A EFICÉNCIA DA IRRIGACIÓN EM FERTIRRIGACIÓN COM A BOA NUTRICIÓN DOS CULTIVOS

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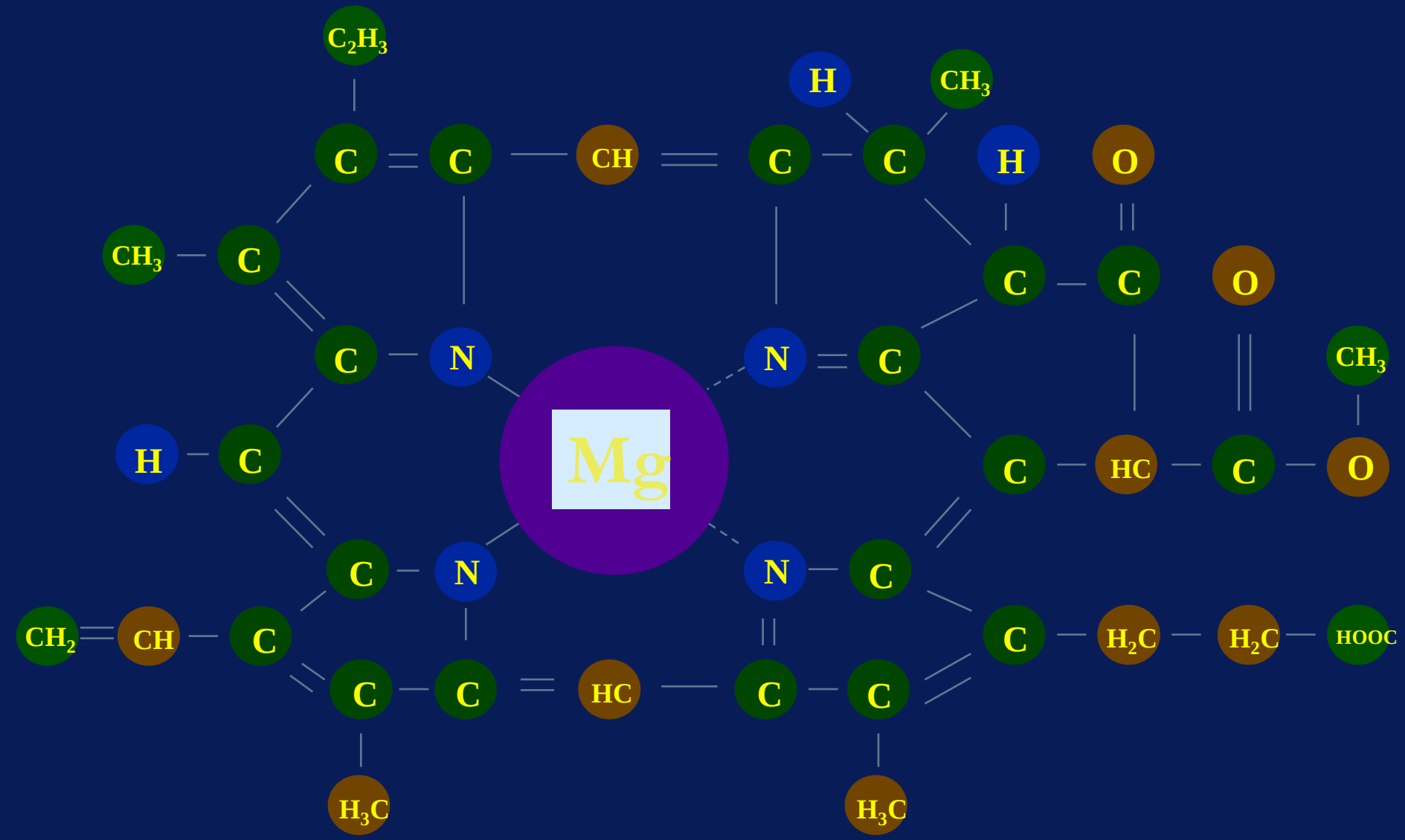
AGROBIOLAB Cía. Ltda.

Con Calidad ISO 17025

Similitudes entre los seres vivos

- La fórmula de la clorofila es:
- $C_{55}H_{72}O_5N_4Mg$
- La fórmula de los hematies es:
- $C_{34}H_{33}O_5N_4Fe$
- El **Mg** es un elemento muy importante en la planta y el **Fe** es en el hombre y los animales.

