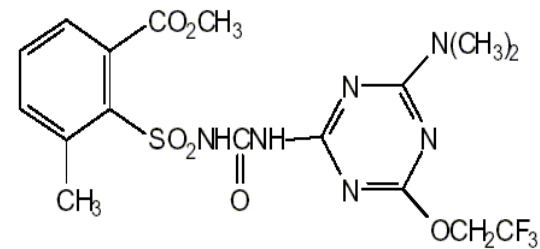
Microbial activity

- major route of decay of most products
- Requires soil moisture



Chemical Hydrolysis

- plays important part in decay of Groups 2 & 5
- Requires soil water for chemical activity to take place



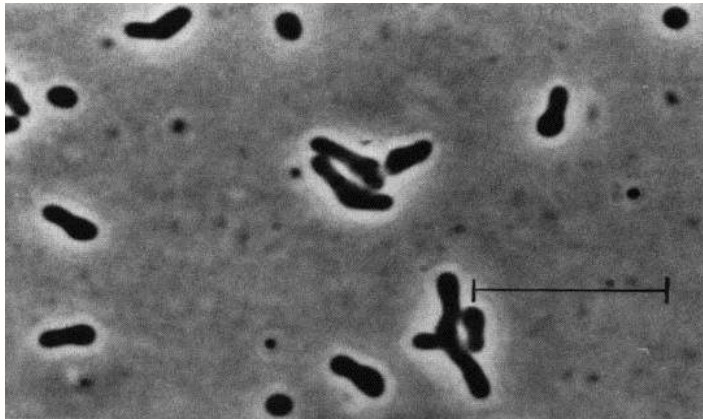
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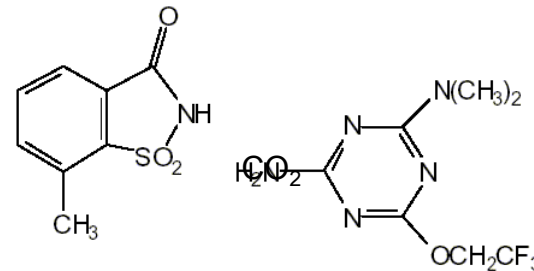
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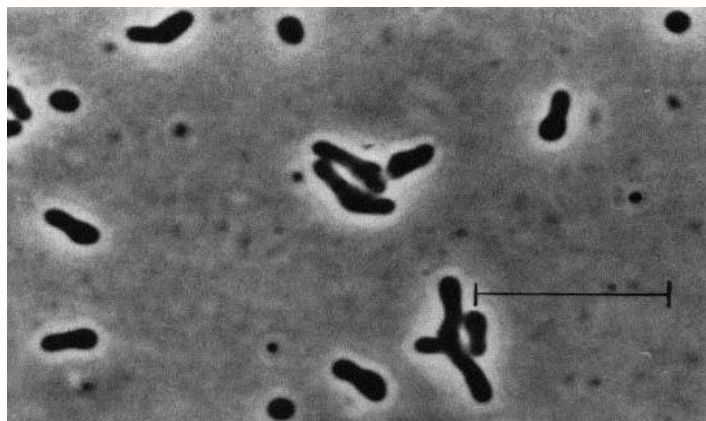


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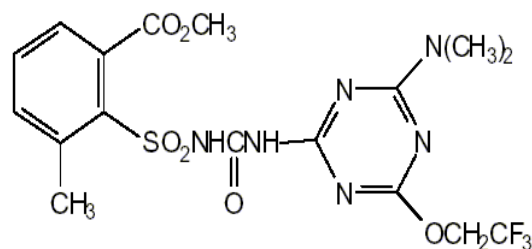
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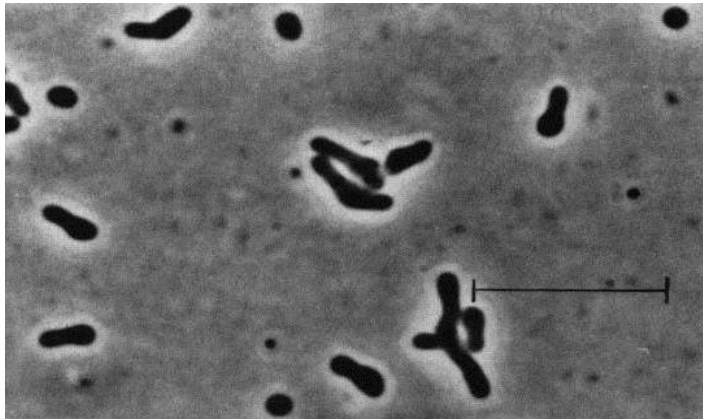
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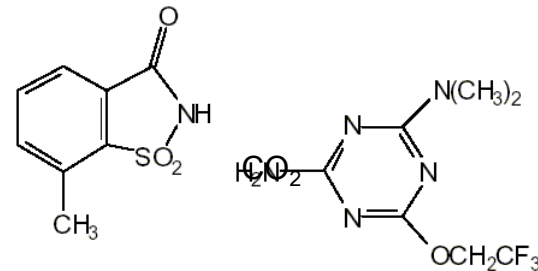
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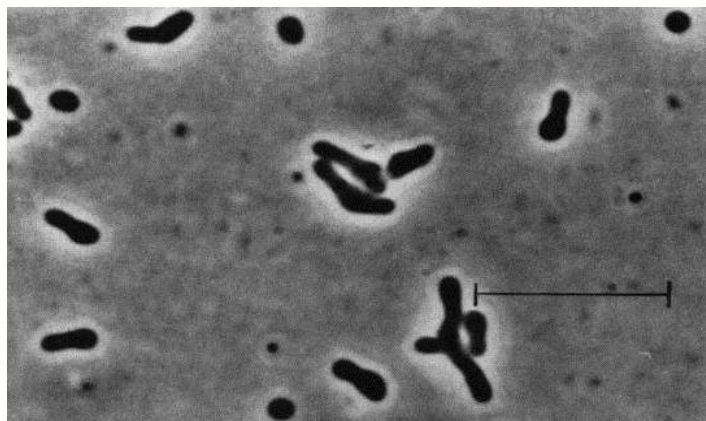


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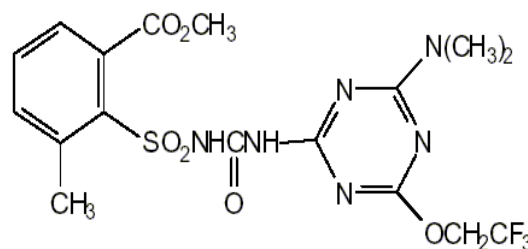
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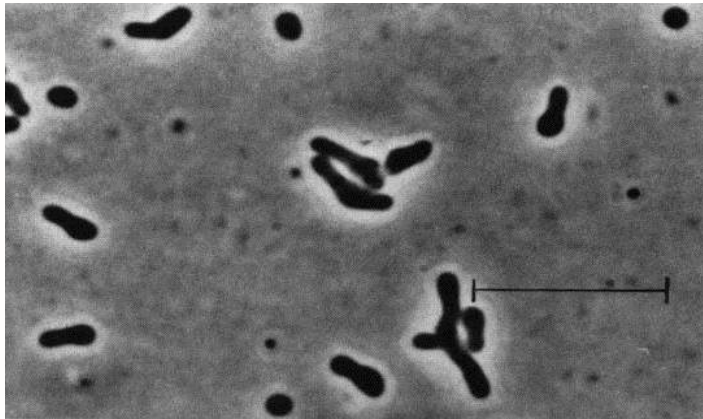
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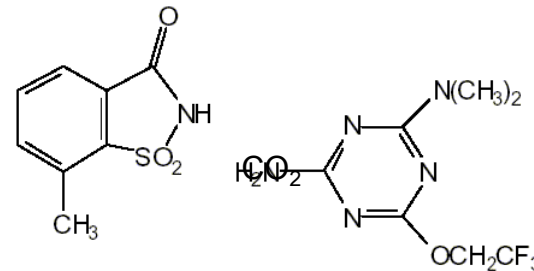
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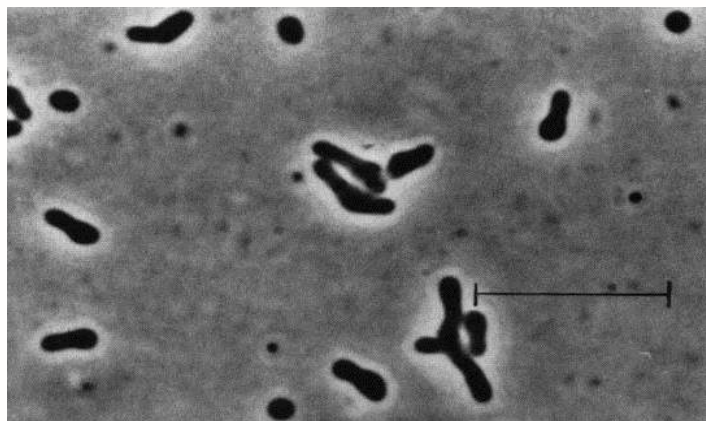


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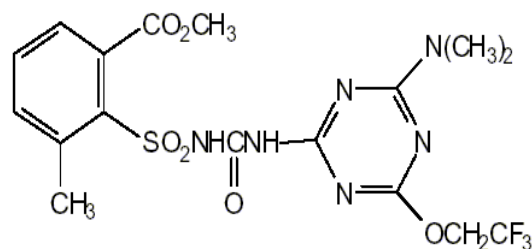
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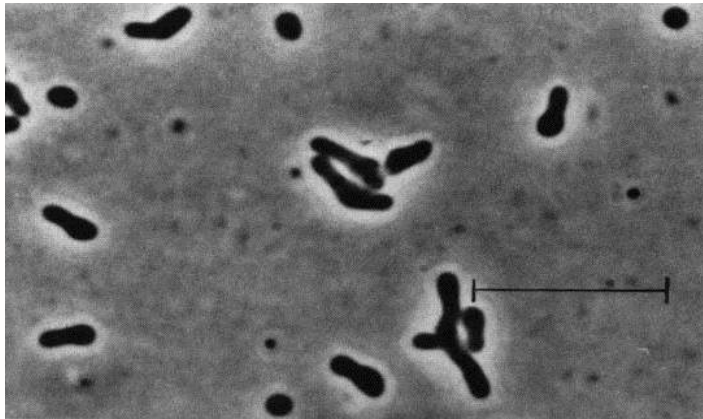
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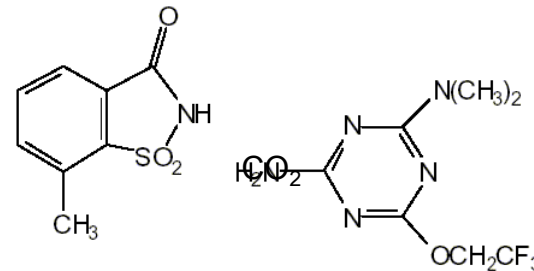
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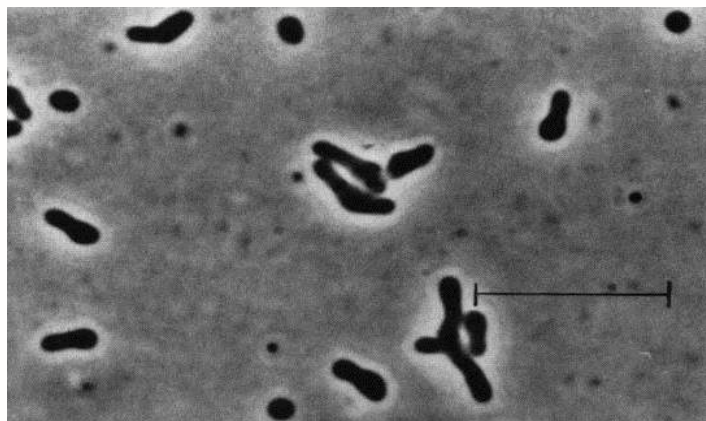


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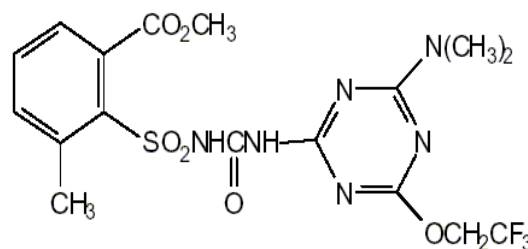
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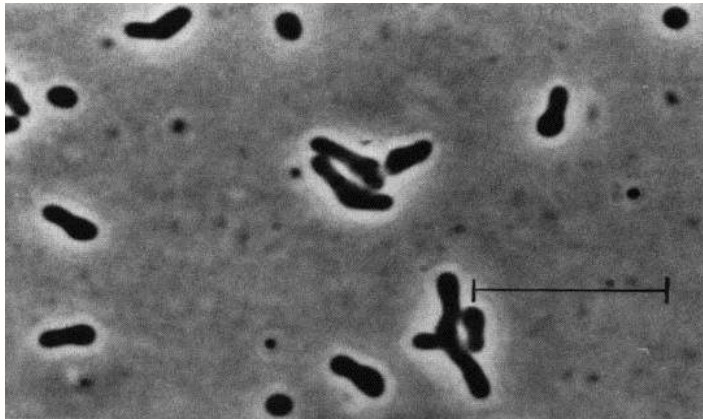
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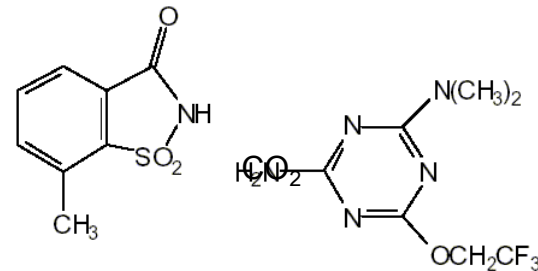
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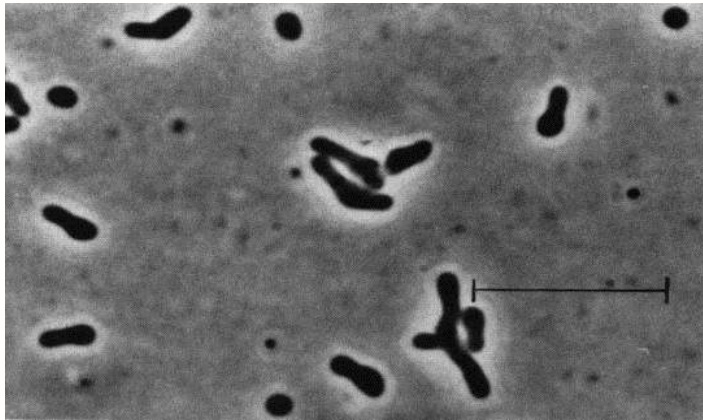


