

Proposing legislation to prevent pesticides found in polluted water from causing Alzheimer's disease

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Abstract





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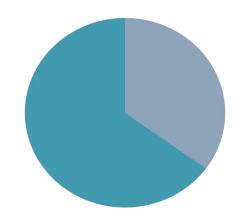
Importance of this Topic and Problem

60-70%

Of all dementia cases are Alzheimer's disease

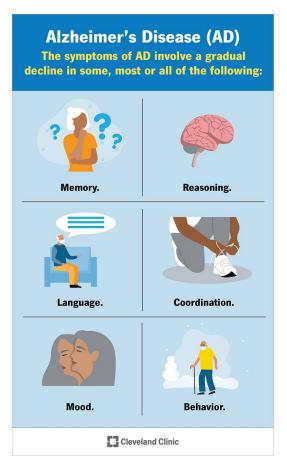
Affects

Memory, critical thinking, learning and can severely impact quality of life



Exposure to risk factors

May have occurred years before the onset of symptoms



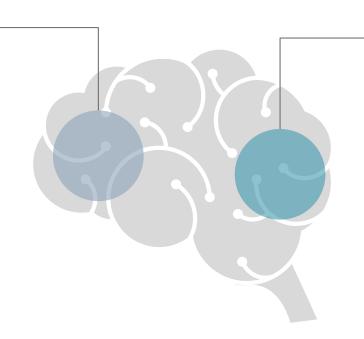
Alzheimer's Disease

Clinically characterized by a progressive decline in cognitive function, and is the most common form of dementia

Аβ

Amyloid-Beta

A normal product of the cellular metabolism that is a highly insoluble (and sticky) protein commonly found in great quantities within neuritic plaques



Phosphorylated Tau

p-tau

Protein

Tau is a protein used within microtubules to provide structural support. Upon phosphorylated, they break off and form neurofibrillary tangles

Neurotoxic Pesticides

Rotenone

- inhibits the mitochondrial electron transport chain (ETC)
- reduces ATP produced via oxidative phosphorylation
- results in less energy for high-demand brain cells and a switch to aerobic glycolysis

Deltamethrin, cypermethrin and carbofuran

- causes the activation of glycogen synthase kinase-3β (GSK-3β)
- inhibits the protein phosphatase-2A (PP2A)
- causes tauopathy

Chlorpyrifos

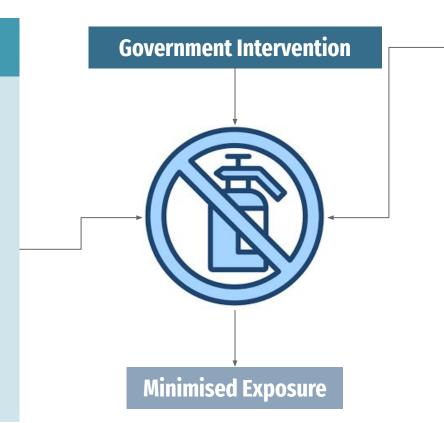
- inhibits acetylcholinesterase which impedes neurotransmission
- upregulates Aβ and tau
- activates GSK-3β
- causes hyperphosphorylation of tau



Proposed Method

Economic Policy

- Price controls on NDD-causing pesticides
- Incentive for farmers to find cheaper alternatives
- Demotivate producers by raising costs of production.



Education

- Targeted towards farmers and other agricultural sector workers
- Make information on IPMs more widely known
- Ensures sufficient knowledge for implementation and employment

Expected Results and Discussion



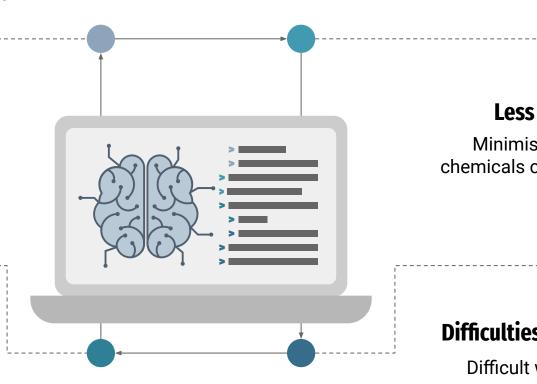
Less waste

Less being used means less of it is being introduced into water systems



Sustained agriculture

Farmers are able to maintain crop yield and quality

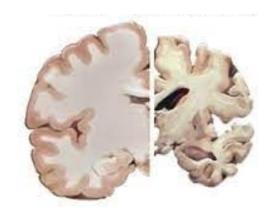


Less exposure

Minimises risks of chemicals causing AD

Difficulties with IPM

Difficult weeds and insects



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