MOLECULA DE CLOROFILA




MEDIANTE LA EXTRACCION
DE NUTRIENTES
DE LOS CULTIVOS


BABACO
3 MESES

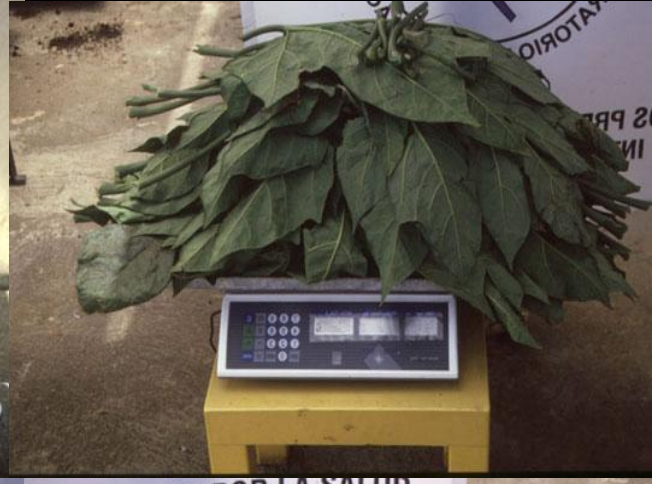

BABACO
6 MESES
ECUADOR 13 10 1999


BABACO
6 MESES
ECUADOR 13 10 1999


BABACO
9 MESES


BABACO
12 MESES
ECUADOR 13 10 1999


BABACO
15 MESES
ECUADOR 13 10 1999



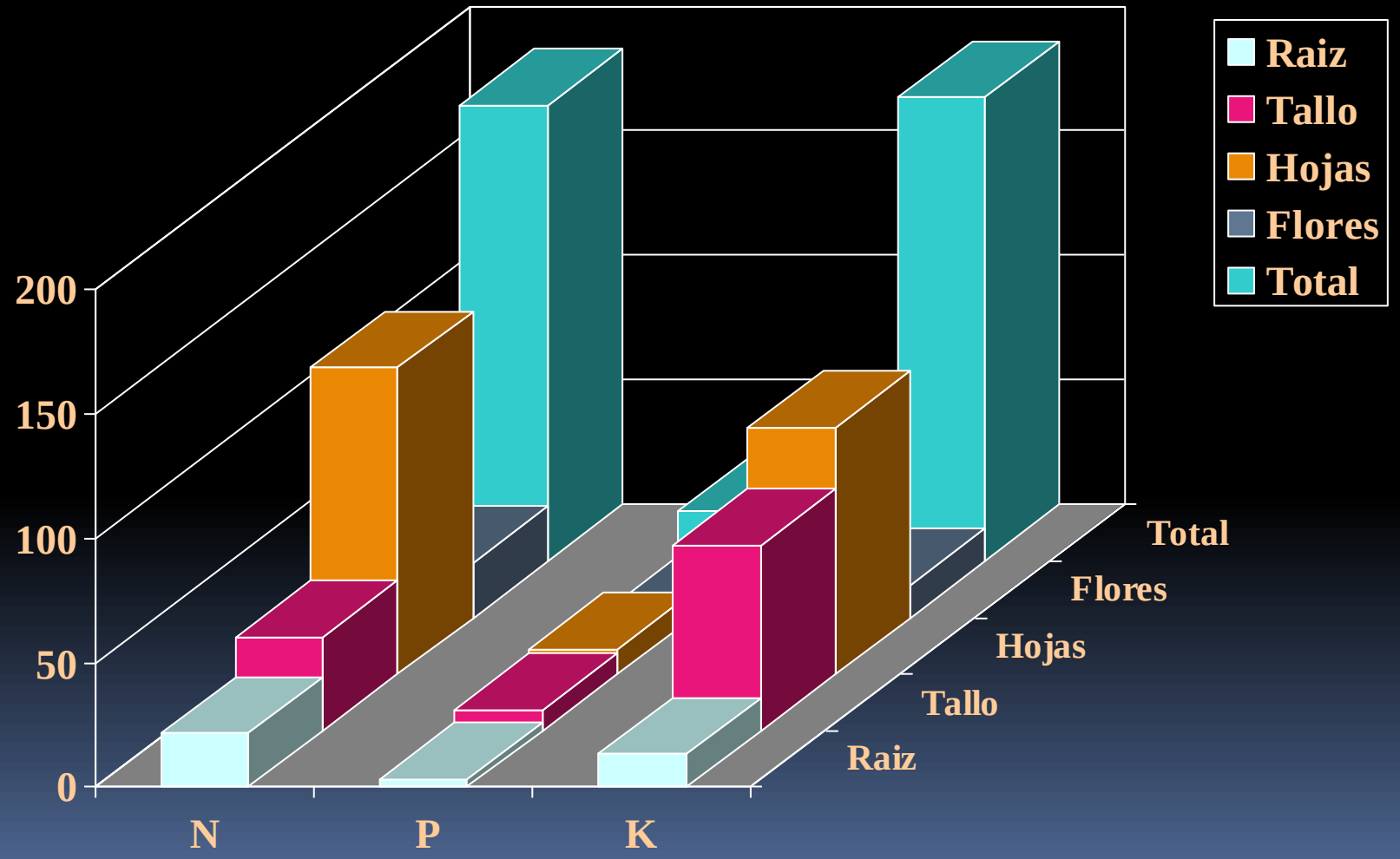

CLINICA AGRICOLA


EOCUPAMOS POR LA SALUD
GRAL DE LOS VEGETALES


ORATORIO DE INVE
REOCUPAM
TEGRAL D


ORATORIO DE INVES
PREOCUPAM
TEGRAL DE

Extracción de Nutrientes



FERTILIZACION EDÁFICA DE BASE y FERTIRRIEGO DE COMPLEMENTO

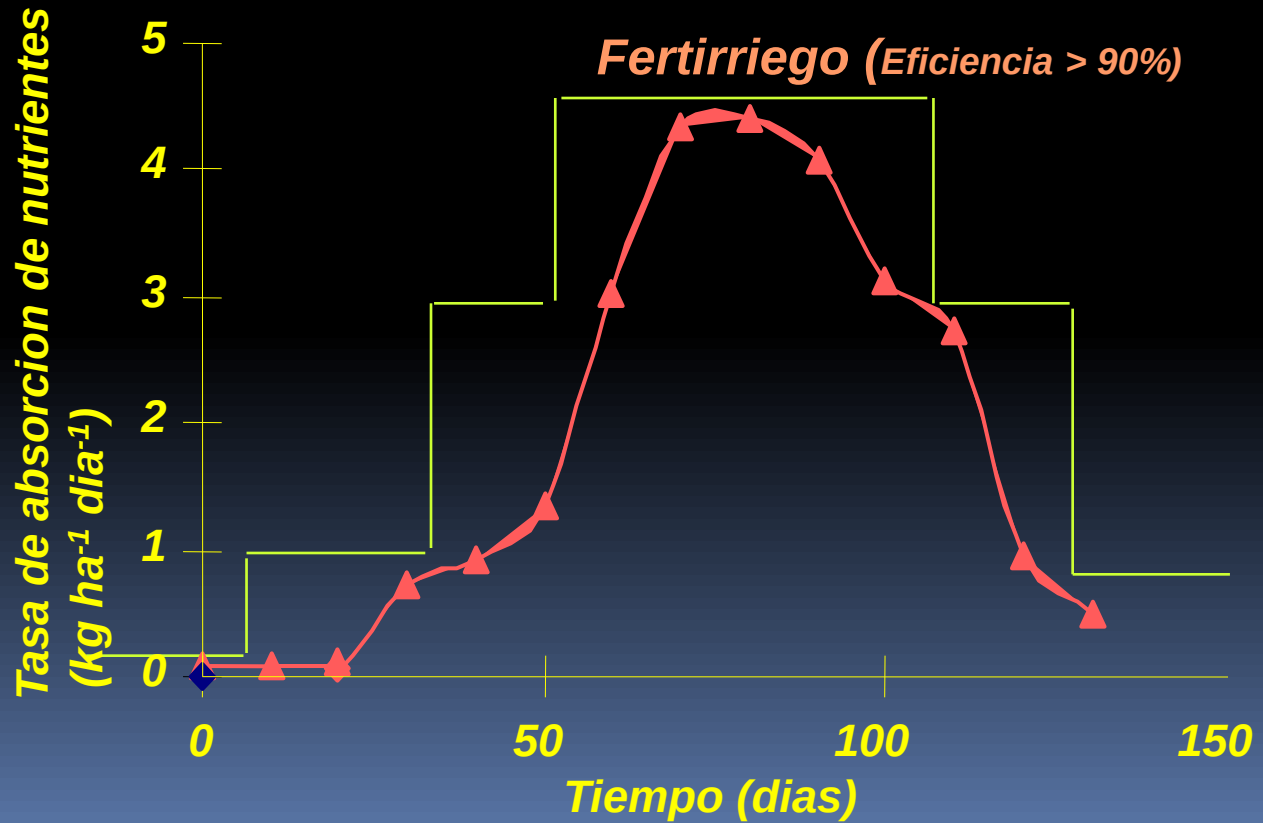
APLICACION DE NUTRIENTES

fertilizacion de base

361 kg N

Se deben considerar PERDIDAS:
Lavado
Volatilizacion

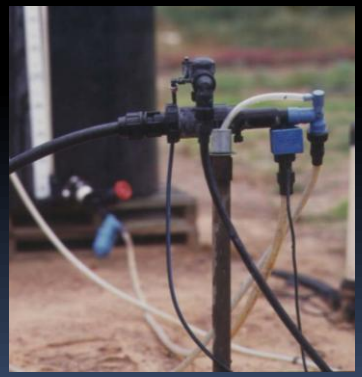
Eficiencia 50%?



COMO NUTRIR A LOS CULTIVOS ?

- Edáficamente aplicación sólida y luego irrigar.

- Disueltos en el agua (Ferirrigación)



FERTIRRIEGO = FERTI LIZACION + RIEGO

FÓRMULA PARA DOSIS DE FERTILIZACIÓN

$$\text{Dósis de fertilizante} = \frac{\text{Extracción del cultivo - Aporte del suelo}}{\text{Eficiencia del uso y manejo del fertirriego}}$$

Cálculo del abastecimiento del N del suelo

A = 2 (ppm x da)

A = 2 (67 x 1.2) = 161 kg/ha

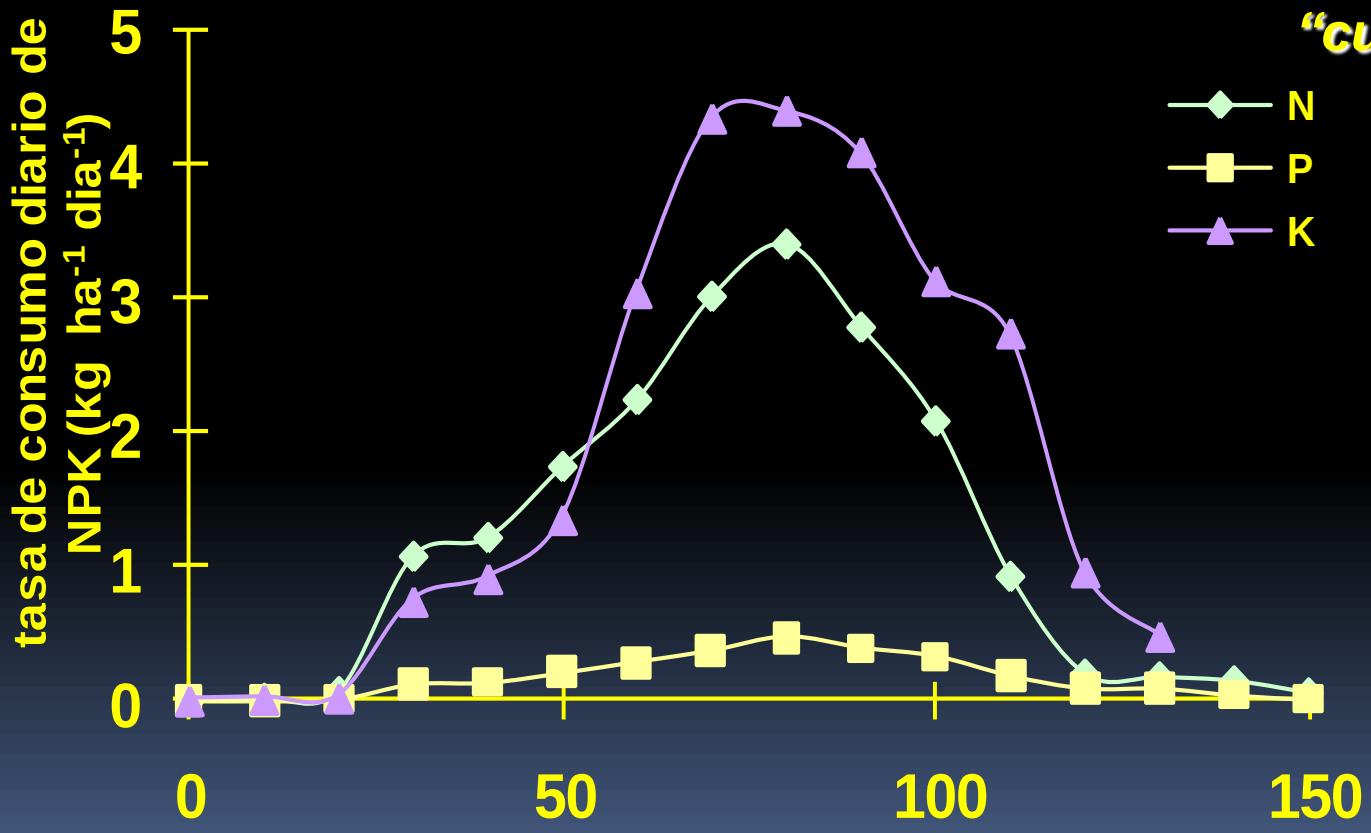
Se calcula la dosis de N a ser aplicada:

Dosis de N = (D - A) / % eficiencia

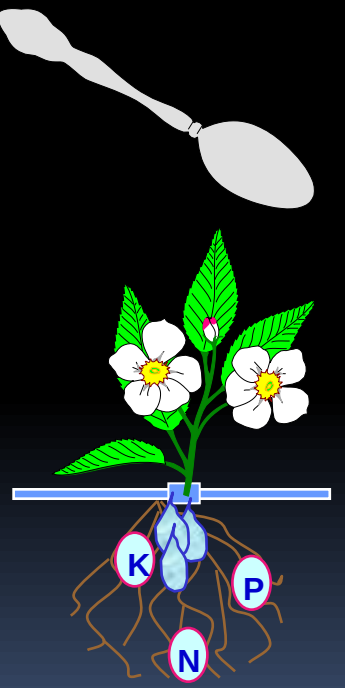
Dosis de N = (361 - 161) / 0.95 = 210 kg/ha

PROGRAMACION DEL FERTIRRIEGO

APLICACION DE AGUA Y NUTRIENTES DE ACUERDO AL RITMO DE EXTRACCION DE LA PLANTA



"cuchara a cuchara"



Si la recomendación es dada en ppm´s

N = 38.61 ppm Fuente NO3NH4 33% N
P = 33.43 ppm Fuente DAP 46 % P2O5
K = 97.60 ppm Fuente ClK 60 % K2O

$\frac{38.61}{0.33}$ = 117 kg /m^3 /1000 = 0.117 g/l

Lámina de agua 3 mm = 30m^3

0.117 x 30 = 3.51 kg/ha/riego

0.073 x 30 = 2.18 kg/ha/riego

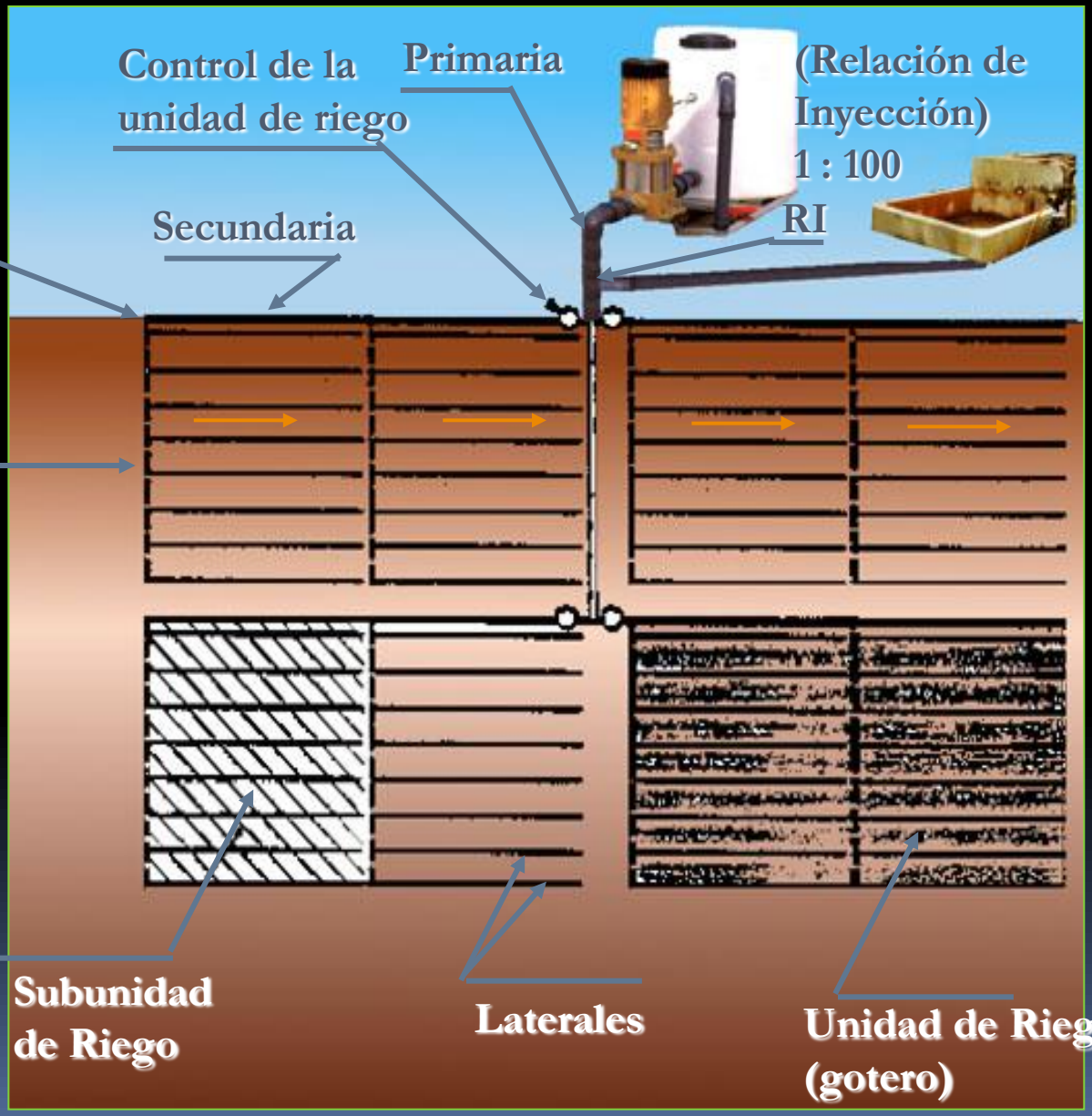
0.163 x 30 = 4.88 kg/ha/riego

Relación de inyección o grado de dilución

$$\text{Relación de inyección} = \frac{\text{Volumen Total}}{\text{Volumen del tanque}}$$

$$\text{Volumen del tanque} = \frac{30\,000 \text{ lts}}{100} = 300 \text{ lts}$$

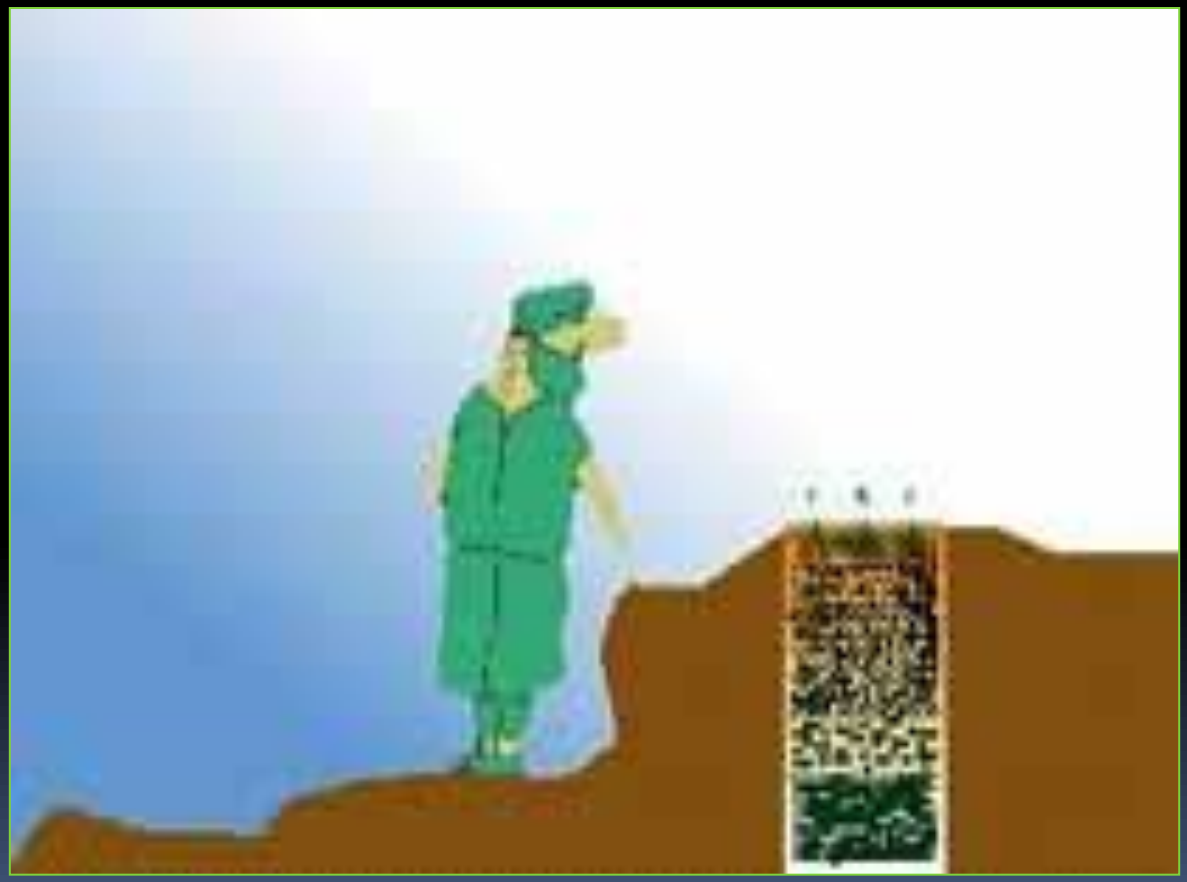
DISTRIBUICIÓN DEL FERTILIZANTE EN EL CAMPO