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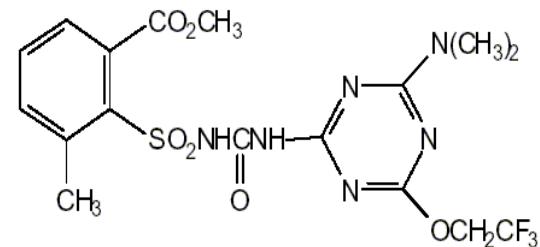
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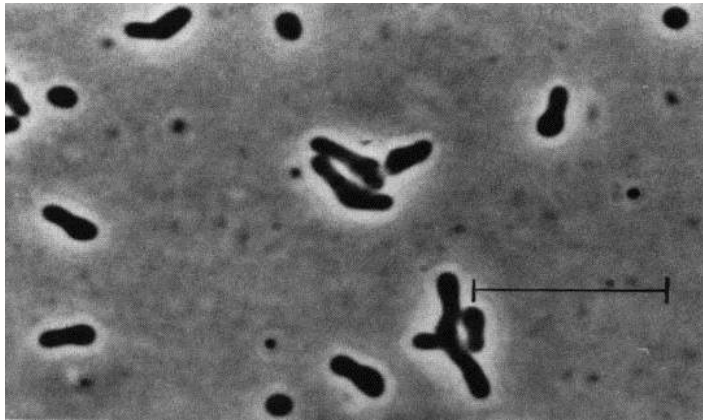
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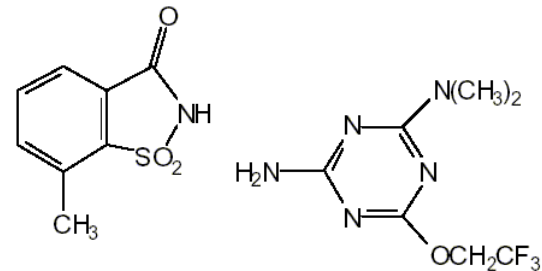
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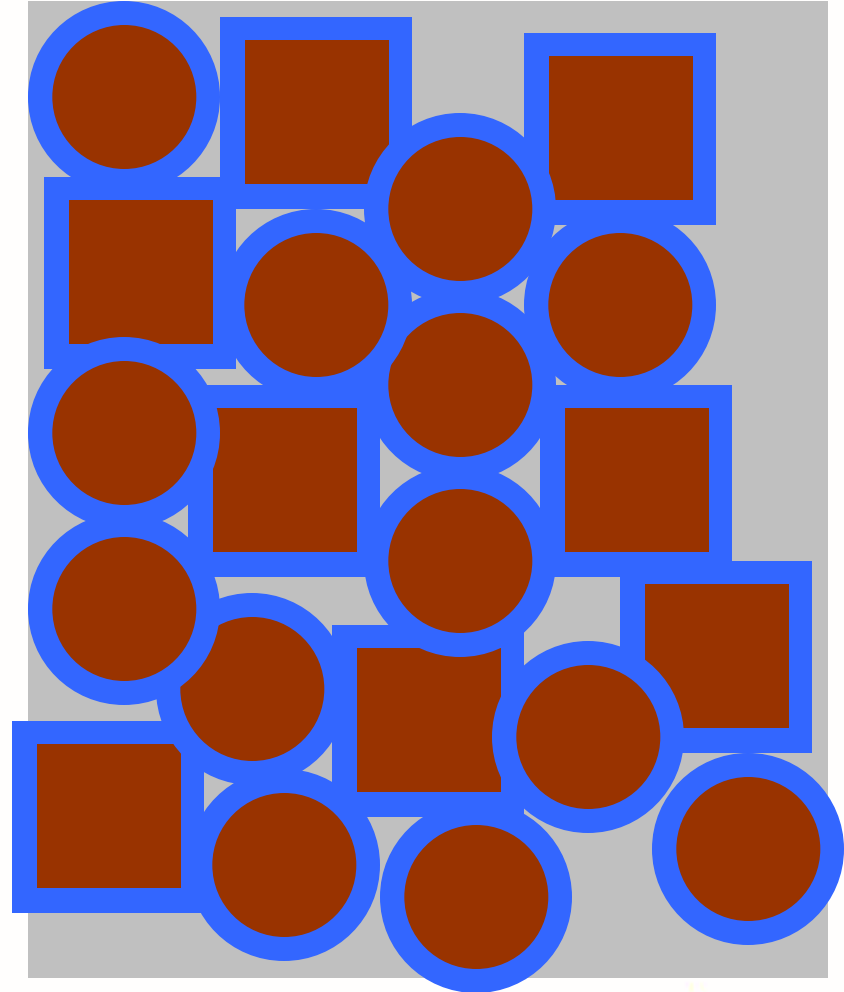
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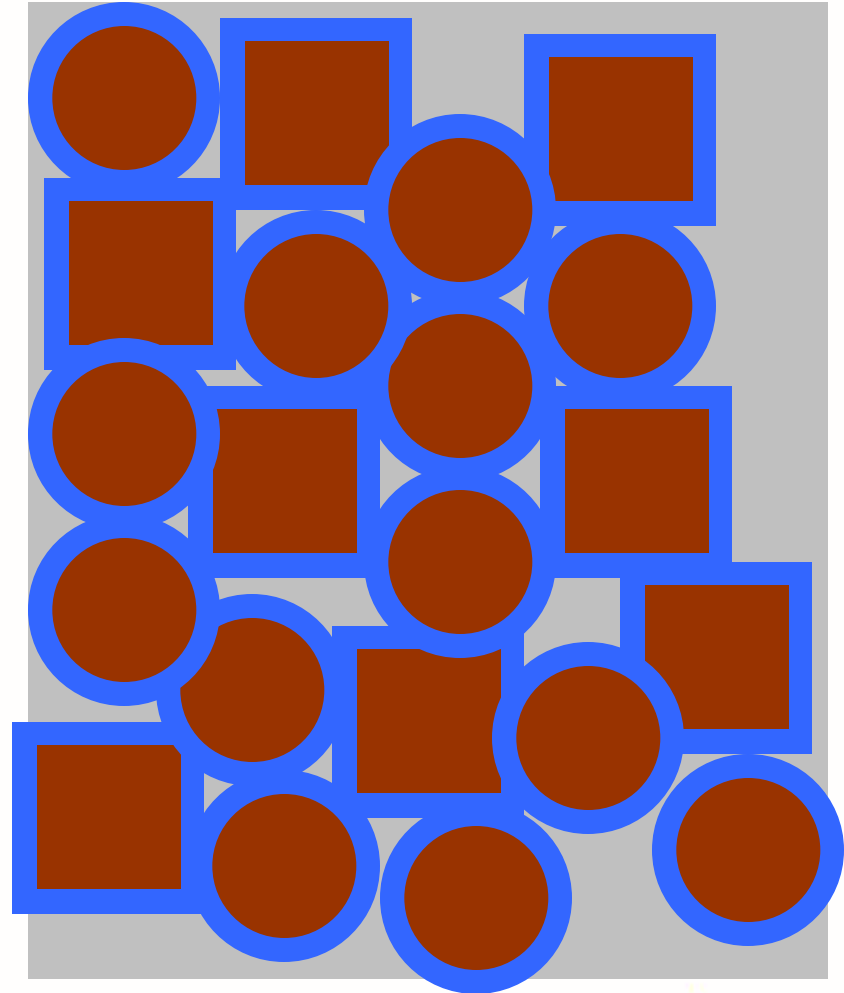
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 - Determines amount of free product available for both plant and microbe use - can inhibit decay process
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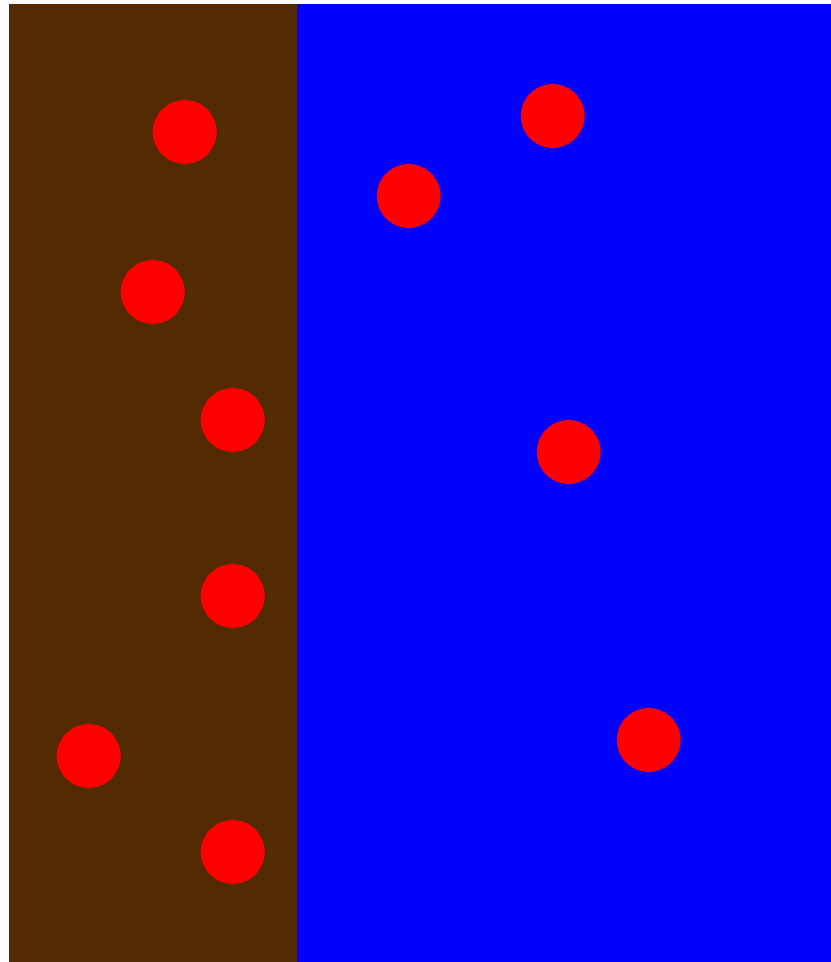
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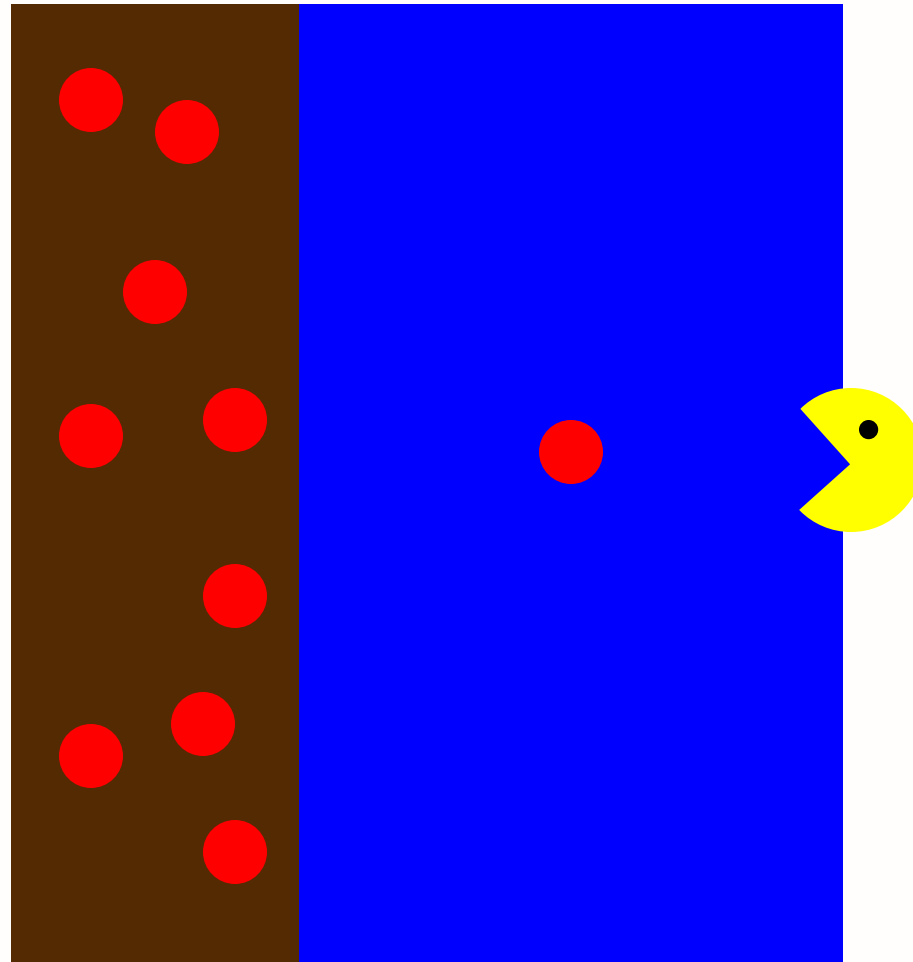
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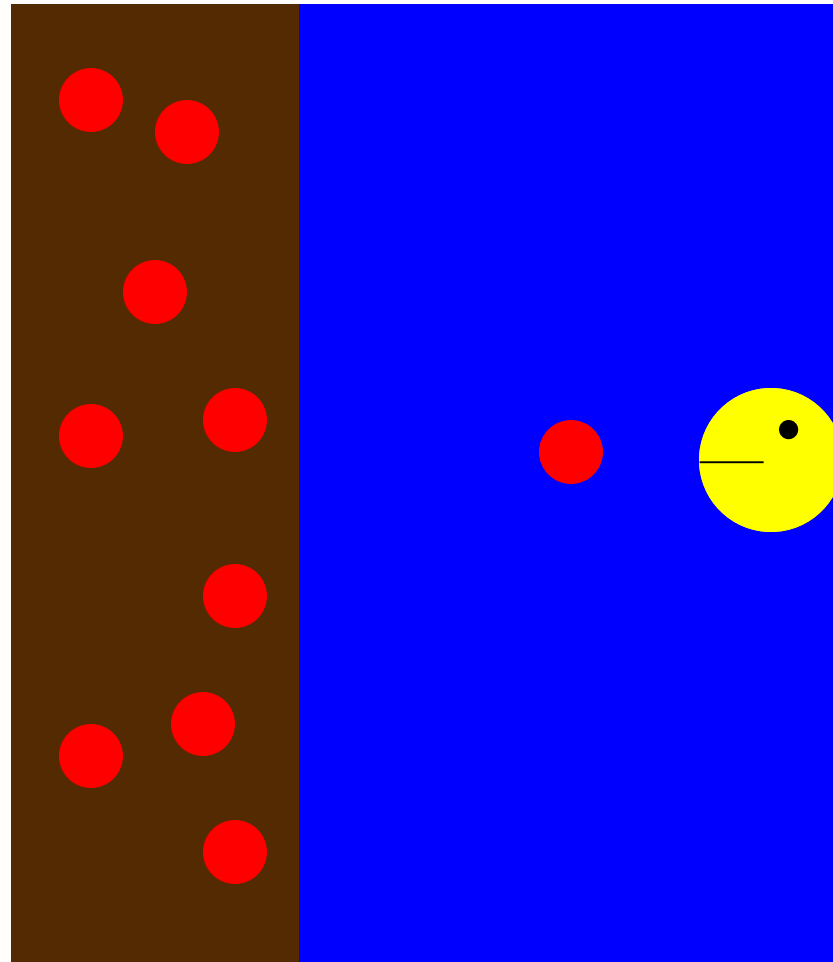
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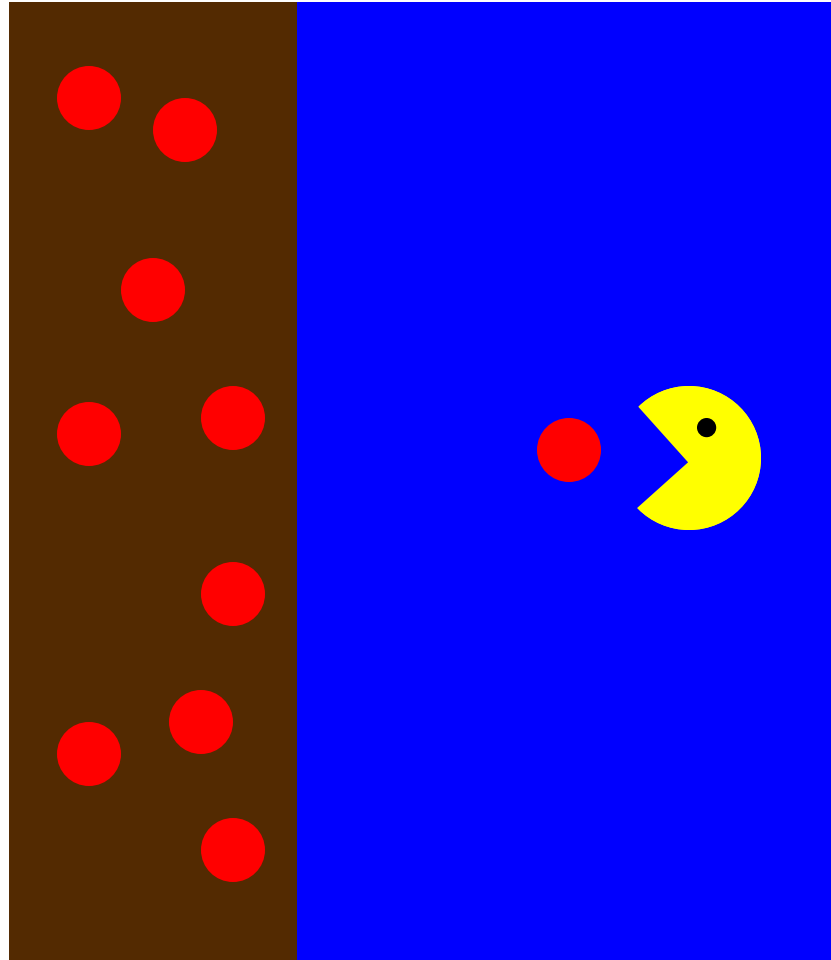
