HERBICIDE RESISTANCE

AN INTRODUCTION

WHAT IS IT?

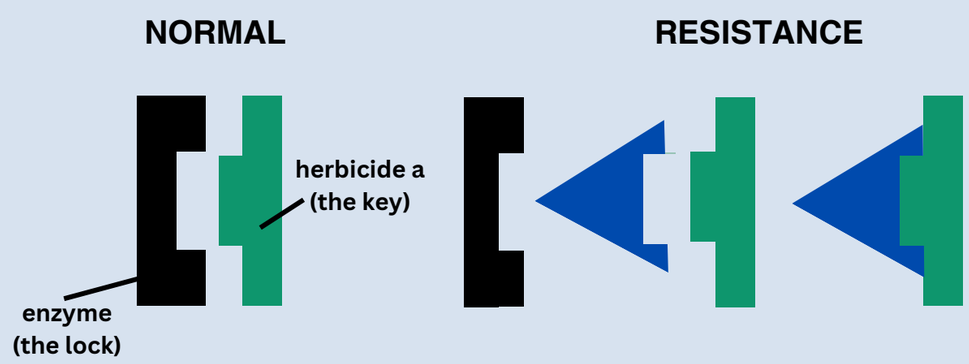
Herbicide resistance is the inherited ability of a plant to survive and reproduce following exposure to a dose of herbicide normally lethal to the wild type.

TYPES OF RESISTANCE

Resistance occurs when the processes required for the herbicide to work are modified.

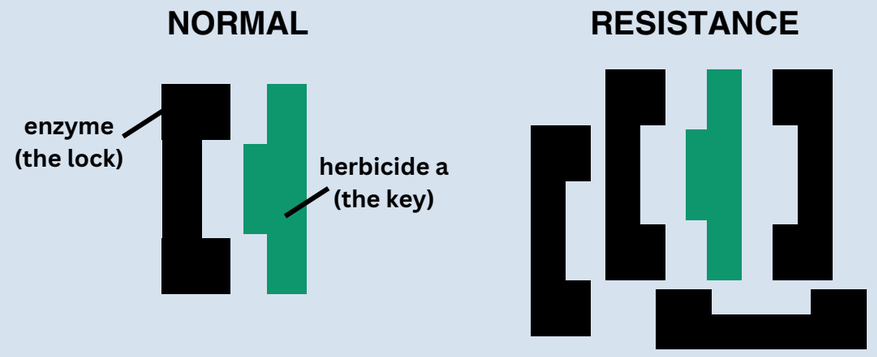
- Some of the processes by which resistance occurs can be compared to a lock and key. The key will not work on the lock anymore if:
  i. The lock is slightly modified (Altered Target Site)
  ii. There are too many locks and only one key (Upregulation of Target Site)
  iii. The key is broken (Metabolic)
  iv. The key is put away somewhere it is not accessible (Compartmentalization)
  v. The key is not able to be used in all the locks throughout the house (Reduced Translocation)
  vi. The key is not able to be inserted into the lock because something is blocking the entrance (Reduced Absorption)

COMPARTMENTALIZATION (PUT AWAY KEY)



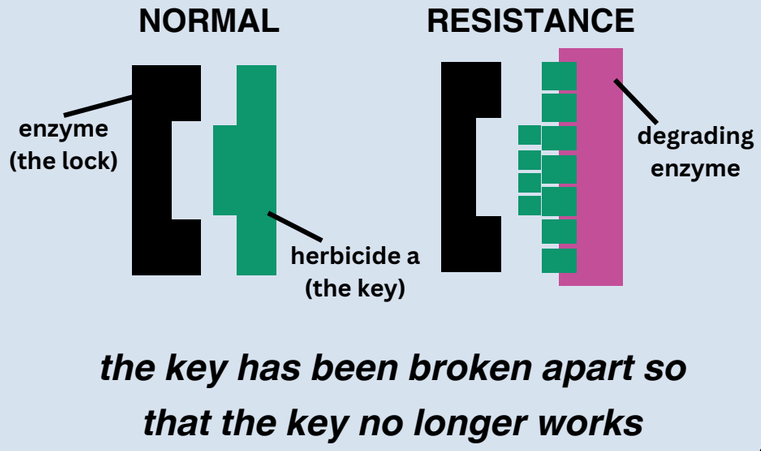
the key has been put away in a bag so that the key no longer can be used

UPREGULATION OF TARGET-SITE (INCREASED NUMBER OF LOCKS)



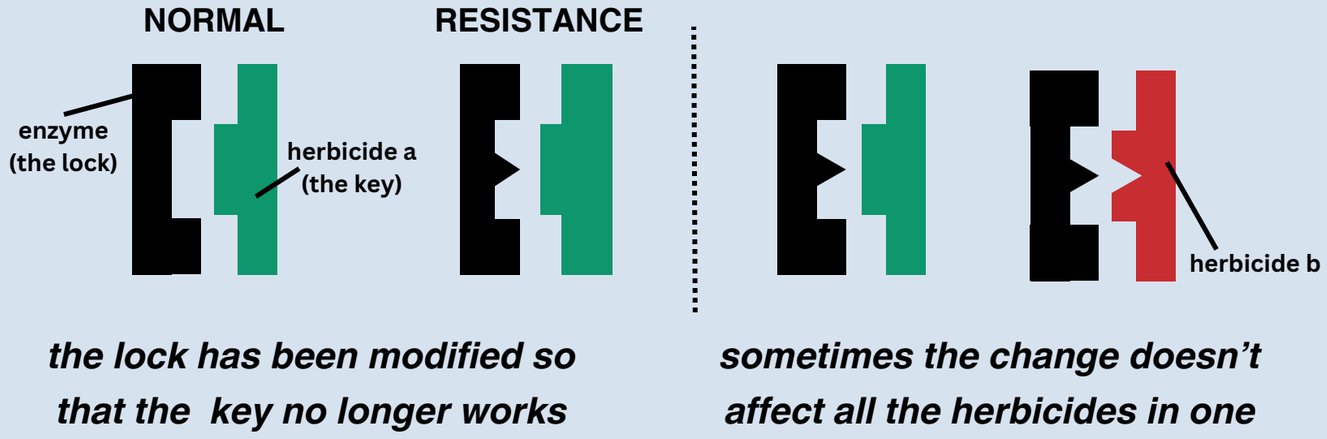
only one key but a lot of locks

METABOLIC (BROKEN KEY)



the key has been broken apart so that the key no longer works

TARGET-SITE (MODIFIED LOCK)



the lock has been modified so that the key no longer works

sometimes the change doesn't affect all the herbicides in one group

There are many mechanisms of resistance. You can't tell by looking at a resistant plant which mechanism it has. However the mechanism is important as it determines if the resistance is to one herbicide, one herbicide mode of action, or multiple modes of action.

RESOURCES

1. https://doi.org/10.1074%2Fjbc.REV120.013572
2. https://doi.org/10.3390%2Fplants8100382
3. https://doi.org/10.3390%2Fplants8100417

FUNDED BY:

WGRF ALBERTA CANOLA PRODUCERS COMMISSION

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