Un mundo de alimentos en nuestras manos

GRUPO CLINICA AGRICOLA
LABORATORIO DE INVESTIGACIONES

TRANSFORMÉMONOS EM MÉDICOS DEL SUELO



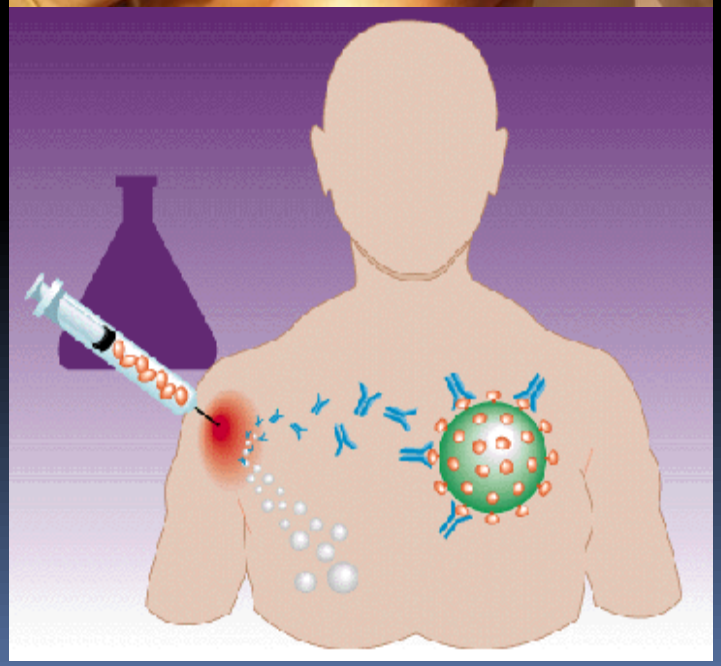
Maletín de Primeros Auxilios

Clínica Agrícola

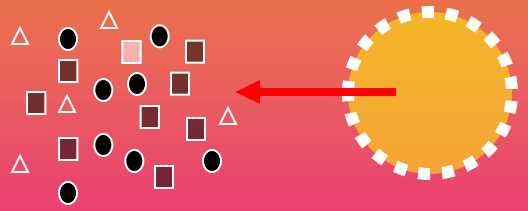
KIT DE ANALISIS EN EL CAMPO

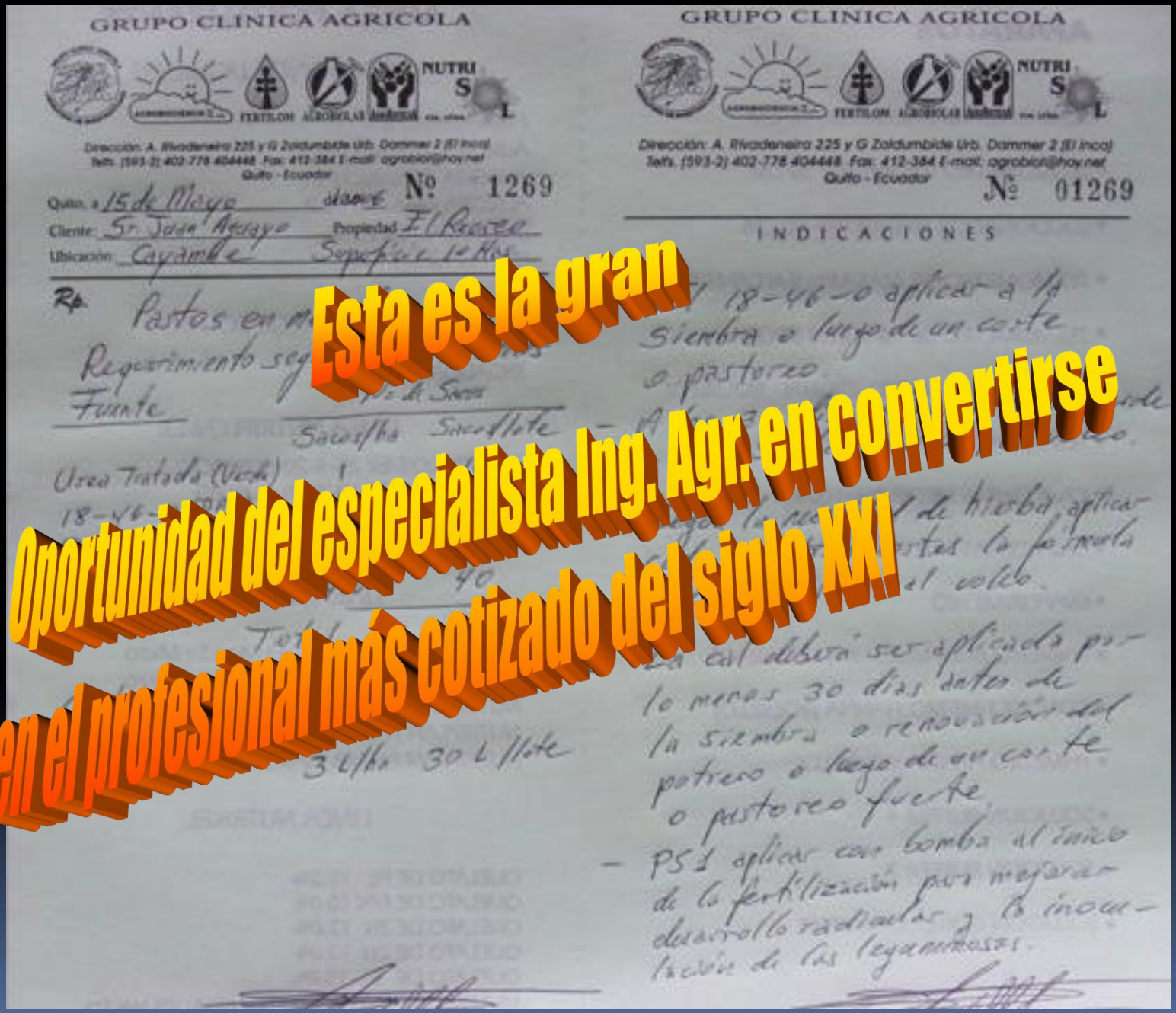
Cloruros Nitratos C. E. pH

Y COMO MÉDICOS DE LAS PLANTAS



Inactive defenses

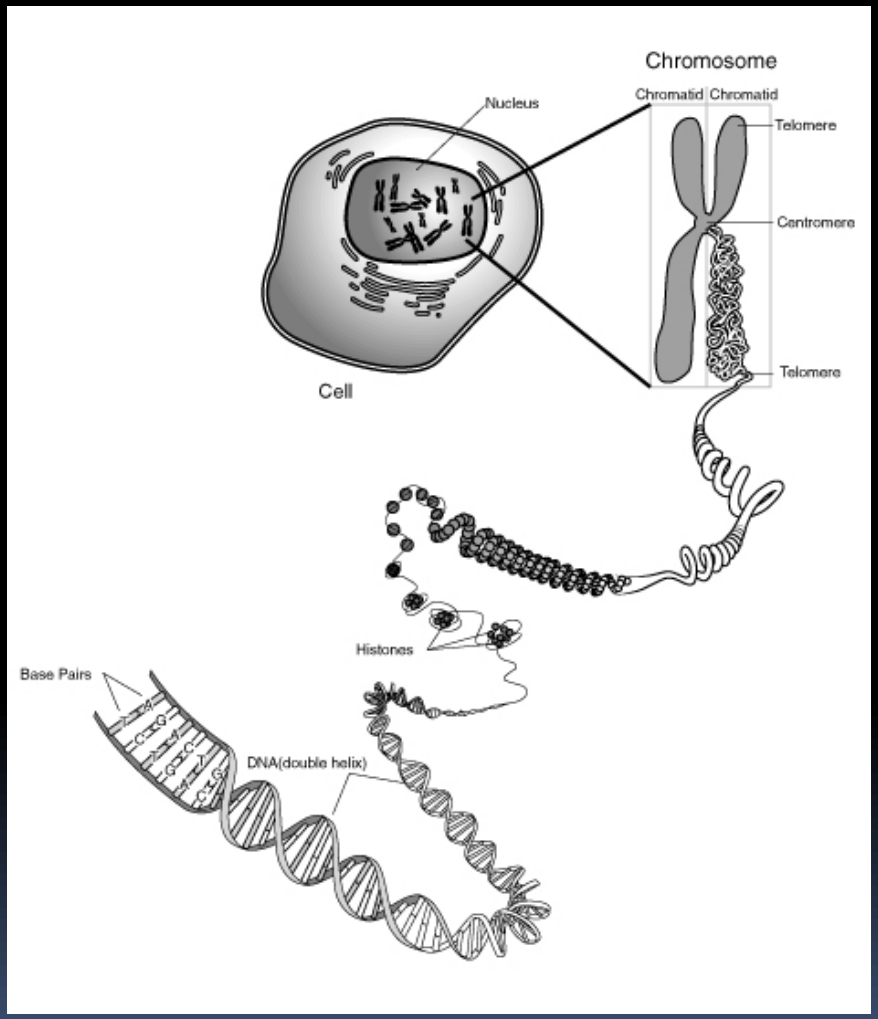


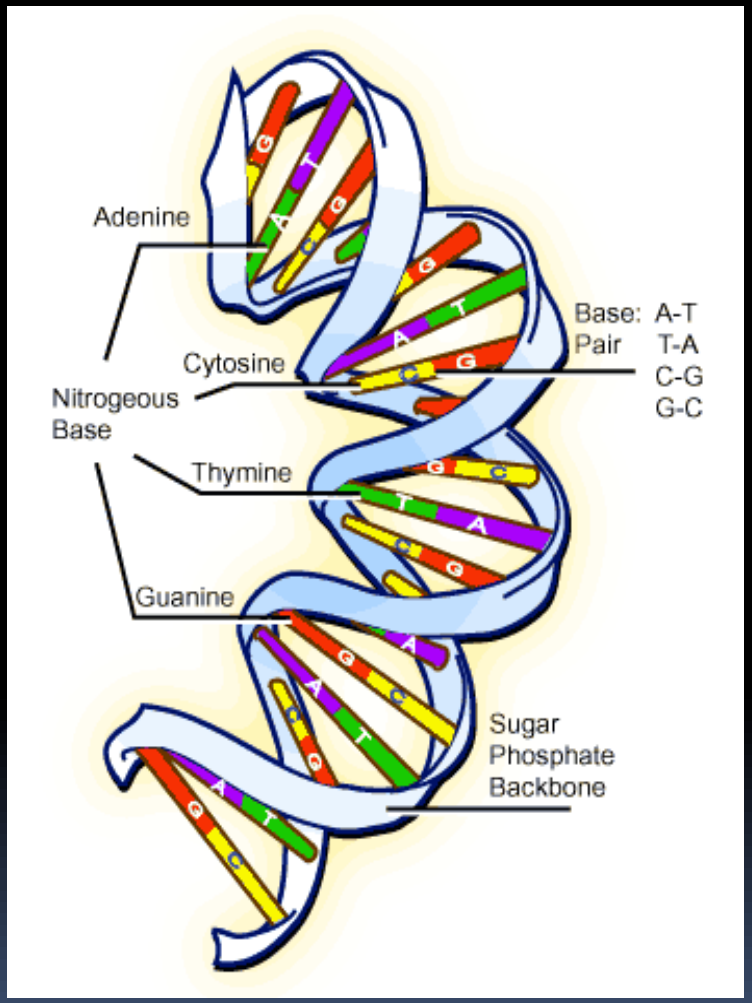


Esta es la gran Oportunidad del especialista Ing. Agr. en convertirse en el profesional más cotizado del siglo XXI

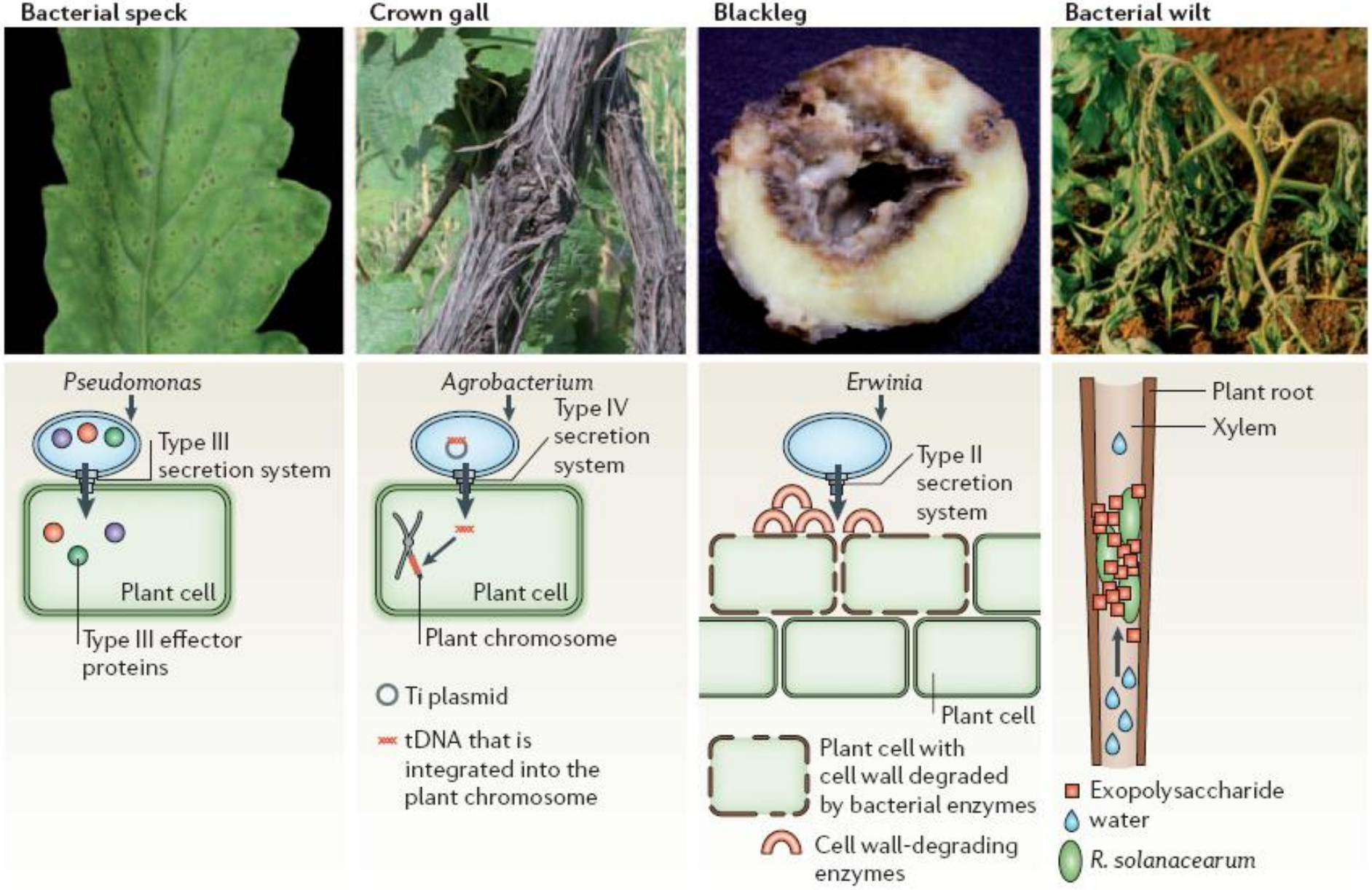
Métodos de control de plagas y enfermedades

CODIGO GENETICO





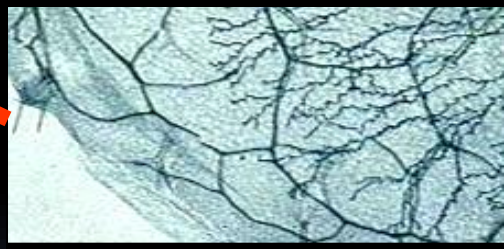
GENOMA VEGETAL


Bacterial speck
Crown gall
Blackleg
Bacterial wilt
Pseudomonas
Type III secretion system
Plant cell
Type III effector proteins
Agrobacterium
Type IV secretion system
Plant cell
Plant chromosome
Ti plasmid
tDNA that is integrated into the plant chromosome
Erwinia
Type II secretion system
Plant cell
Plant cell with cell wall degraded by bacterial enzymes
Cell wall-degrading enzymes
Plant root
Xylem
Exopolysaccharide
water
R. solanacearum

Arabidopsis thaliana **es el conejillo de indias de los vegetales**

virus

bacteria



hongos

insectos

Planta modelo: *Arabidopsis thaliana*

Brassicaceae

Over 100 other genera

Brassica

Raphanus

Vol 444|16 November 2006|doi:10.1038/nature05286

nature

REVIEWS

The plant immune system

Jonathan D. G. Jones[1] & Jeffery L. Dangl[2]