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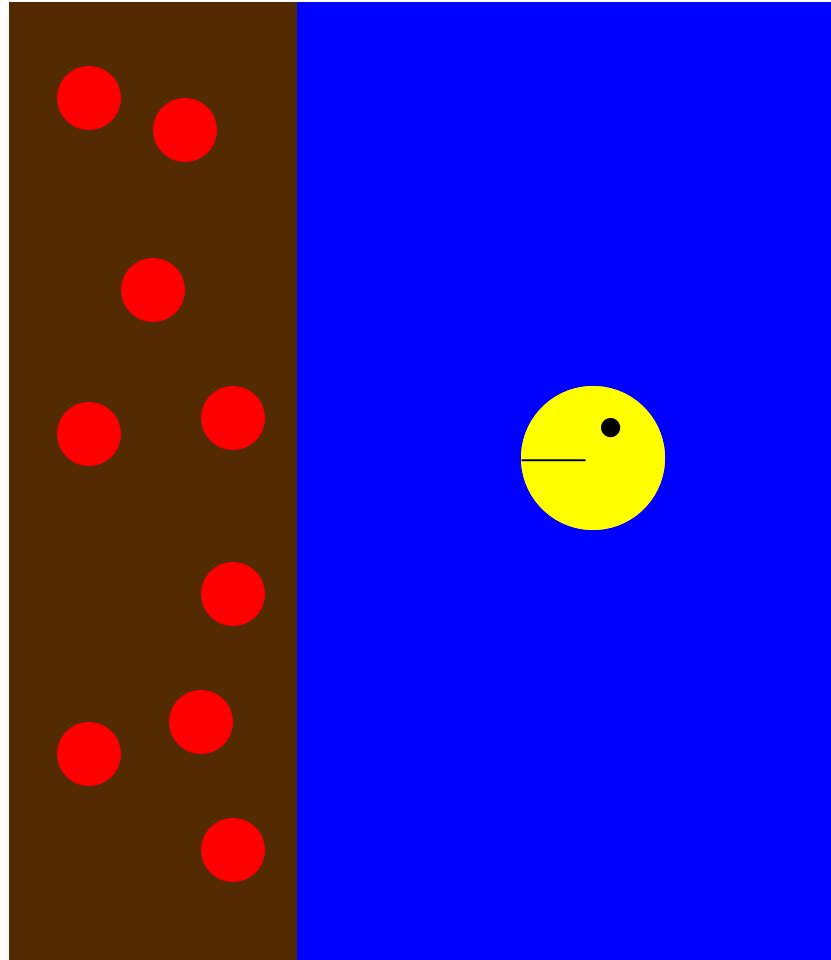
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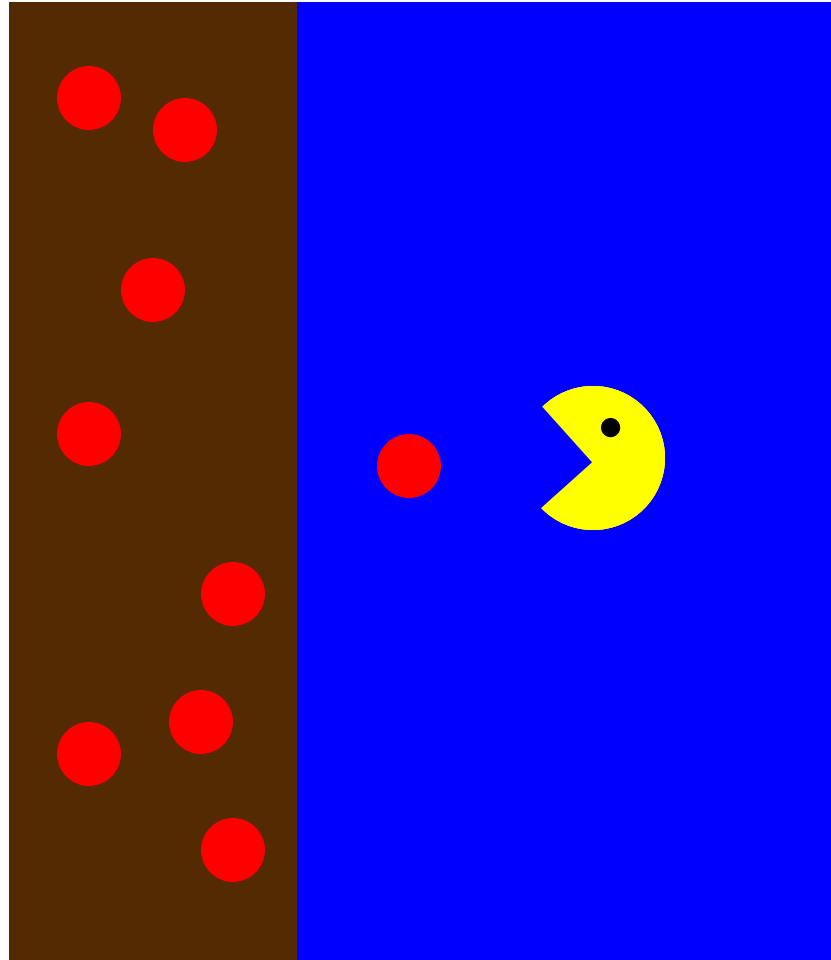
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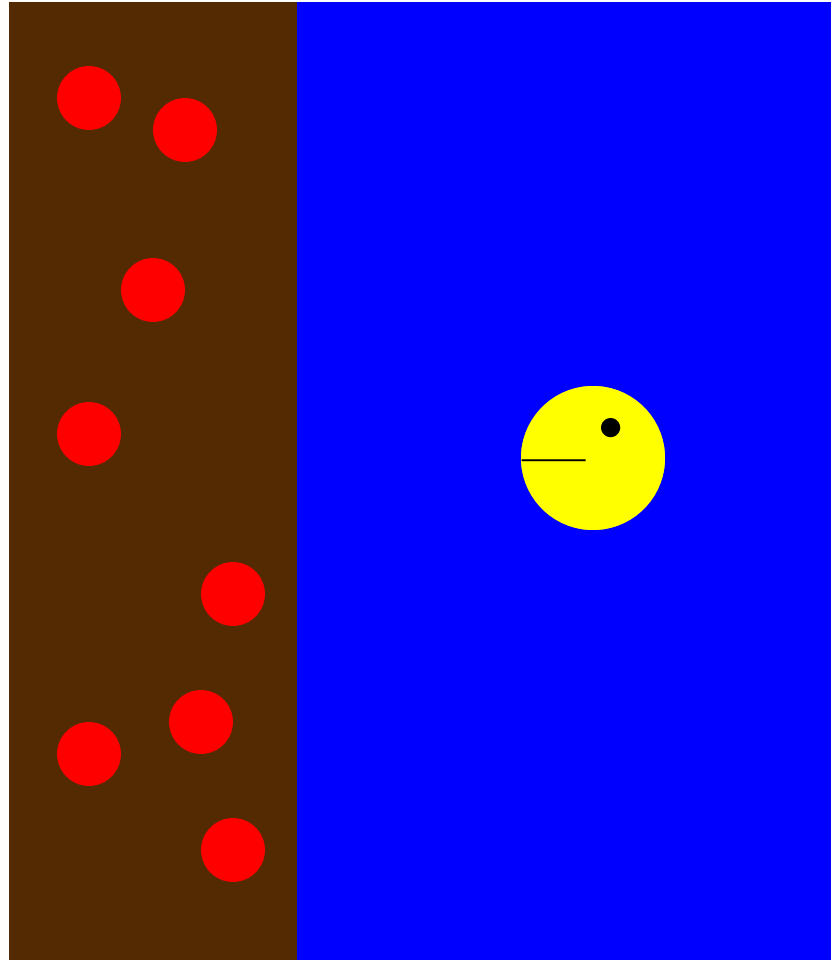
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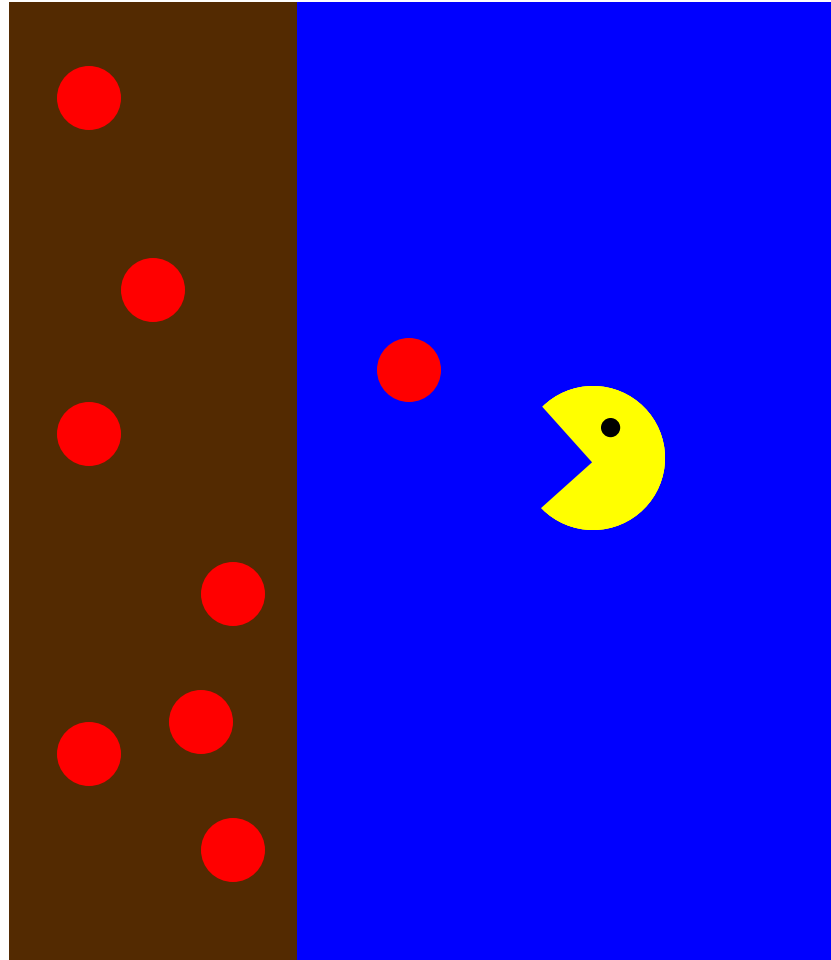
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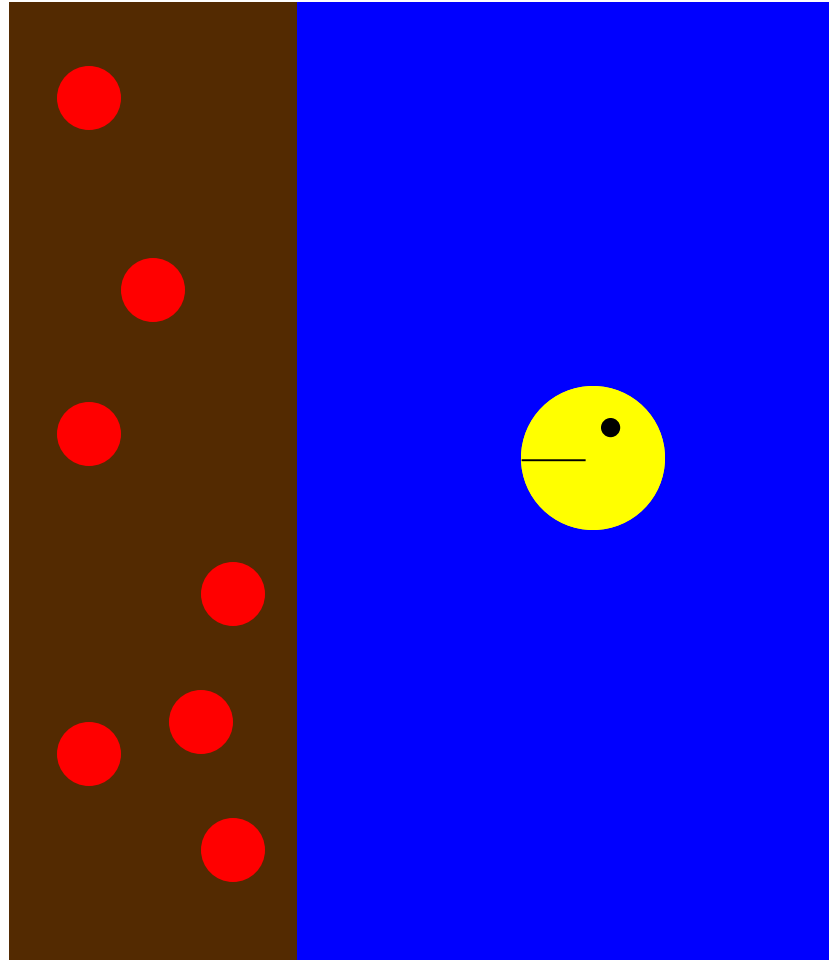
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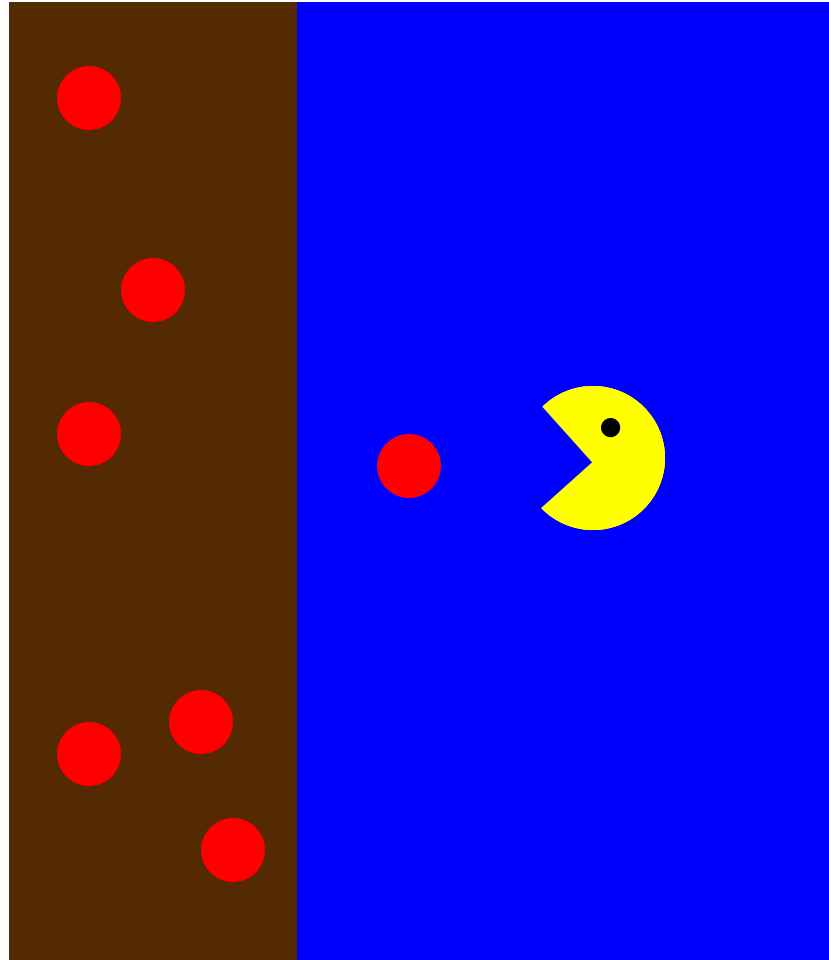
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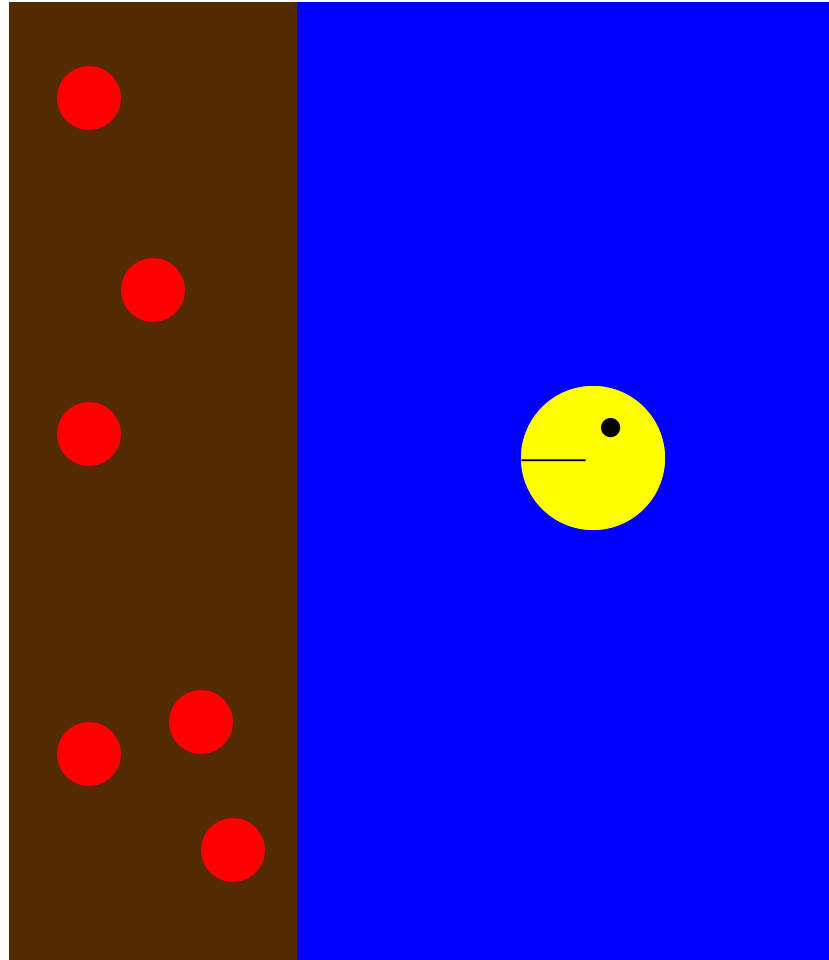
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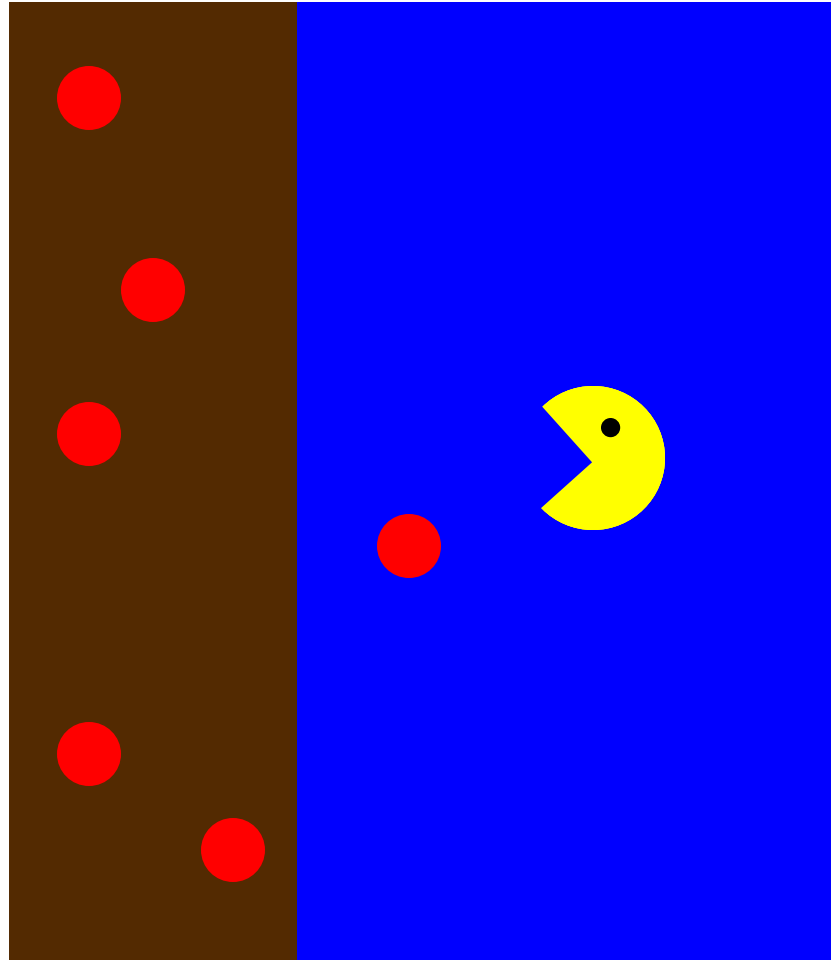
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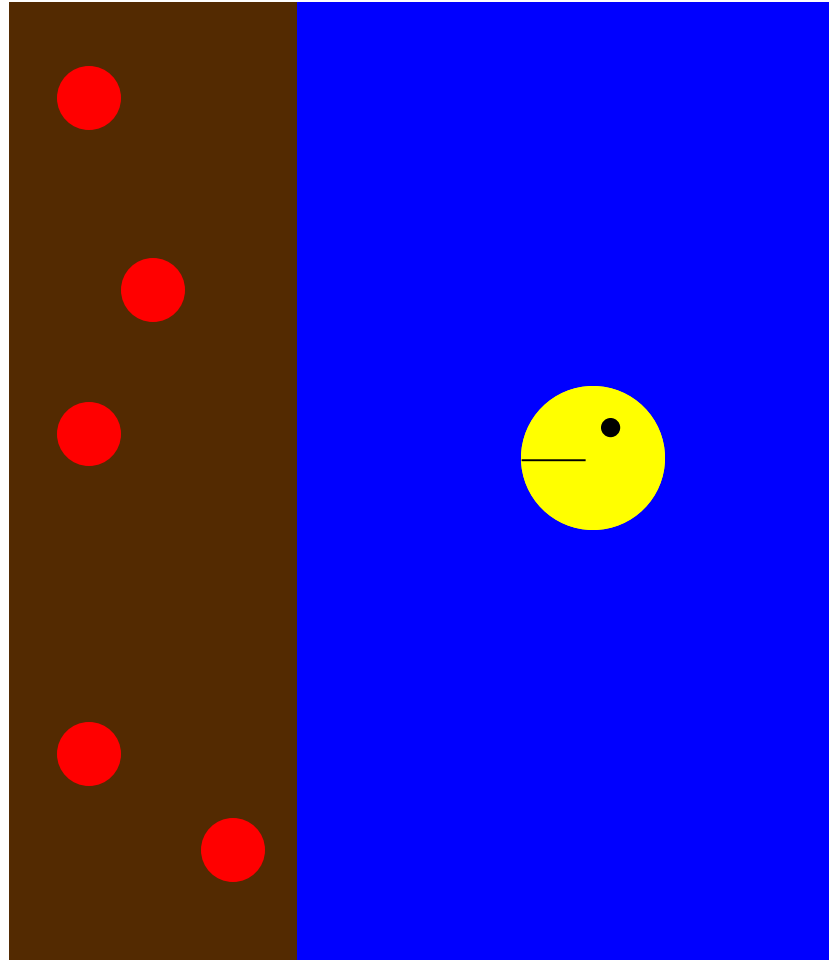
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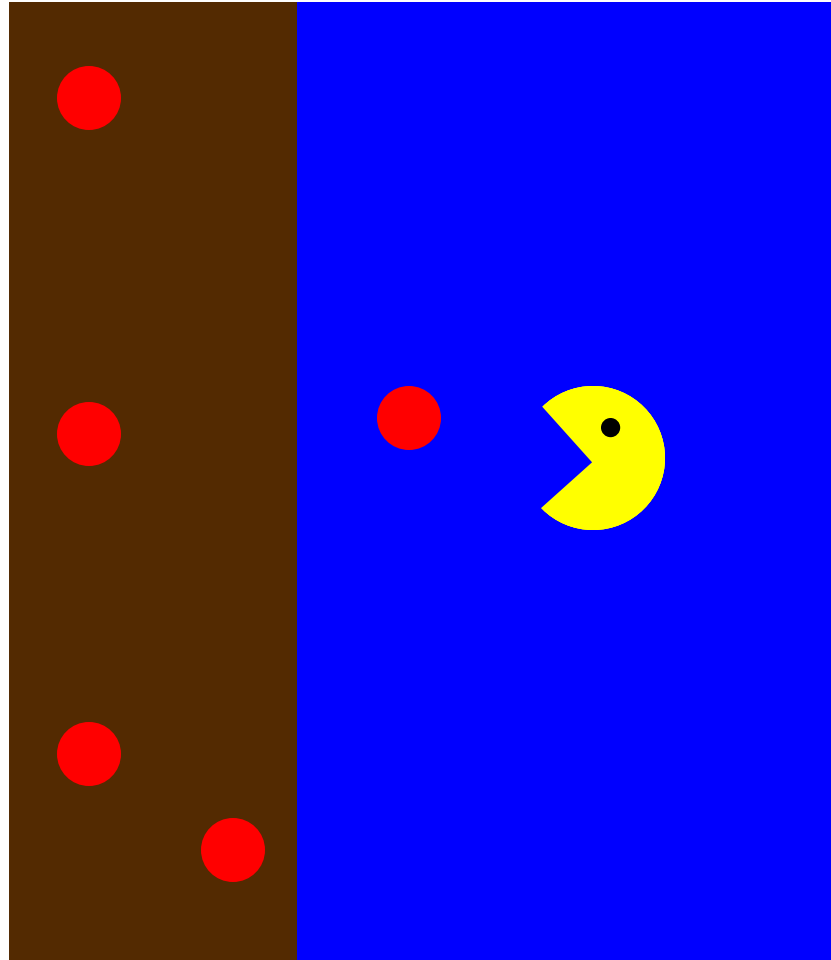
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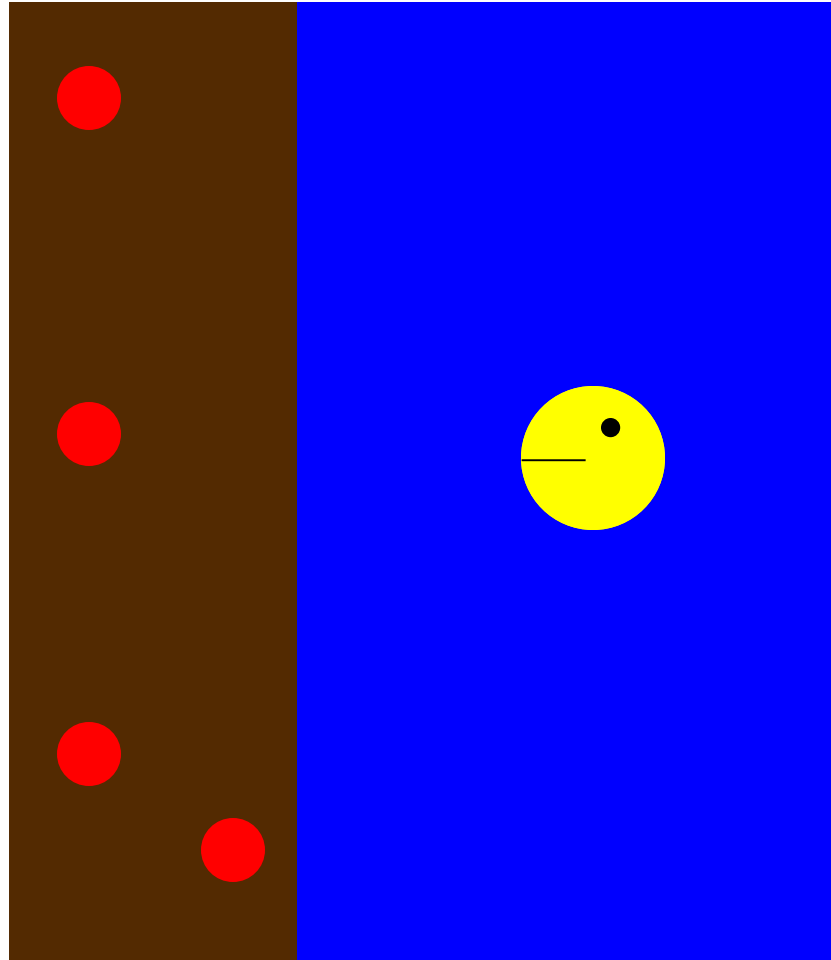
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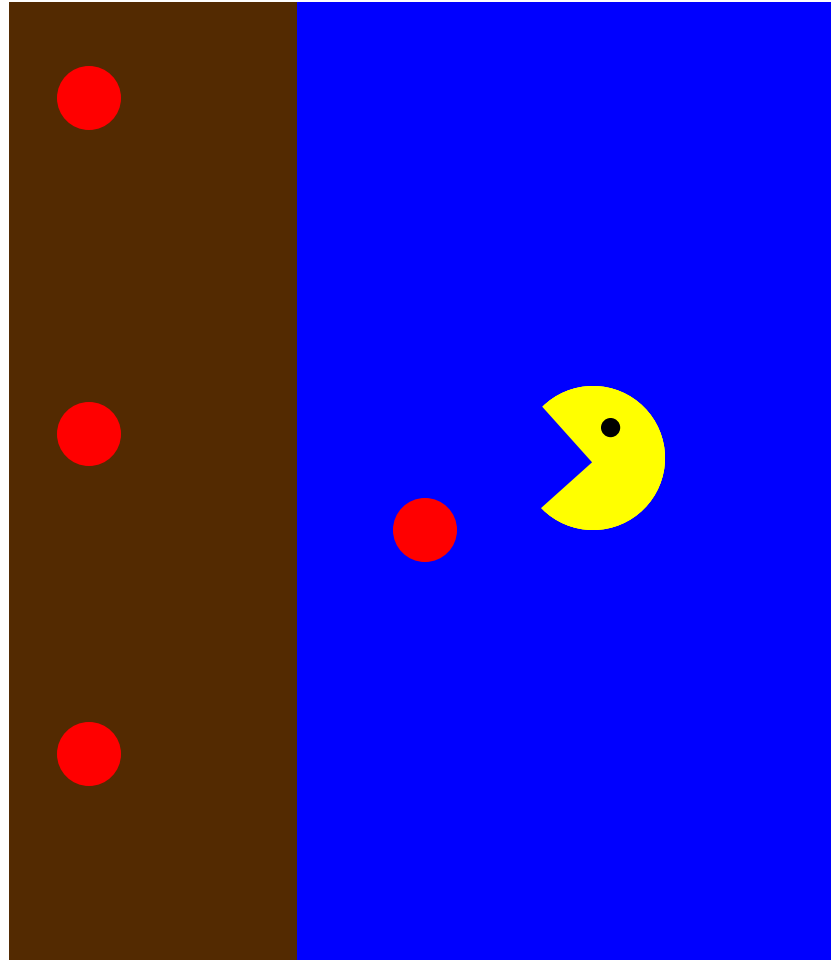
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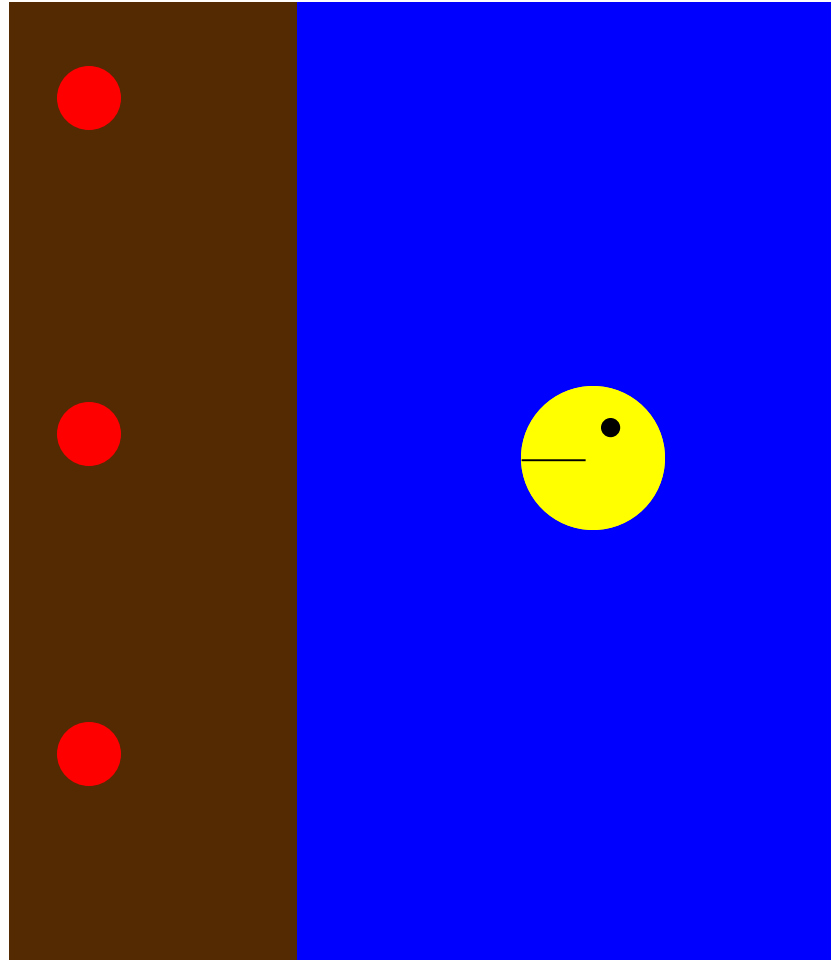
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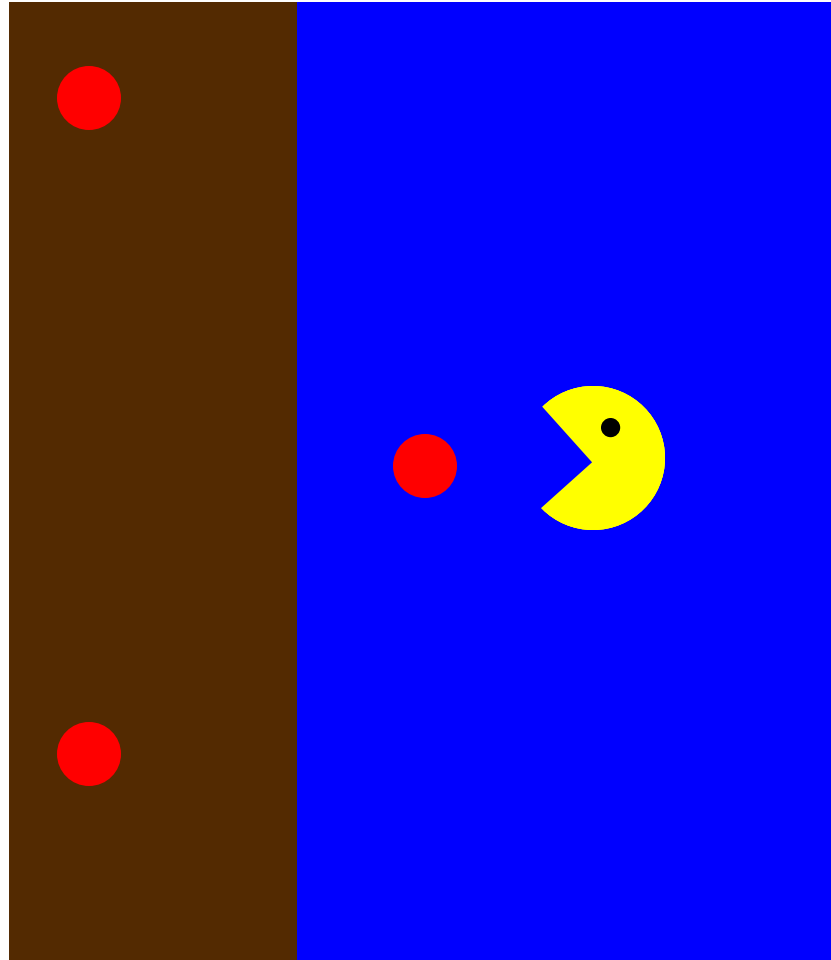
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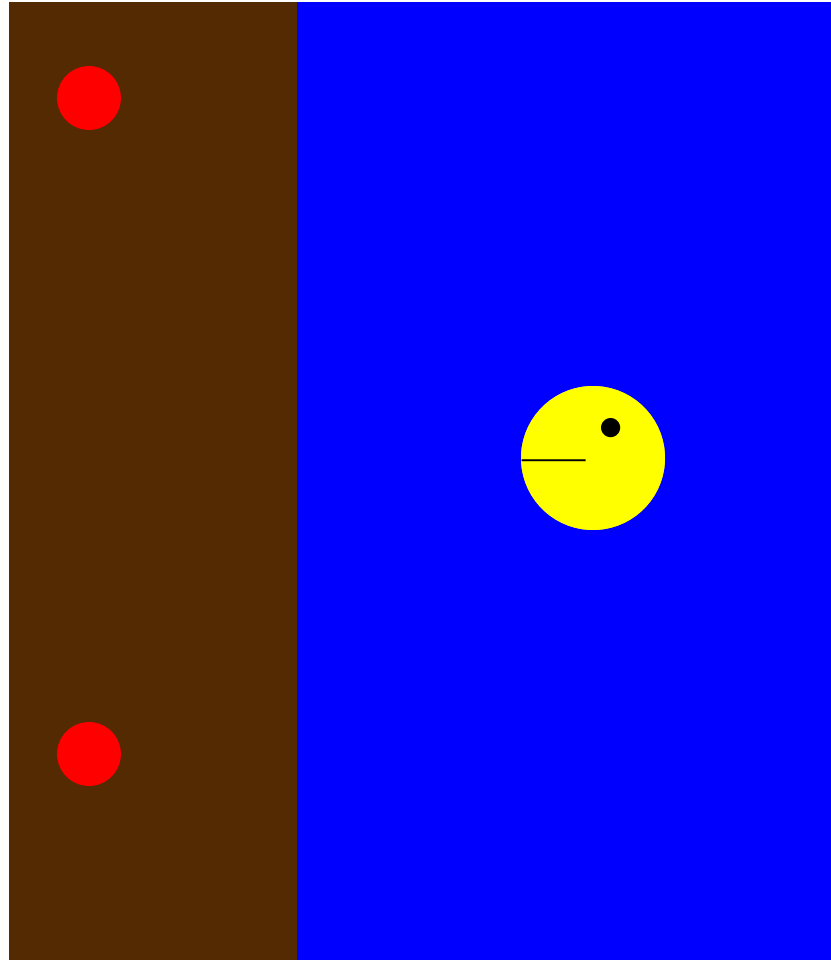
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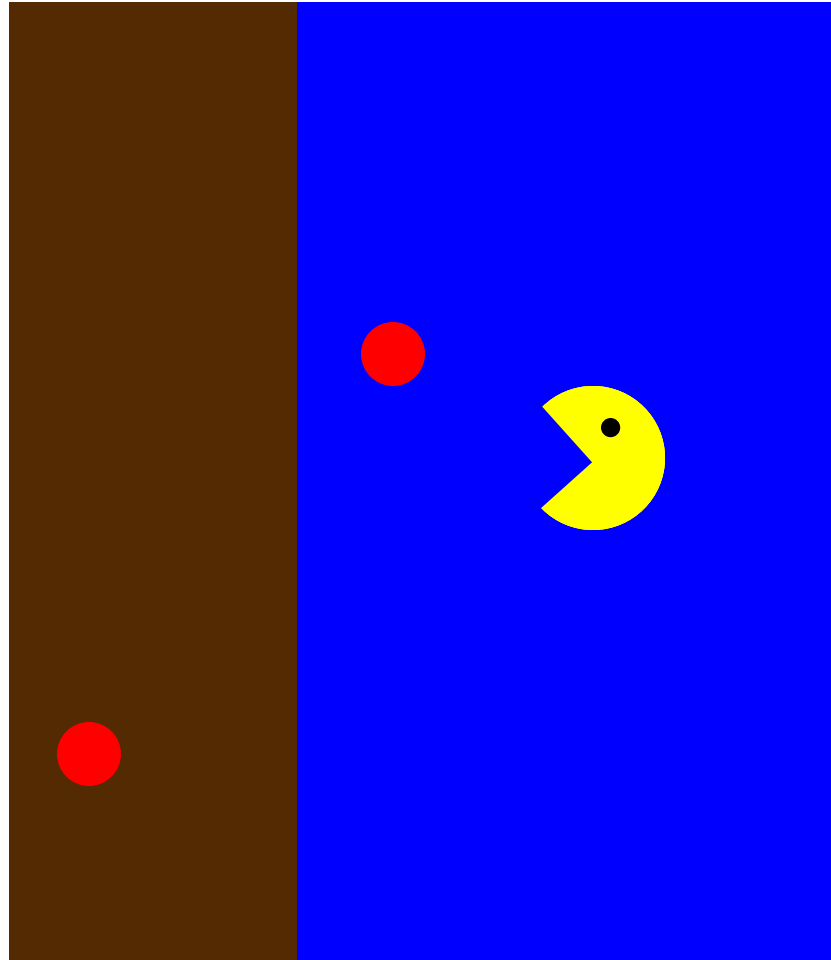
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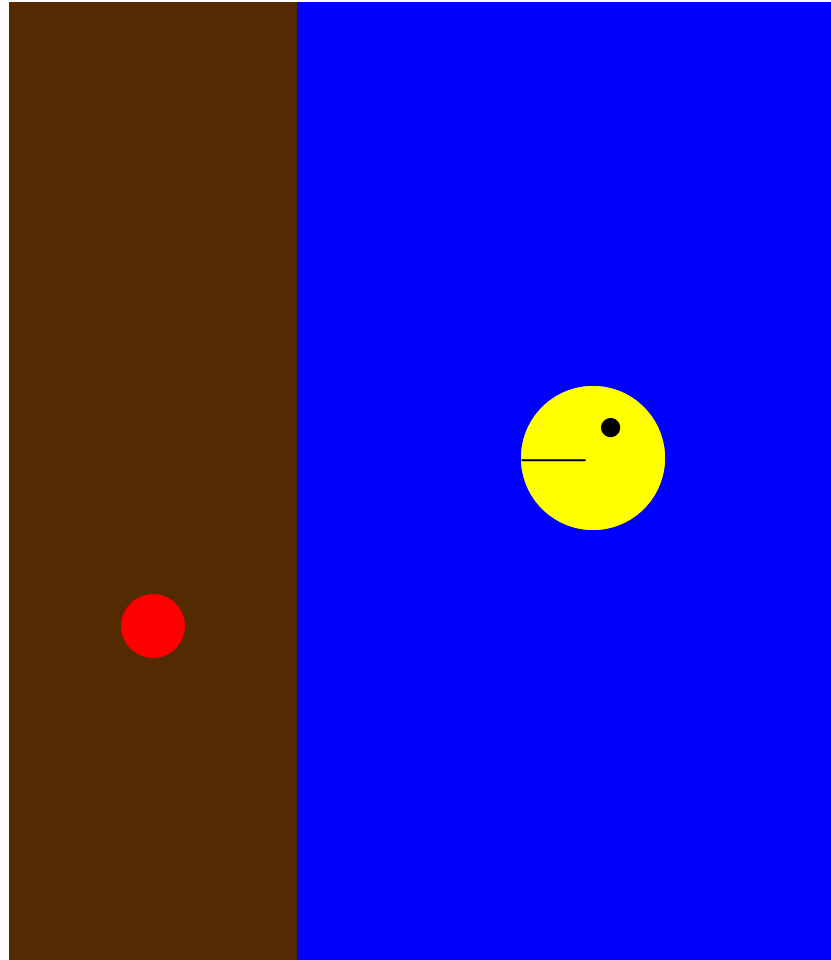
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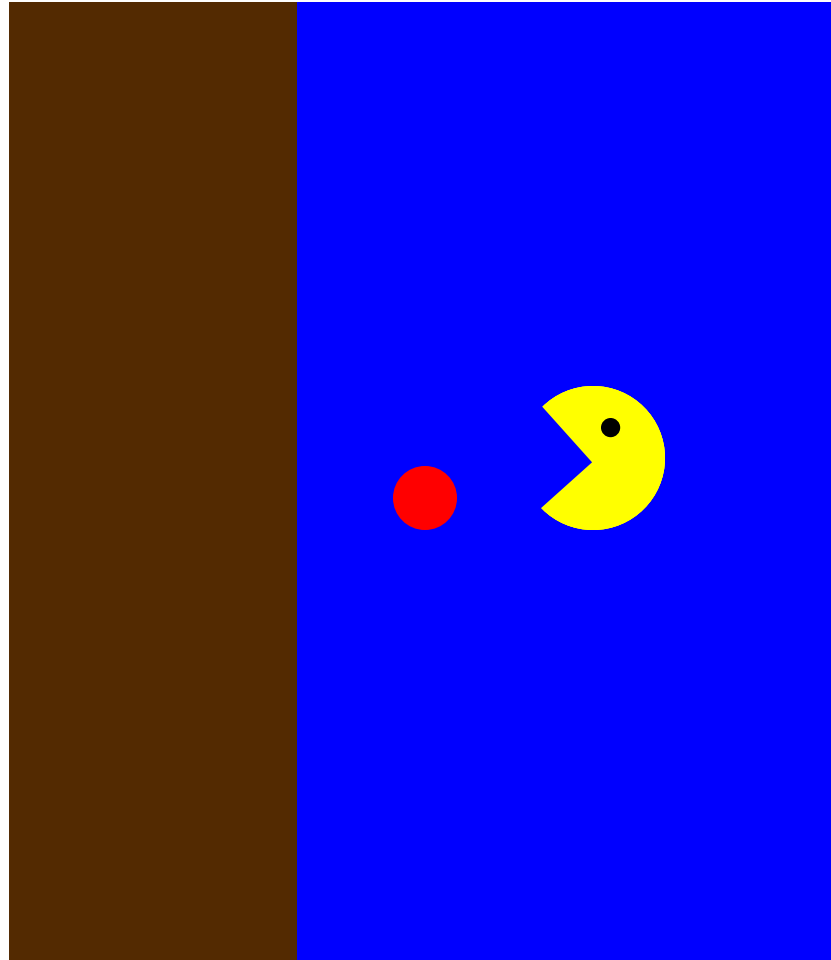
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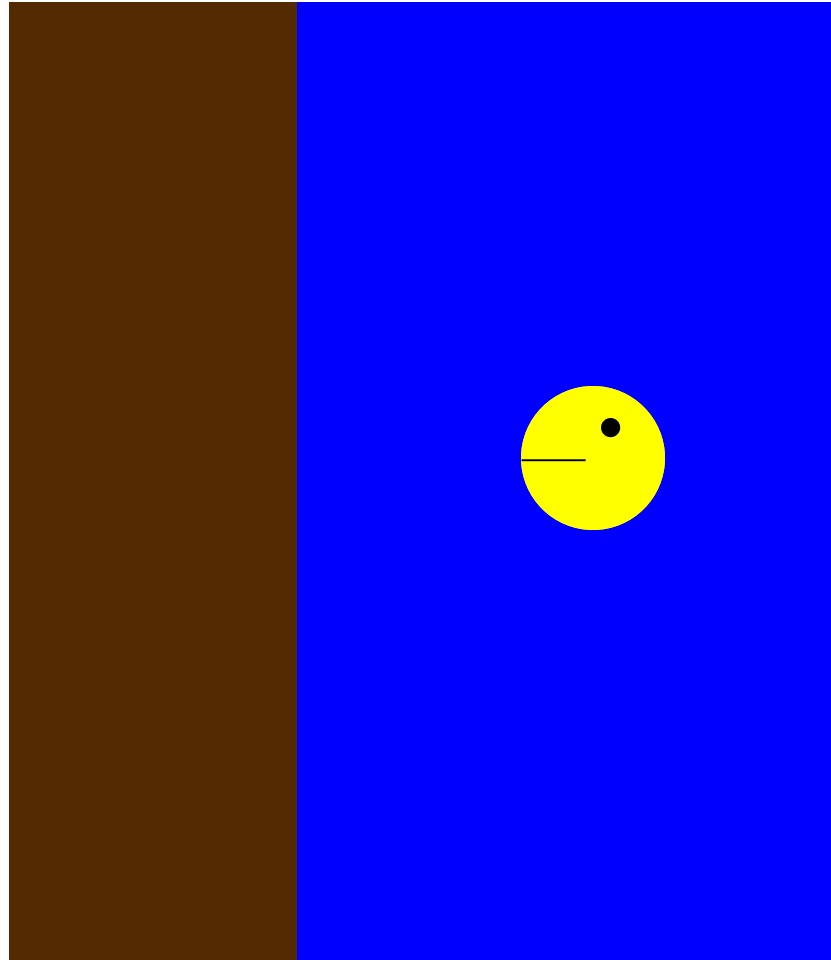
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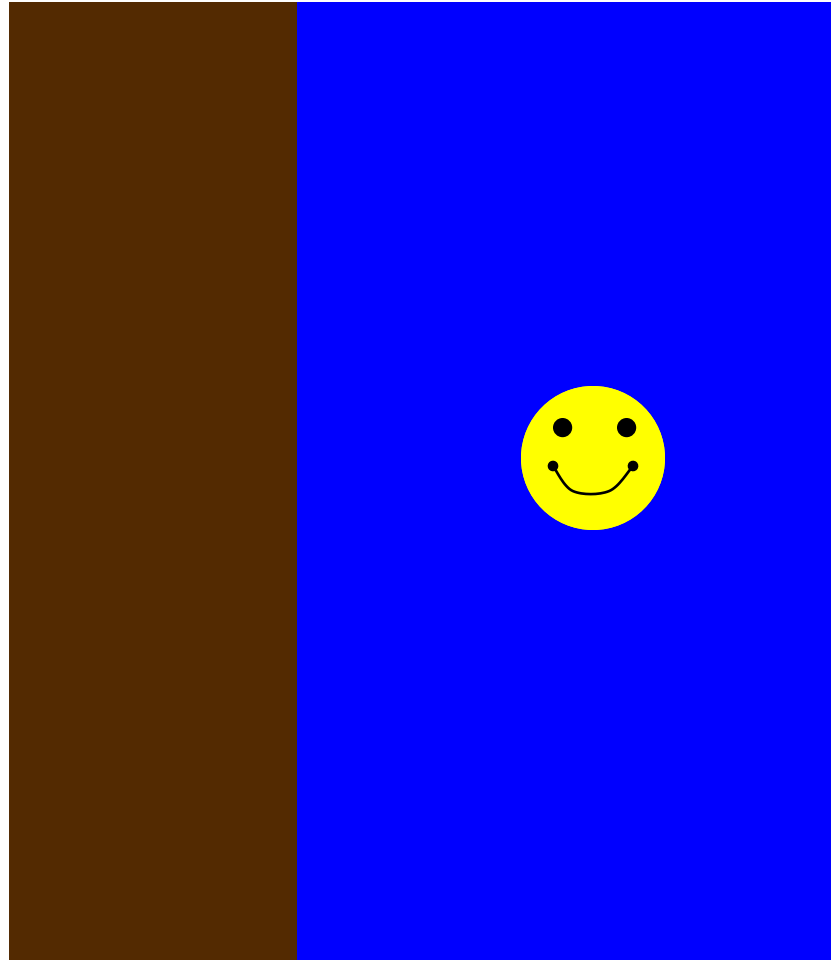
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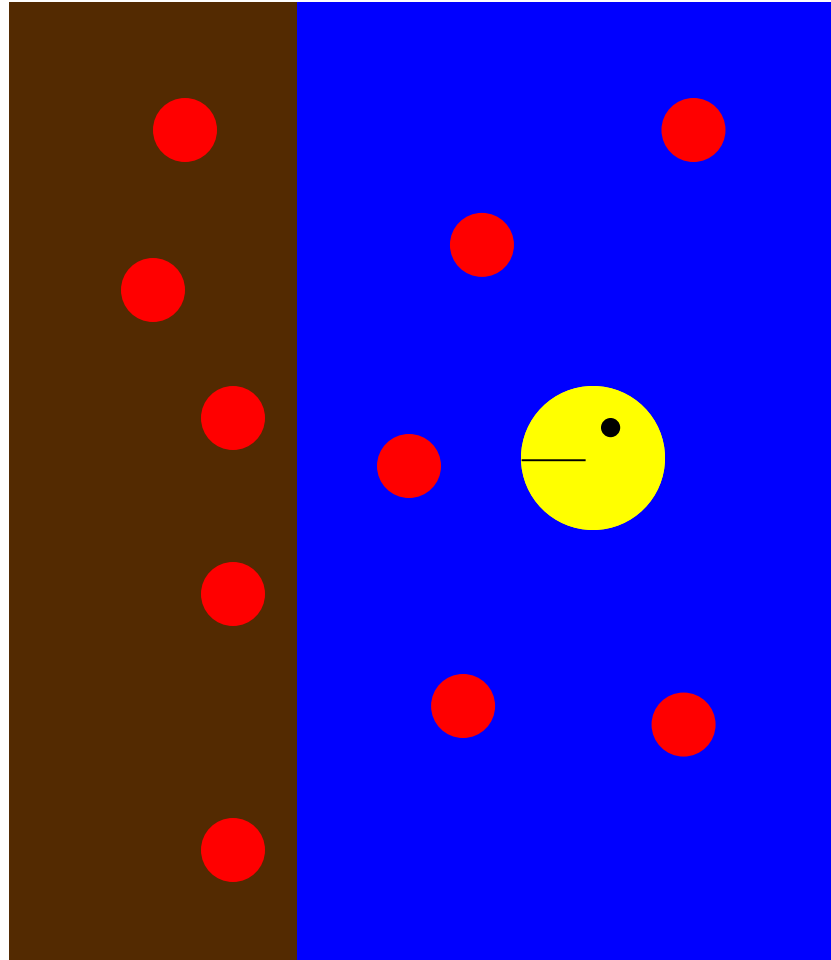
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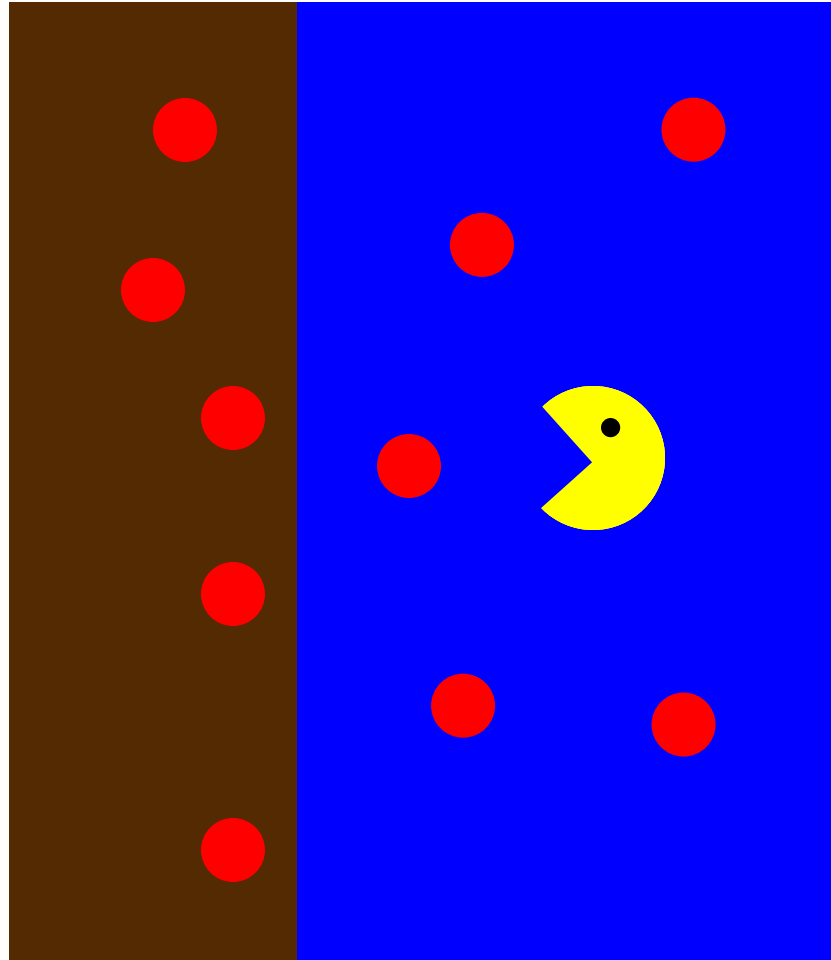