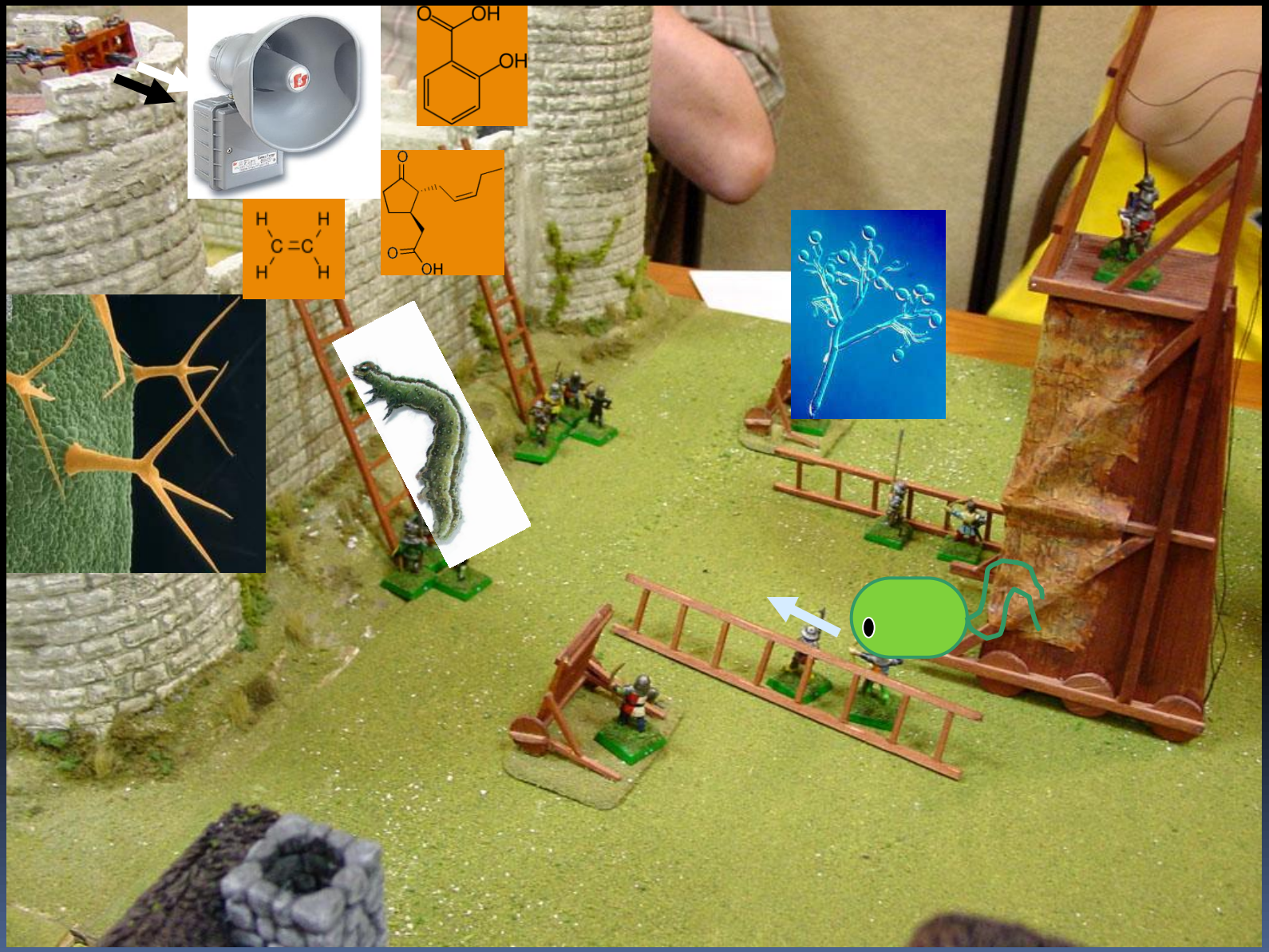
Many plant-associated microbes are pathogens that impair plant growth and reproduction. Plants respond to infection using a two-branched innate immune system. The first branch recognizes and responds to molecules common to many classes of microbes, including non-pathogens. The second responds to pathogen virulence factors, either directly or through their effects on host targets. These plant immune systems, and the pathogen molecules to which they respond, provide extraordinary insights into molecular recognition, cell biology and evolution across biological kingdoms. A detailed understanding of plant immune function will underpin crop improvement for food, fibre and biofuels production.

Introduction

Plant pathogens use diverse life strategies. Pathogenic bacteria proliferate in intercellular spaces (the apoplast) after entering through gas or water pores (stomata and hydathodes, respectively), or gain access via wounds. Nematodes and aphids feed by inserting a stylet

important abbreviations. In phase 1, PAMPs (or MAMPs) are recognized by PRRs, resulting in PAMP-triggered immunity (PTI) that can halt further colonization. In phase 2, successful pathogens deploy effectors that contribute to pathogen virulence. Effectors can interfere with PTI. This results in effector-triggered susceptibility (ETS).

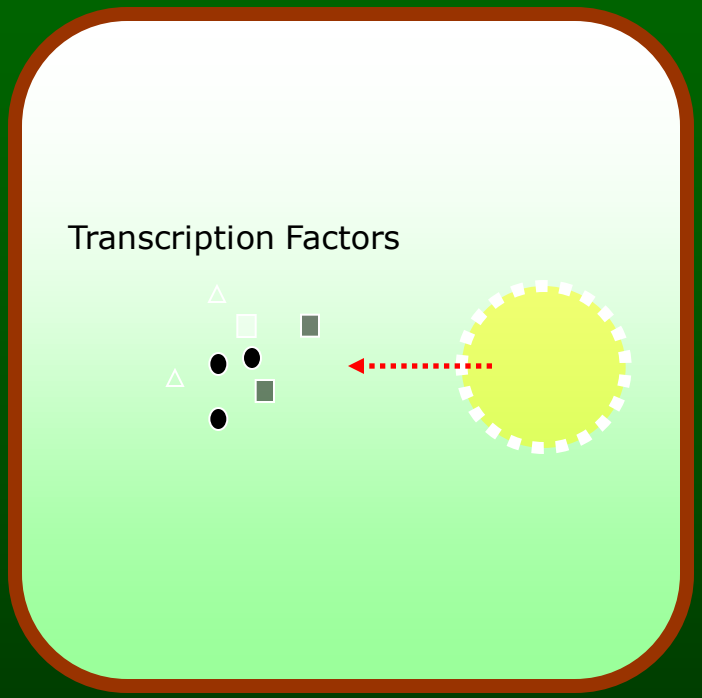
Defensa natural y defensa inducida



Los Endoelicitores se producen así:

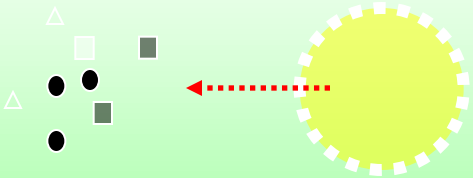
- Hongos y bacterias entran en contacto con las plantas.
- Enzimas hidrolíticas rompen las membranas de hongos y bacterias.
- Los fragmentos de su membrana están compuestos por polisacáridos que se los denominan elicitores internos.
- Estos activan los mecanismos de defensa, las fitoalexinas, que son producidas por productos secundarios de la planta.