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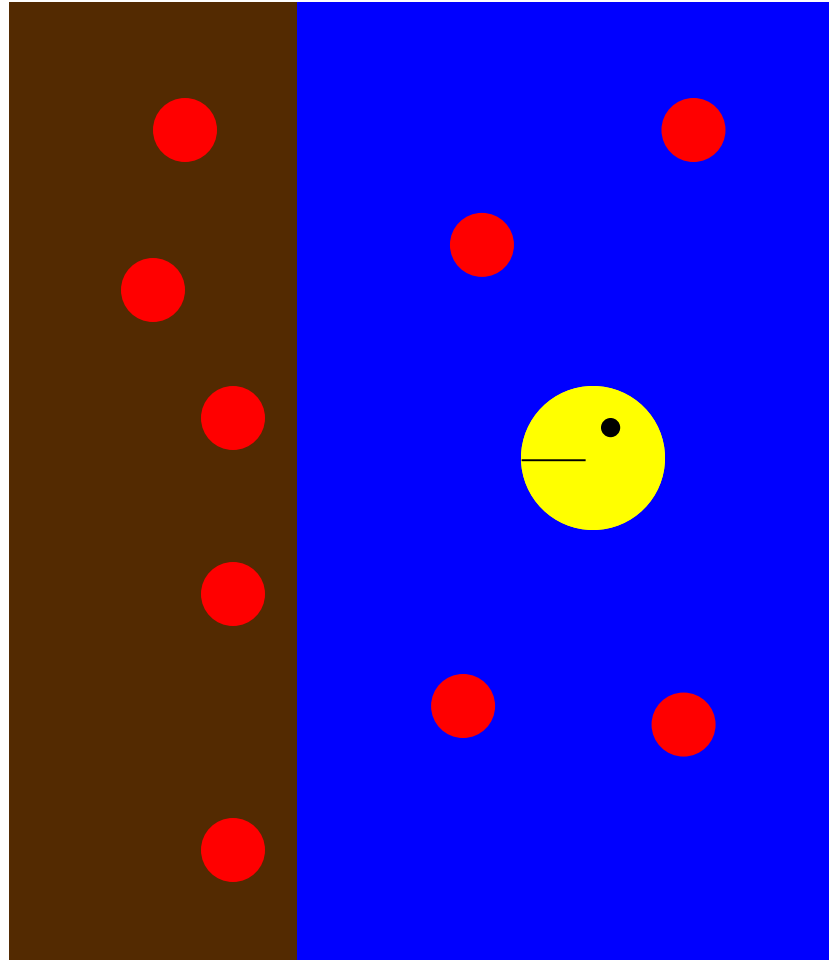
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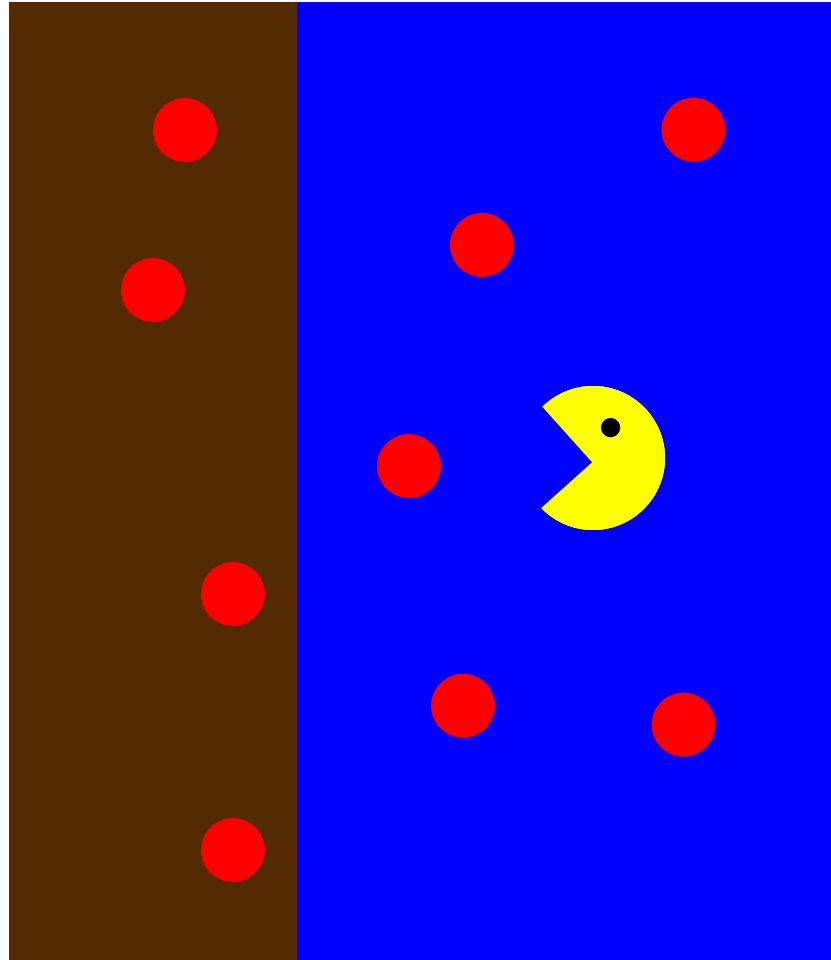
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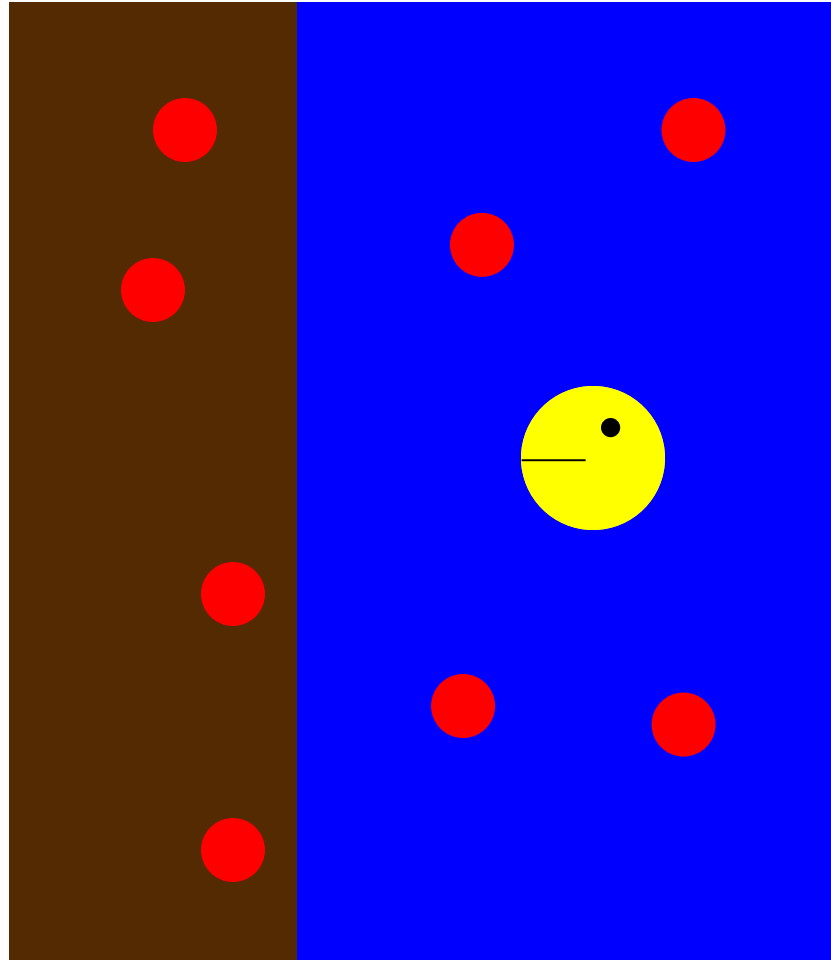
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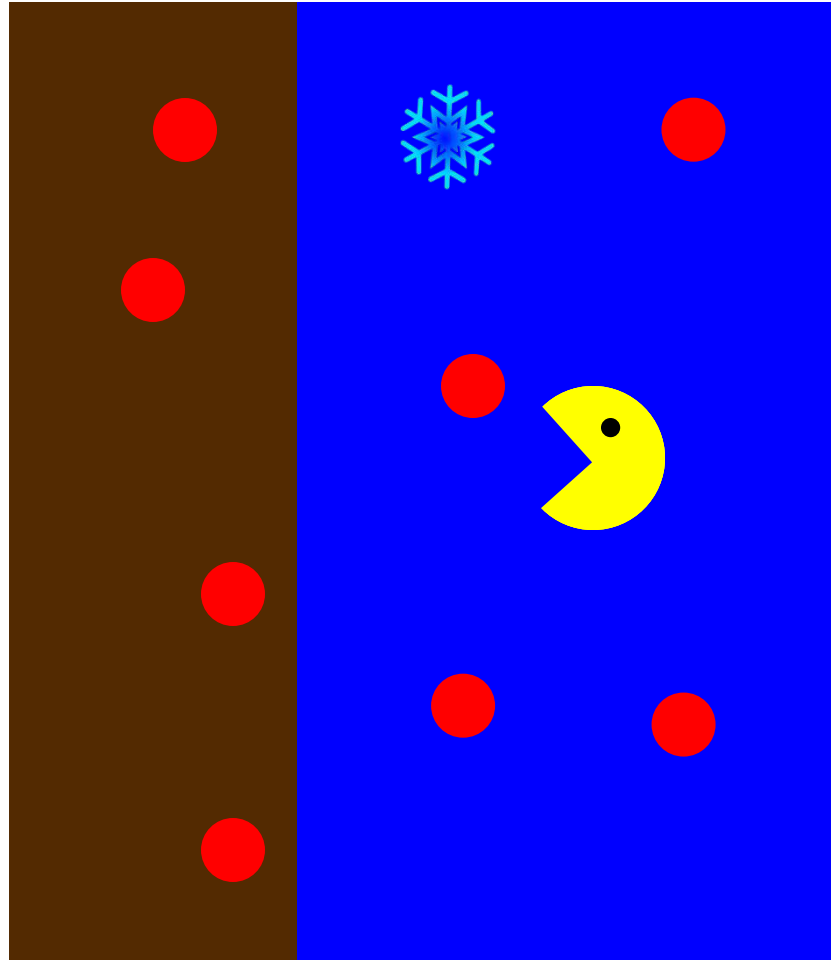
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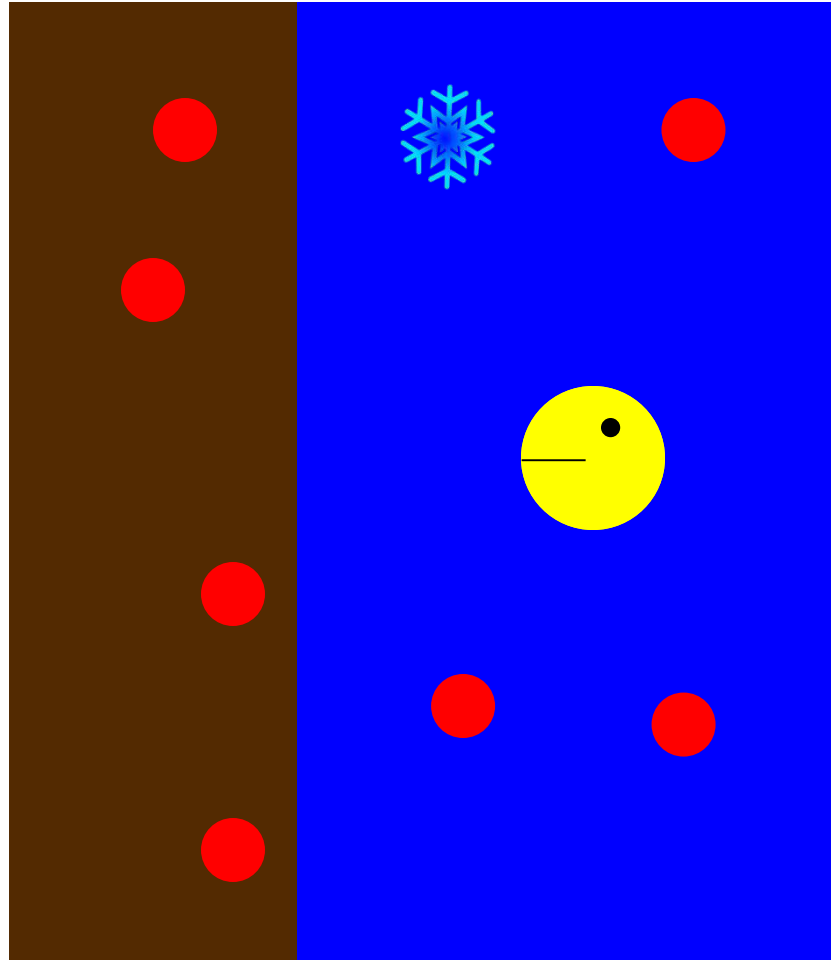
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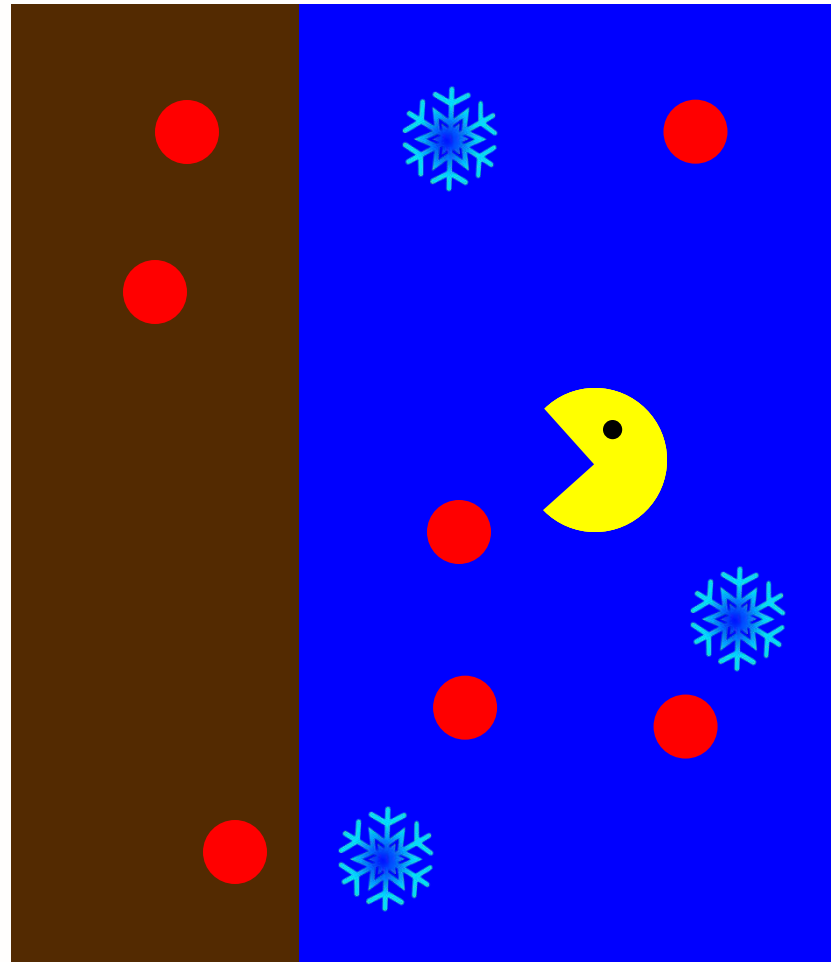
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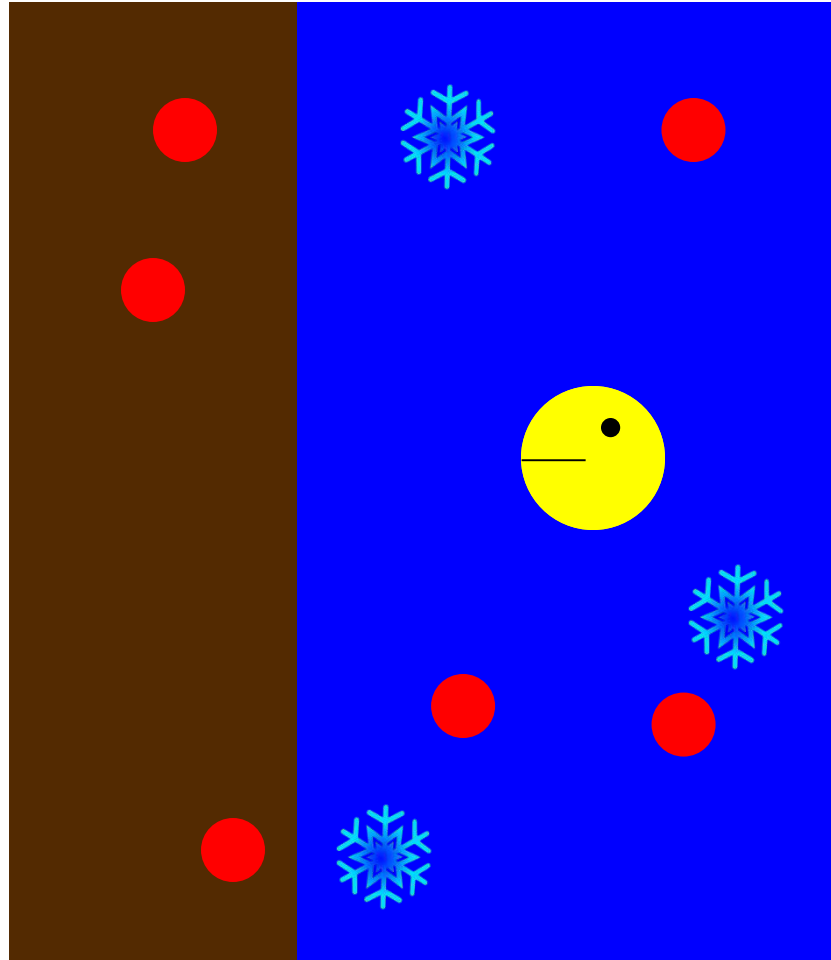
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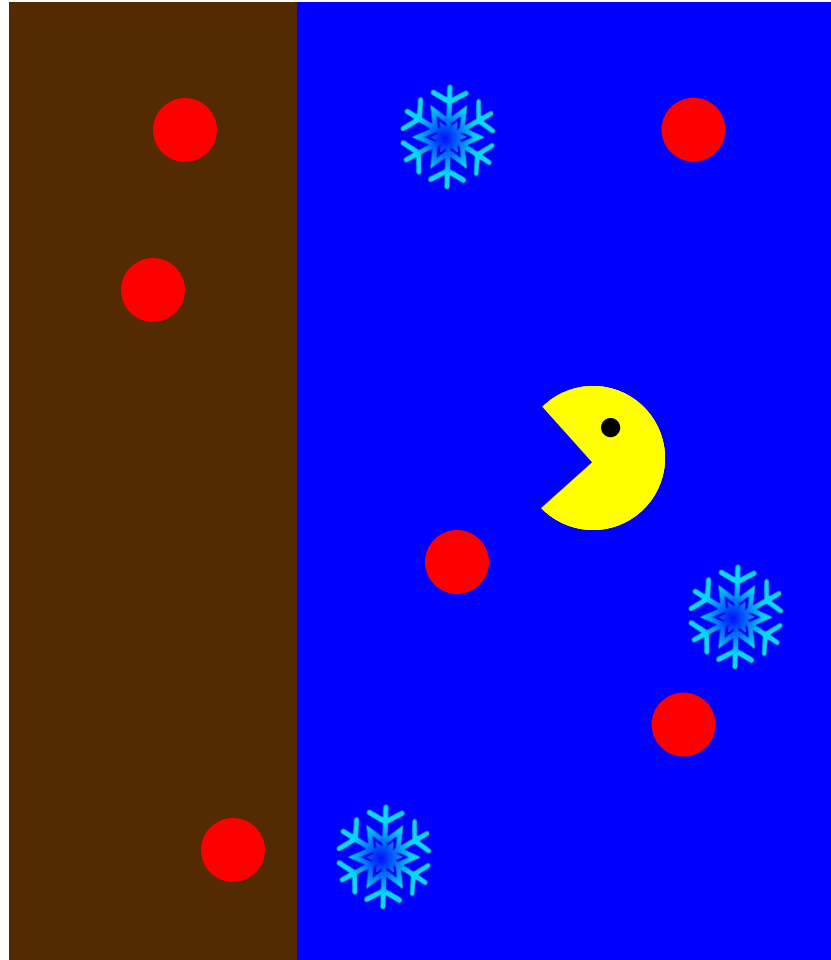
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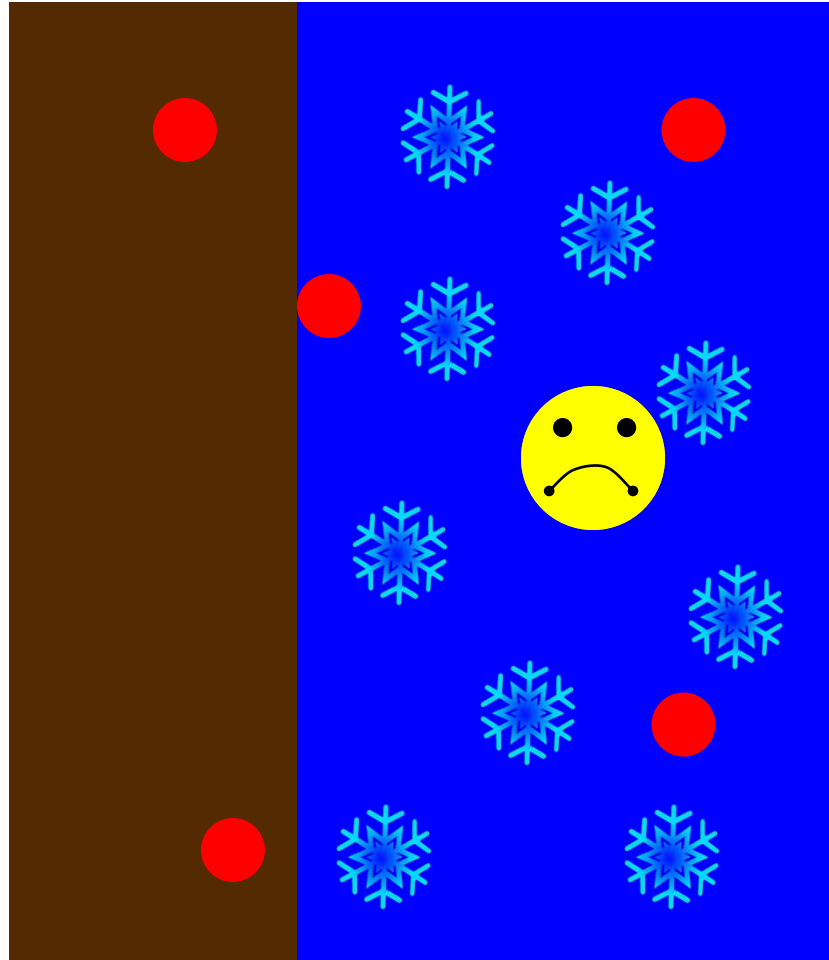
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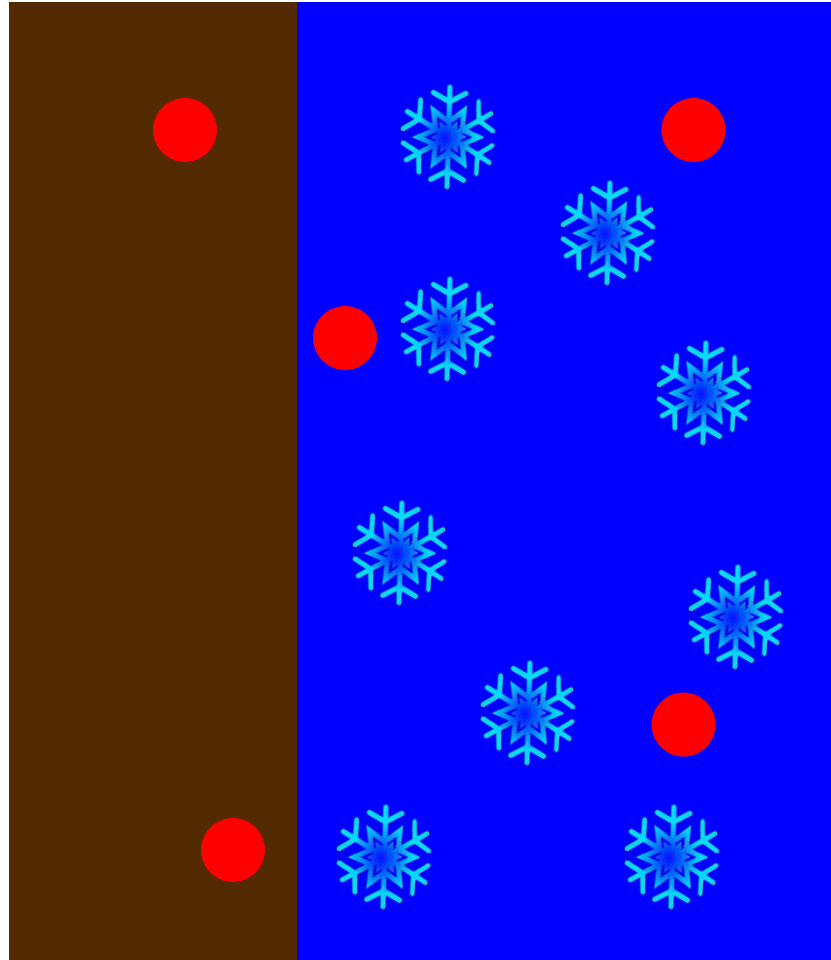
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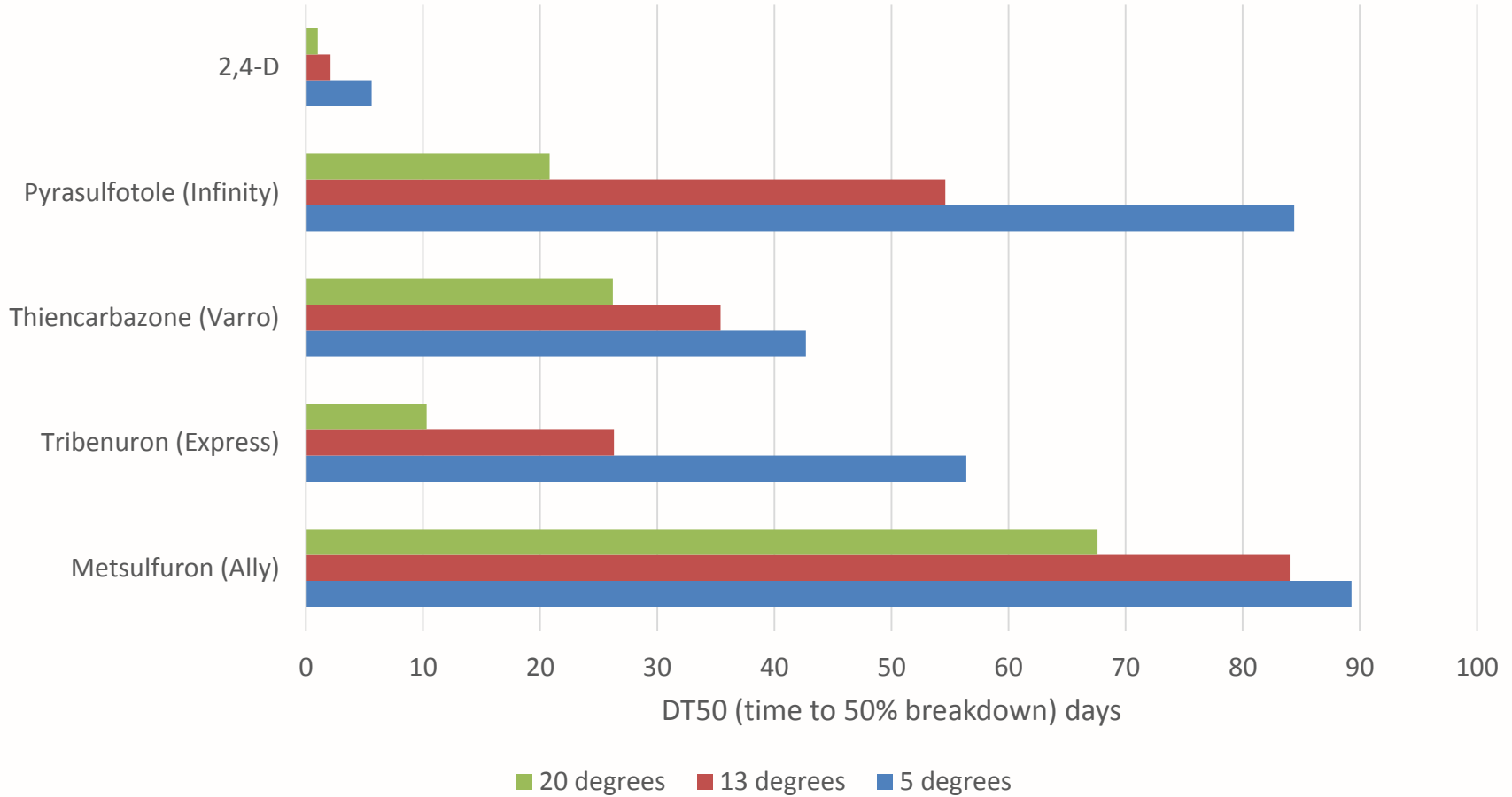


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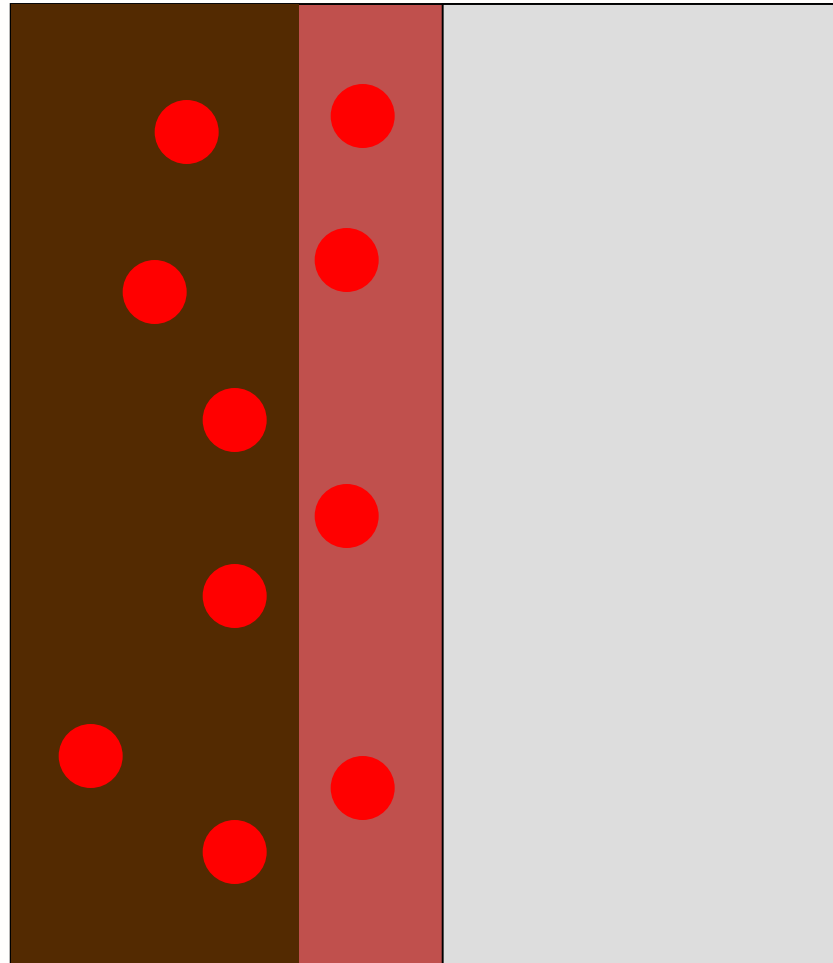