Non-primed



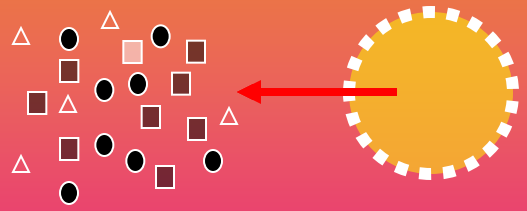
Non-primed

Transcription Factors

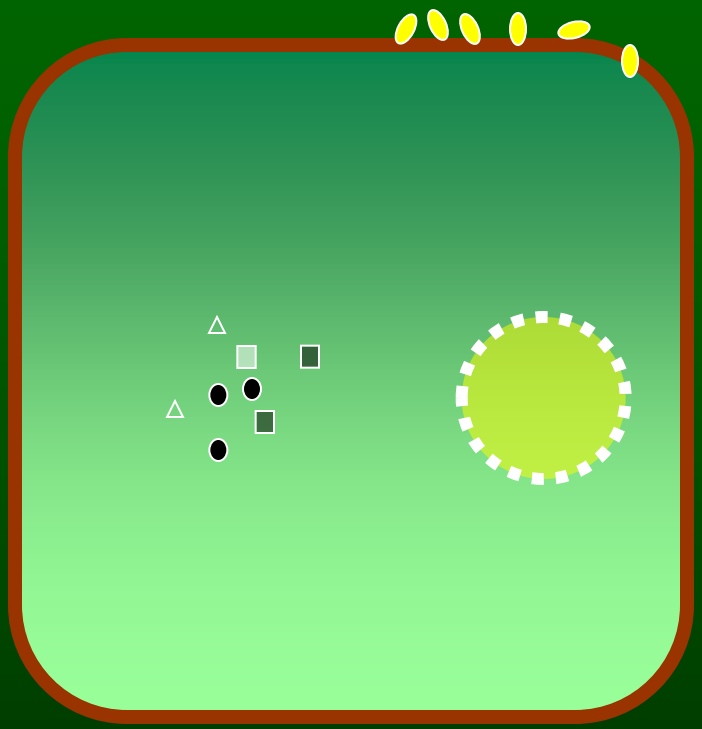


Primed

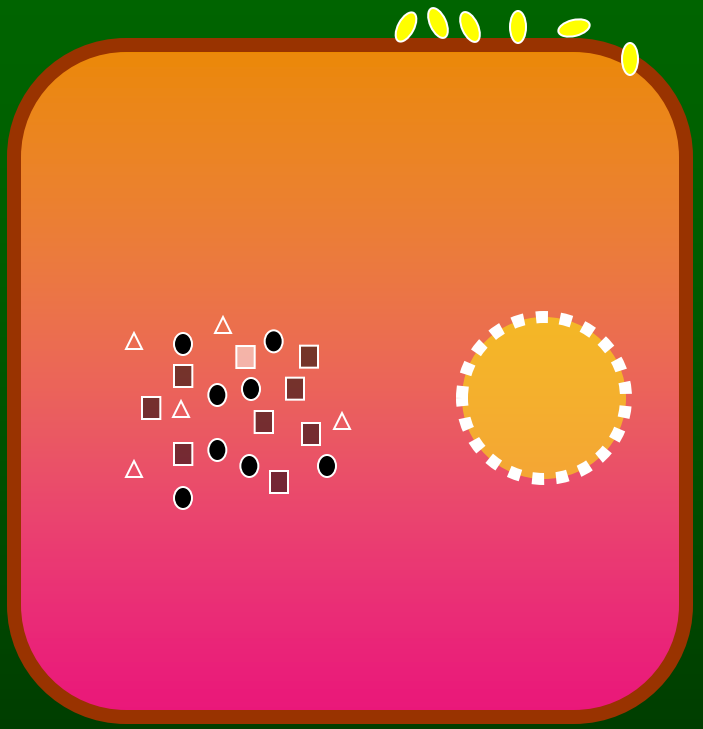
Transcription Factors



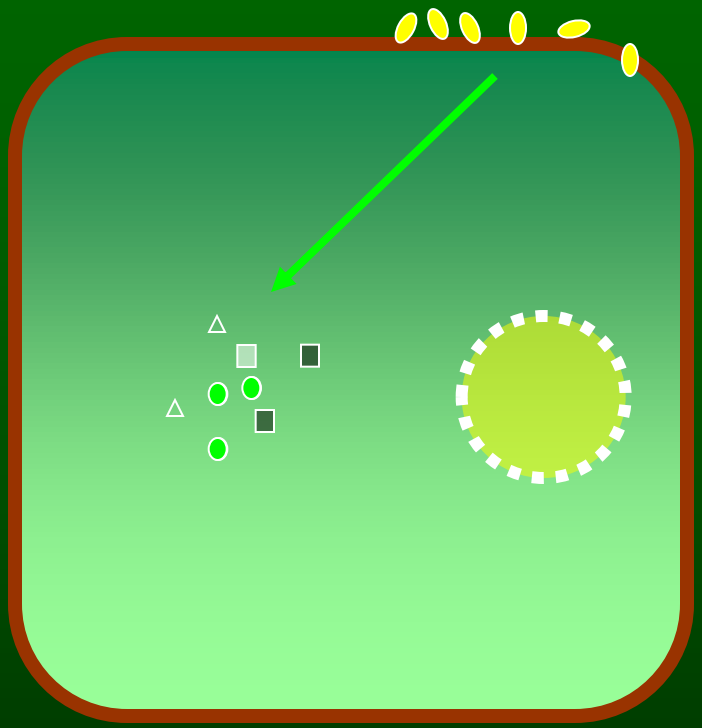
pathogen



pathogen



pathogen



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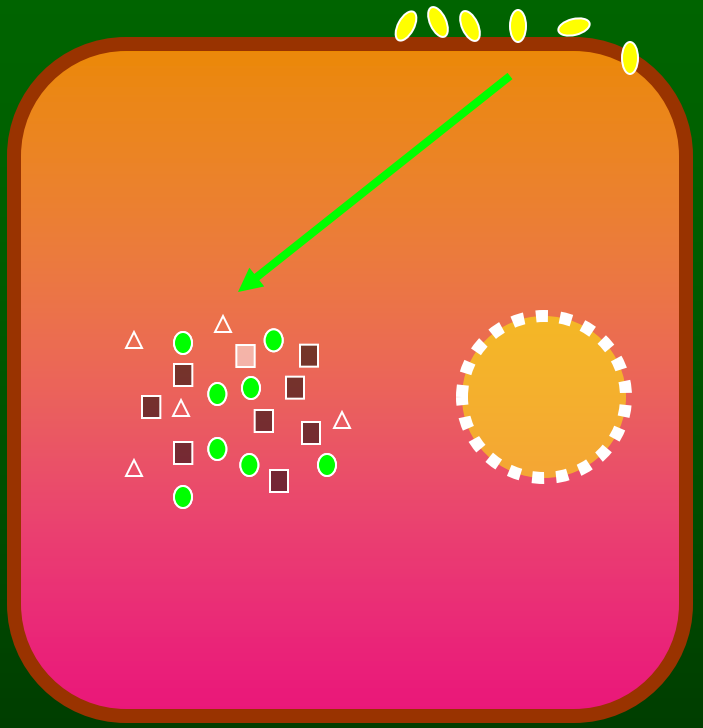
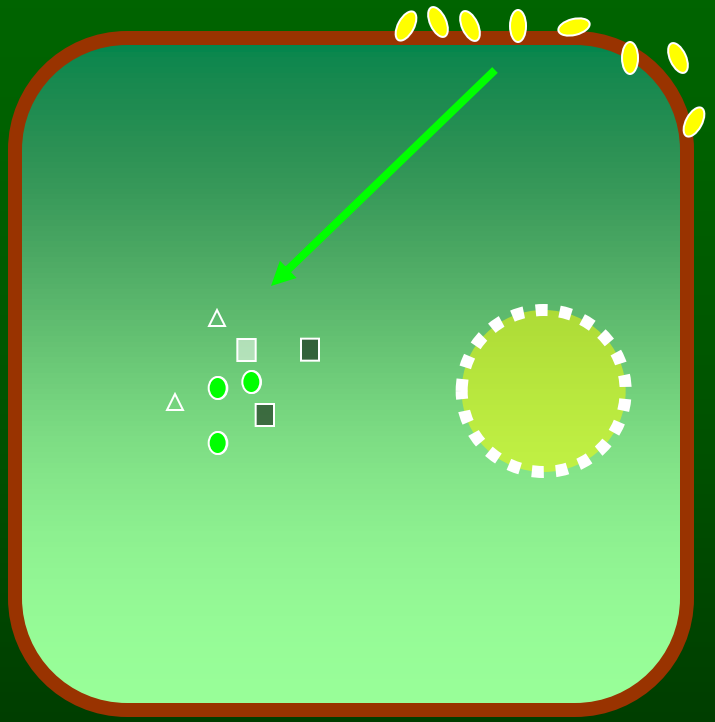


pathogen



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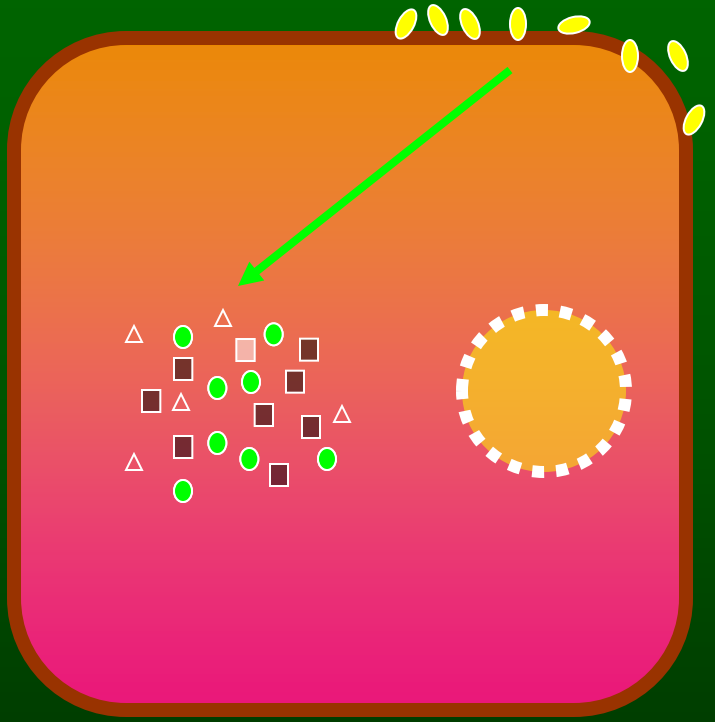

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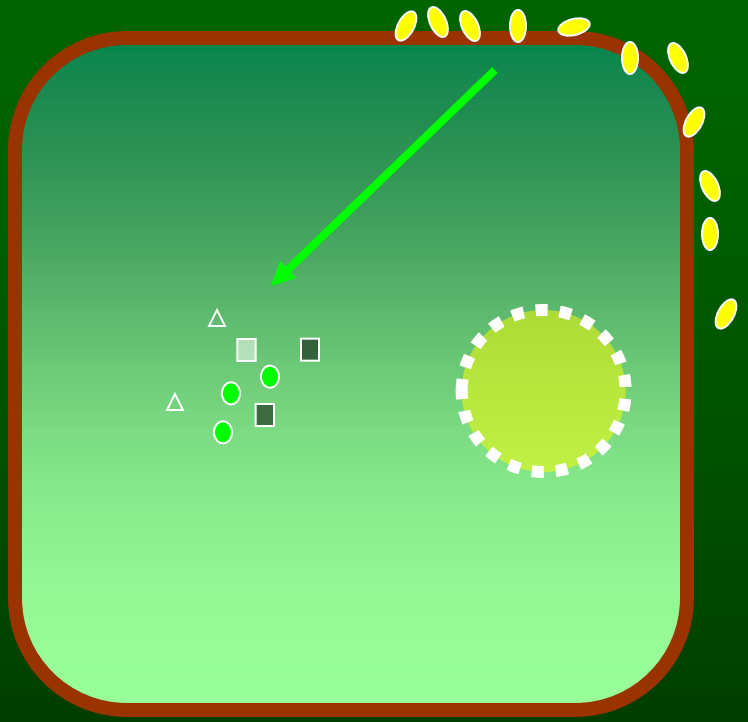