Effect of Temperature on Herbicide Breakdown



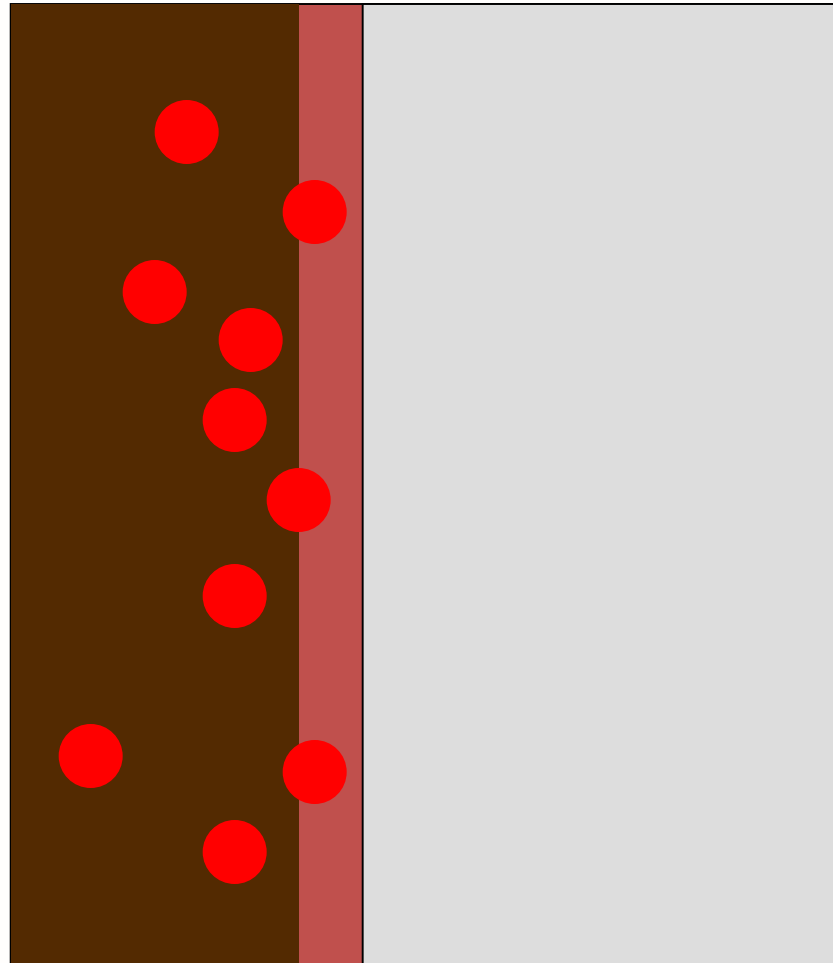
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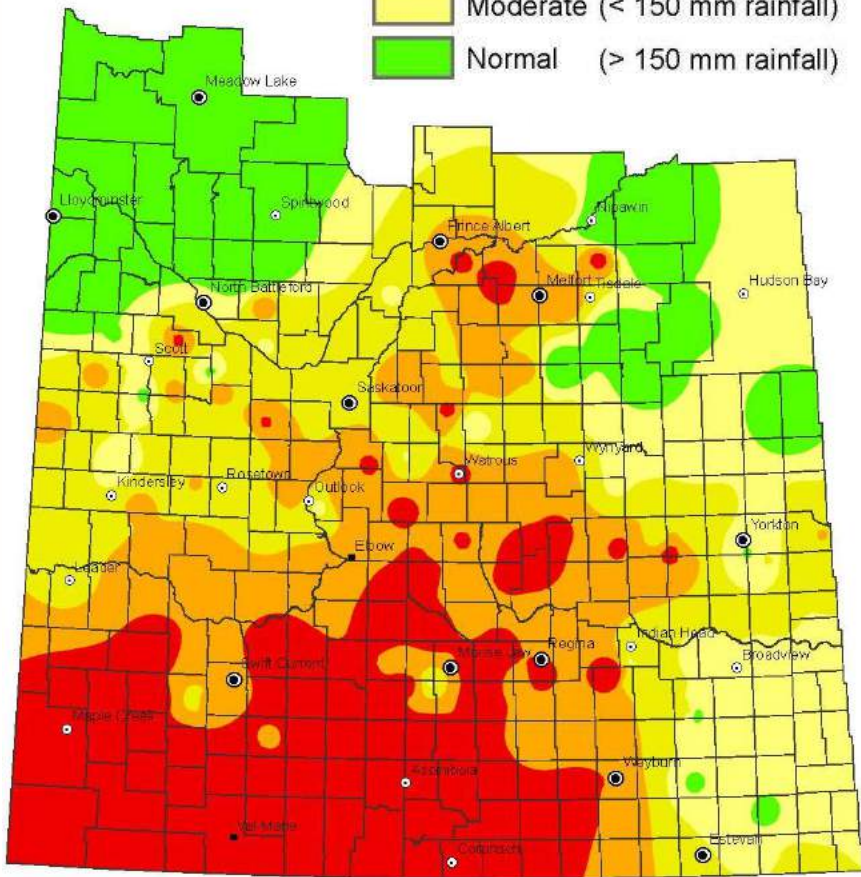
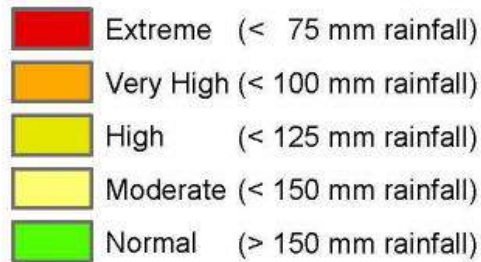
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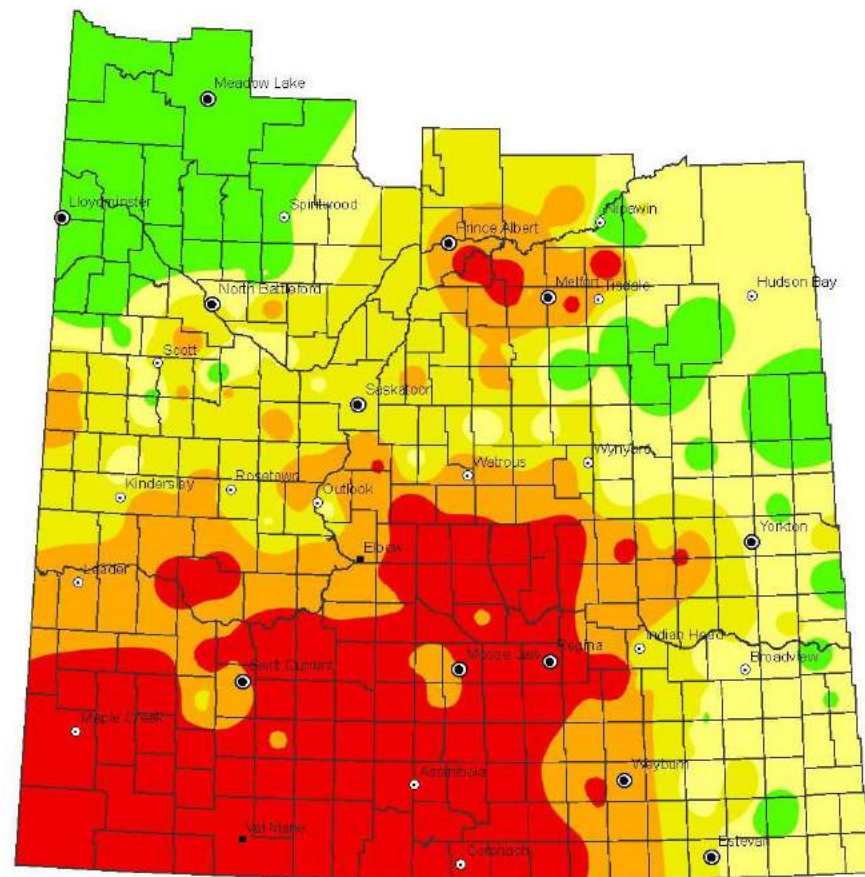


A retrospective on 2018

Risk of Greater than expected Herbicide Carryover



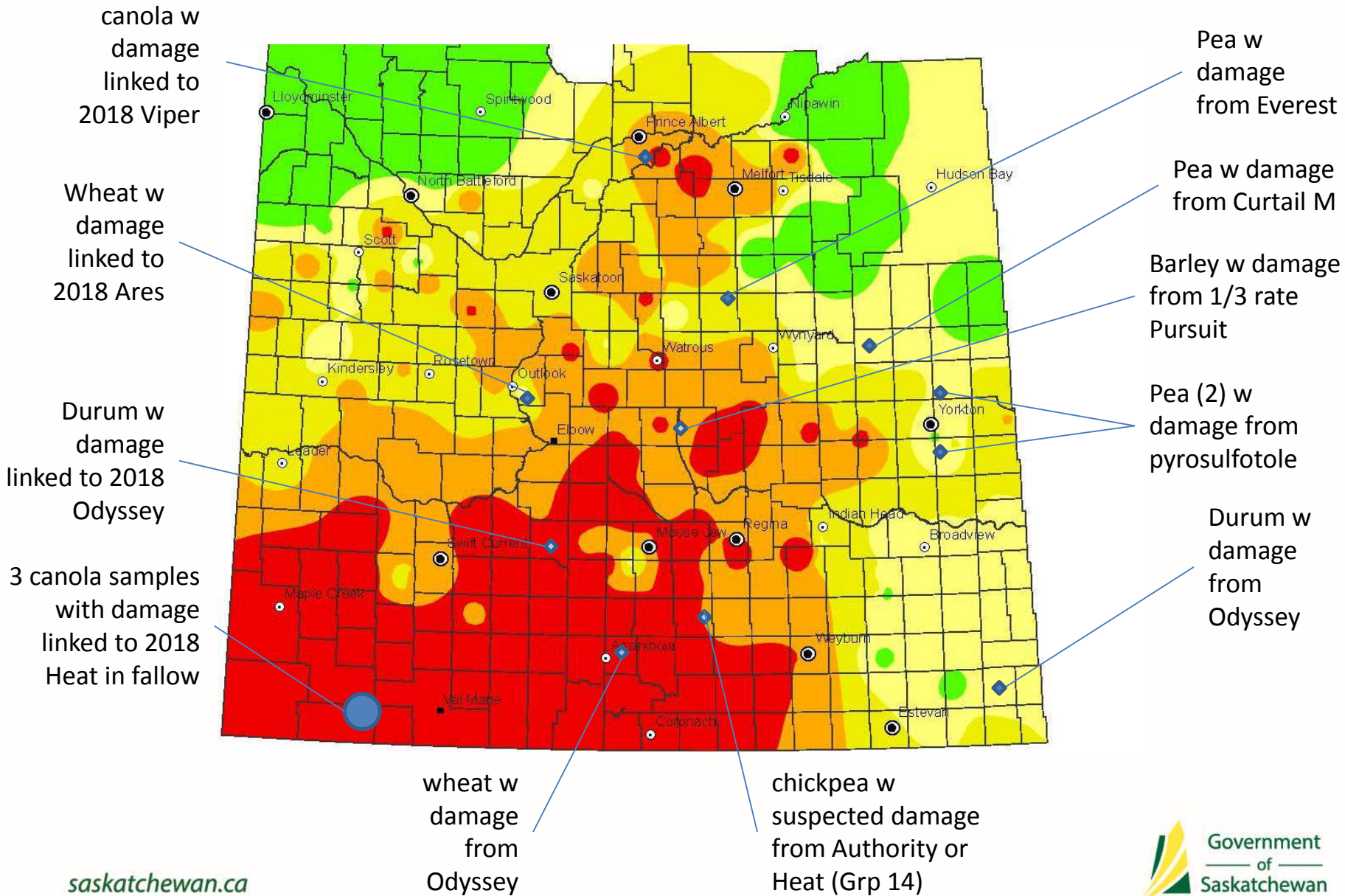
saskatchewan.ca Based on Rainfall from May 30 to August 28, 2017



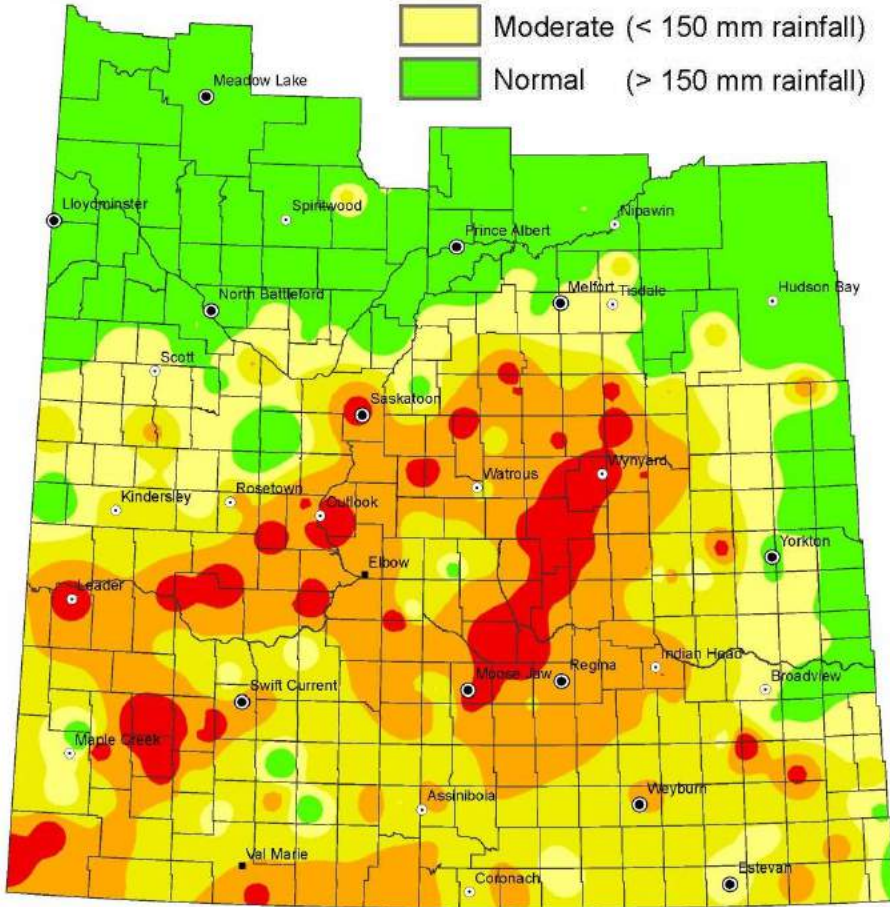
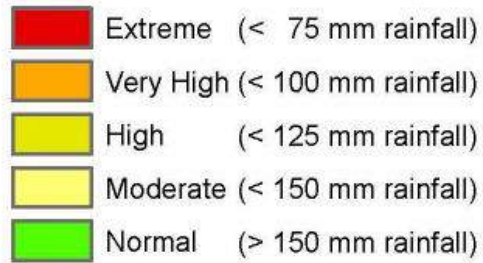
Based on Rainfall from June 13 to September 18, 2017

Risk of Greater than expected Herbicide Carryover in 2018

How did this fit with CPL diagnosis of residual damage?

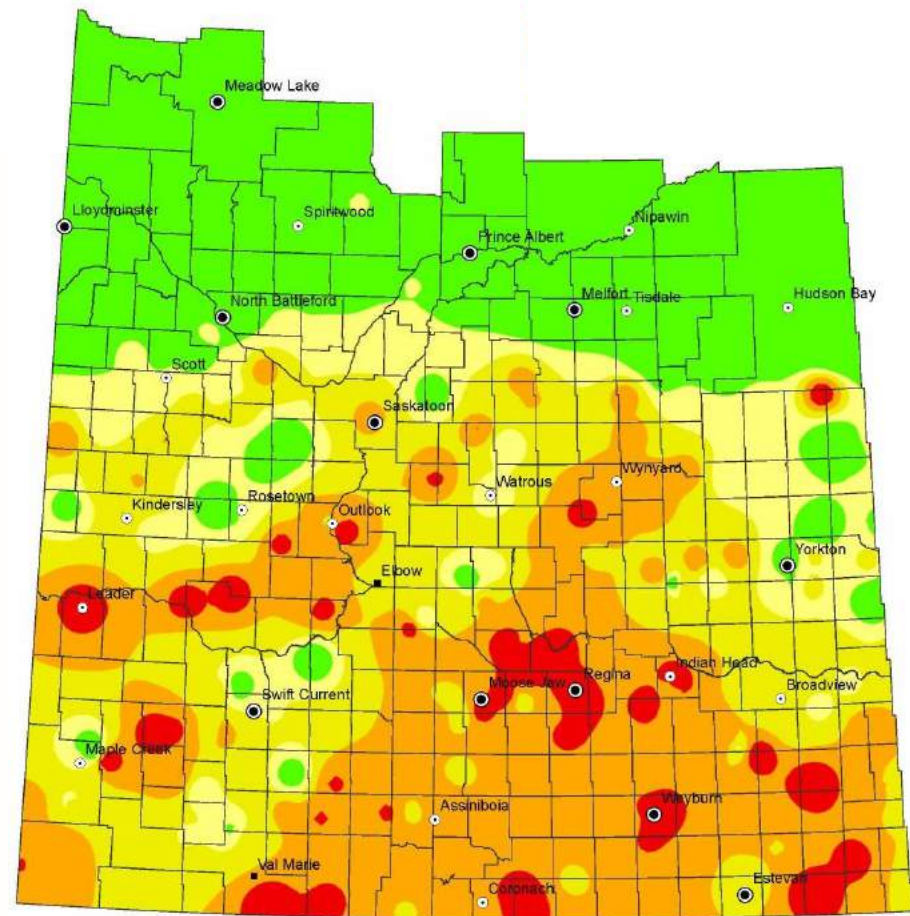


Risk of Greater than expected Herbicide Carryover in 2019



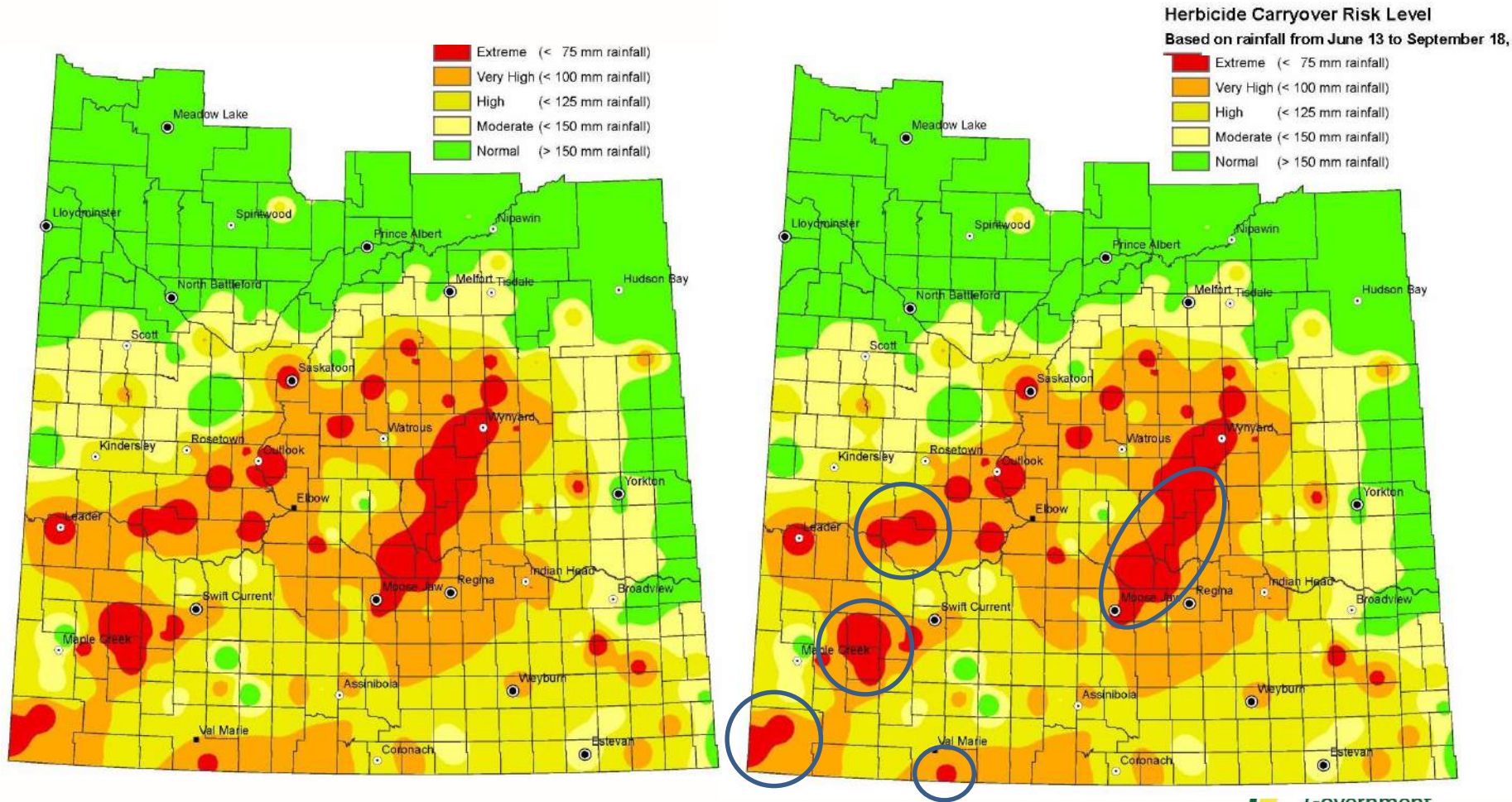
Based on Rainfall from June 5 to
September 3, 2018

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Based on Rainfall from June 19
to September 17, 2018

What could be the risk of stacking in 2019



How will this effect my crop in 2019

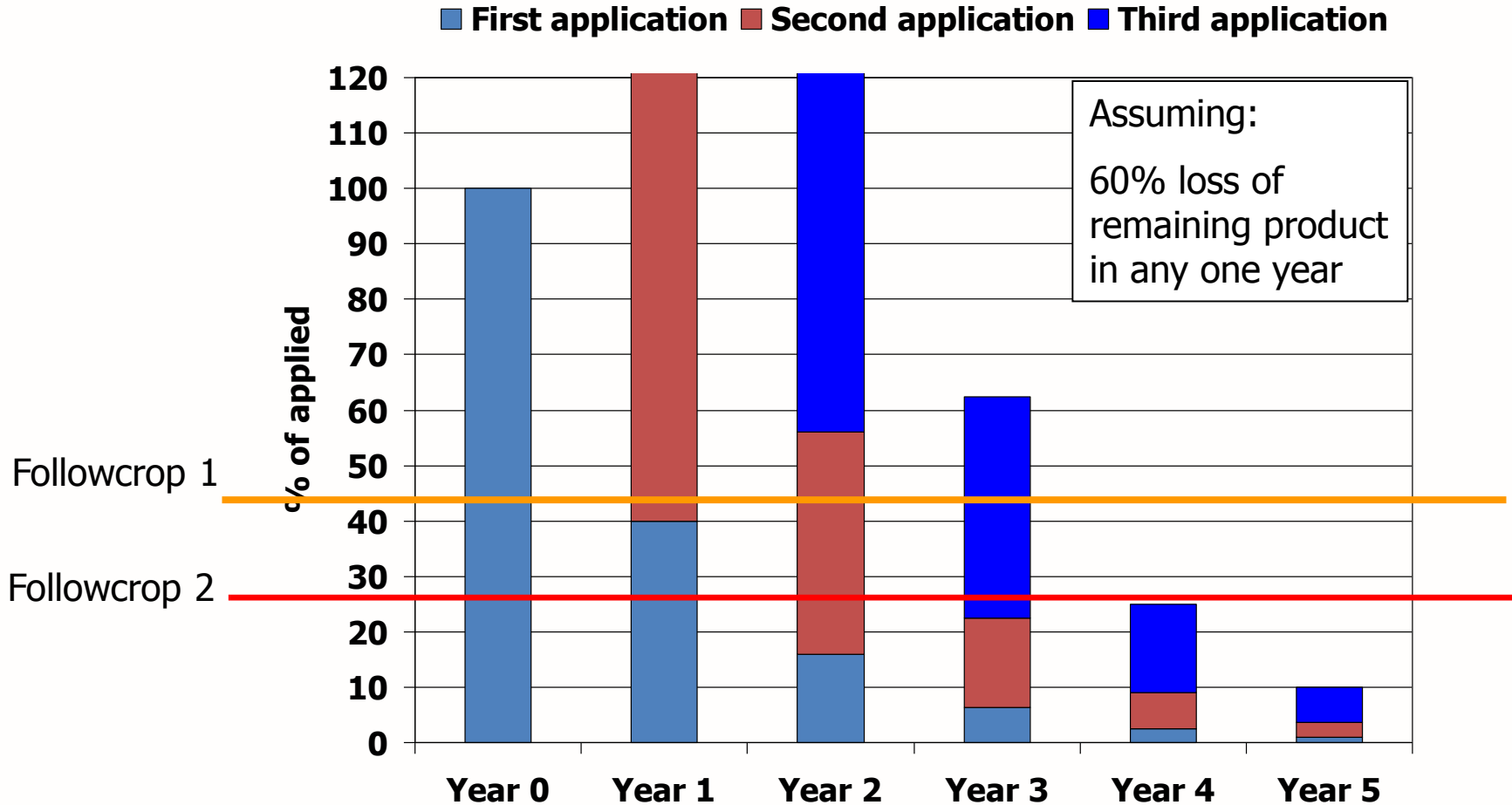
- There is a high risk of unexpected herbicide carryover in the areas south of a line between North Battleford and Melfort
- Most rainfall in 2018 was very spotty thunderstorms that produced obvious tracks but only isolated locations of adequate rainfall for breakdown
 - Map resolution doesn't capture all of these for better or worse
- Follow crop choices after residual products should be very conservative again in 2019 and select the safest crop to avoid injury.
- Consult with the manufacturer of your residual 2018 (and possibly 2017 or 2016) herbicide to determine the safest crop options

Herbicide Stacking?

The combined or additive effect of soil ***residues*** and/or foliar applications of herbicides (primarily of the same herbicide resistance group) when ***applied in subsequent years.***

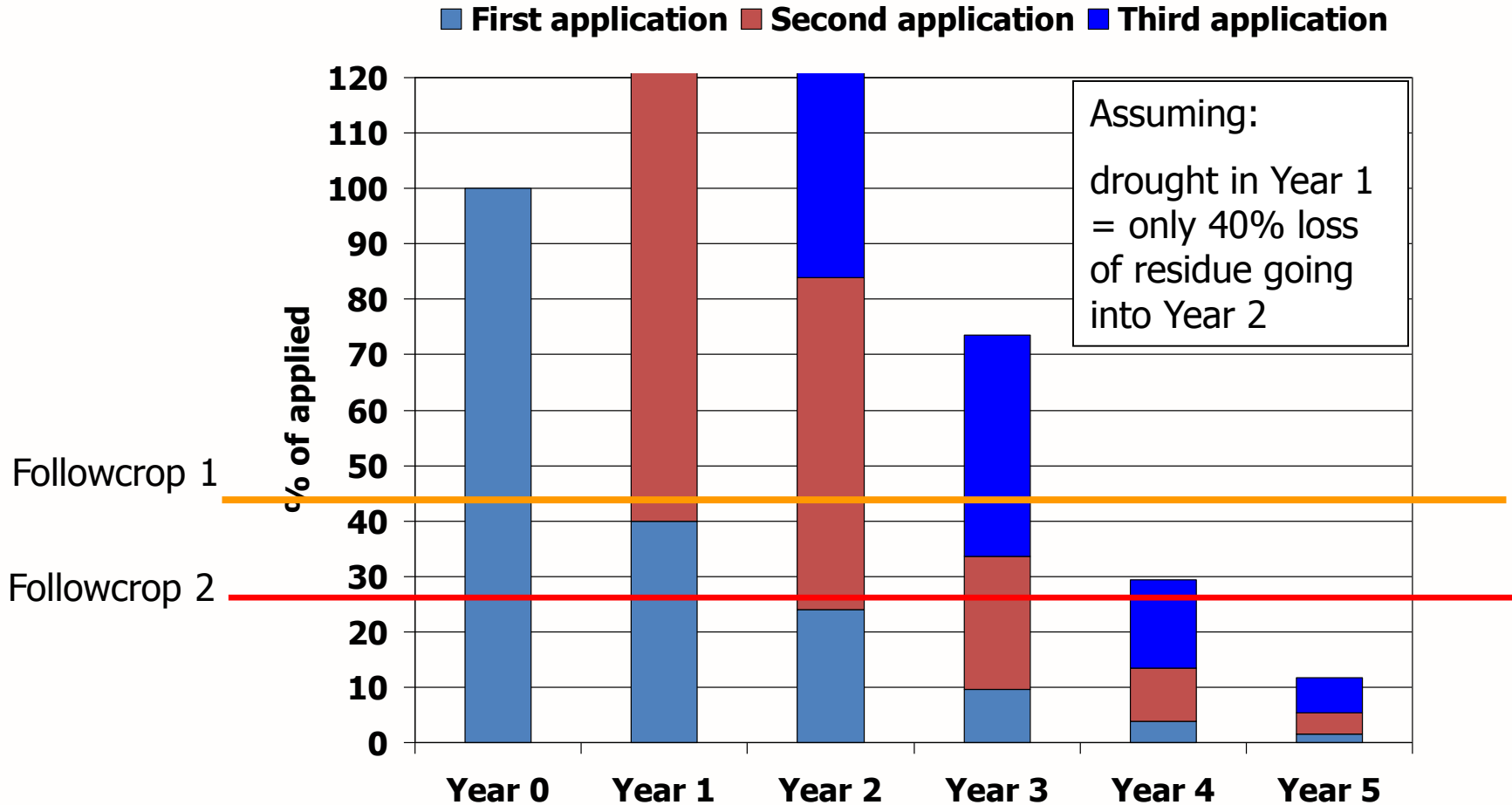
What is “Stacking?”

Traditional/Theoretical



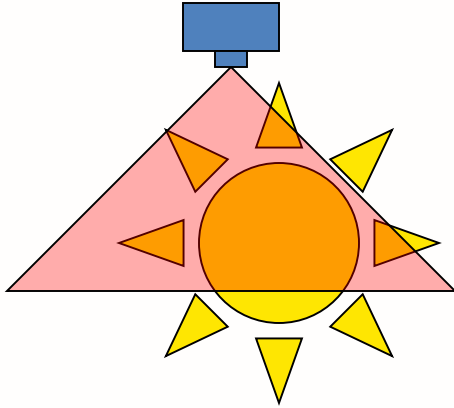
What is “Stacking?”

Traditional/Theoretical



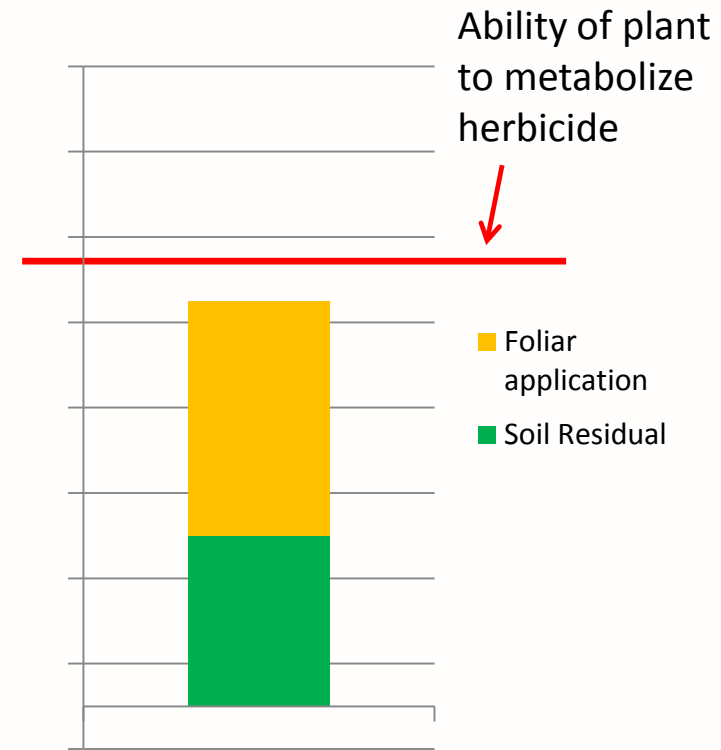
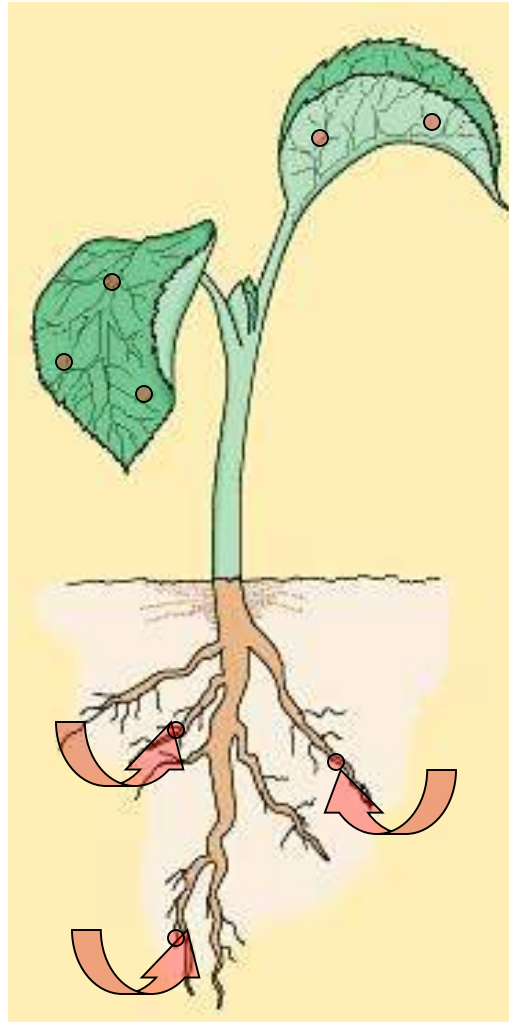
What is “Stacking?”

Additive metabolic stress



Environmental stresses?

- Heat
- Drought
- Cold
- Insect and disease damage
- Poor fertility or fertilizer placement
- Deep seeding



Herbicide Carryover

How Bad is it?

How can I find out?

Updated Label Recommendations

- Companies may not have had experience with poor climatic conditions during development of product
 - Example – many of the newer soil active herbicides
- When problems are experienced, labels are quickly updated once effects are understood.

Herbicide Residue Detection Systems

- Field bioassay
 - Doesn't tell you what you can do this year
 - Need to have left a check strip
 - Not terribly practical
- Chemical analysis
 - Costly – but cost has come down with technology improvements
 - No one can tell you with confidence what the results mean
 - Group 2 herbicides can be active below level of detection/quantification
- Lab Bioassay (A&L Labs – London ON)
 - Similar cost to modern chemical analysis
 - Results in about 2.5 to 3 weeks for pulses & 4 to 6 weeks for other crops
 - Sometimes more sensitive than chemical analysis for low use rate products
 - Contact A&L at 1-(855)-837-8347 or email at alcanadalabs@alcanada.com for more info
- U of S has developed additional bioassay technique that has not been adopted by any labs as yet – risk of false negative a bit high

Herbicide Persistence

Summary

- Major routes of degradation of herbicides, microbes and hydrolysis both require soil moisture and warm temperatures
- Soil moisture levels **below normal** in most of the province and **well below normal** in the southwest
- Soils can vary in pH and in organic matter - dictates buffering capacity
- Don't waste money on chemical soil analysis since buffering ability of soil clay and OM is not considered
- Lab bioassays are more reliable, inexpensive and crop specific – use plant to detect plant available residue.
- Producers in much of the province need to be conservative on recropping options

Questions?

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