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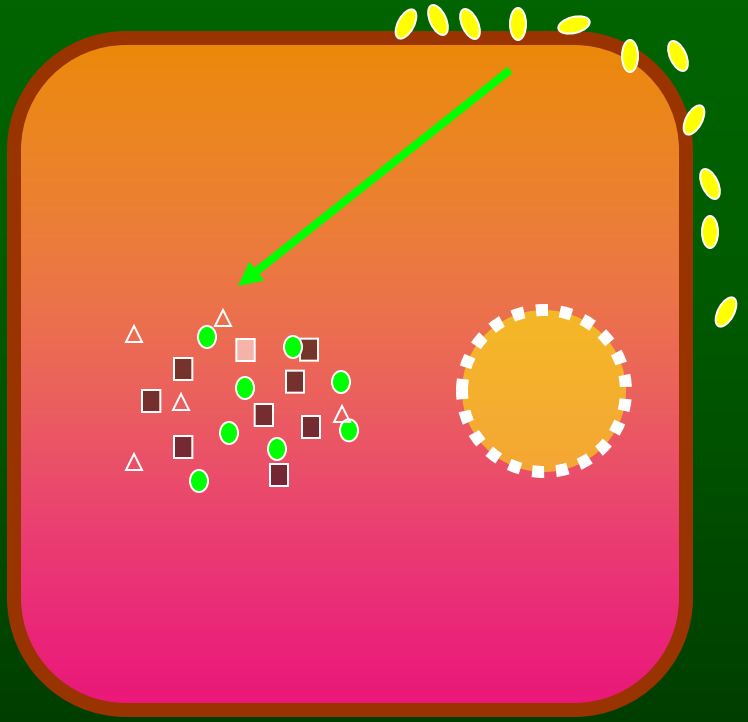

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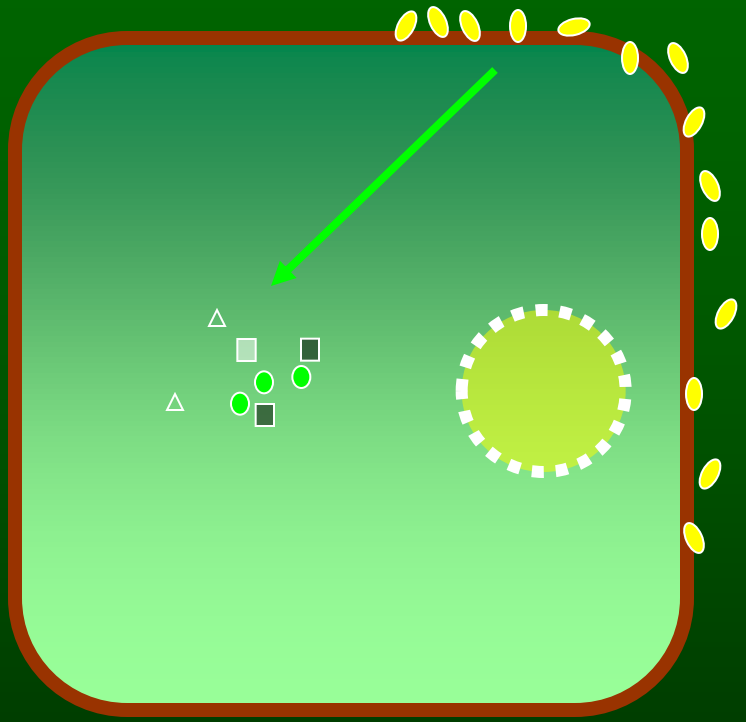

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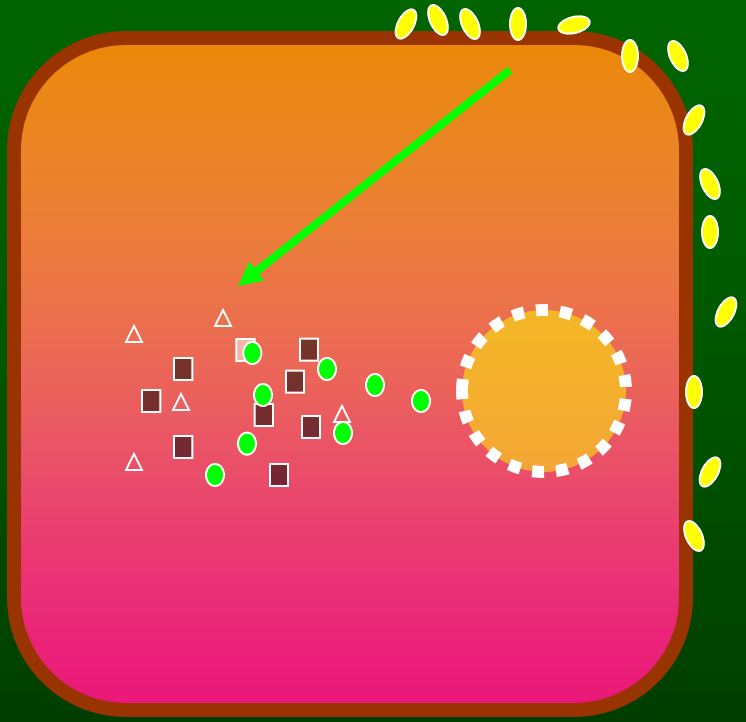

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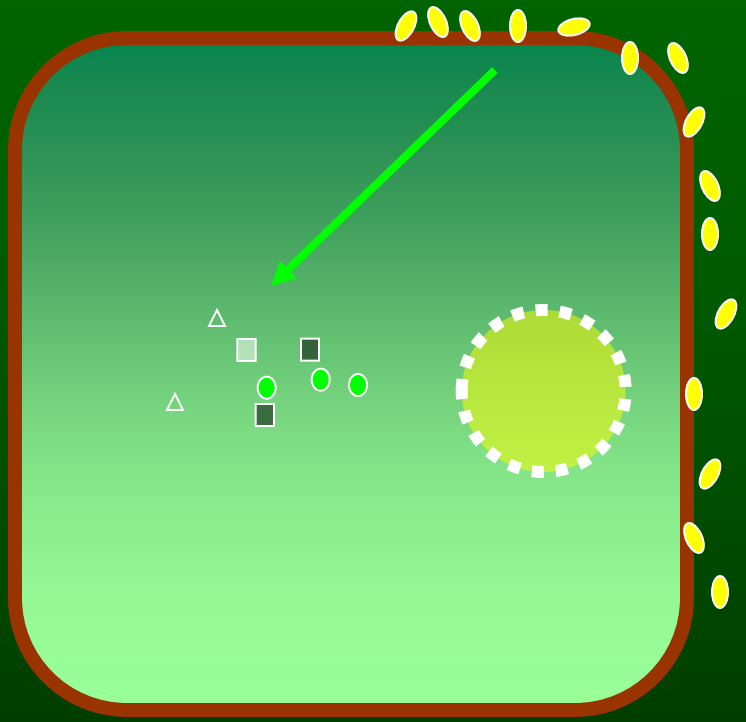

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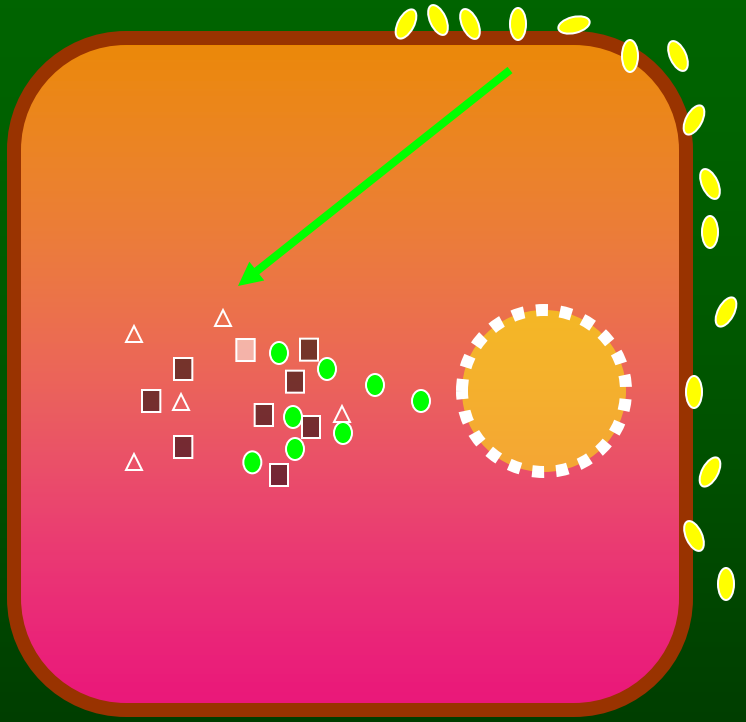

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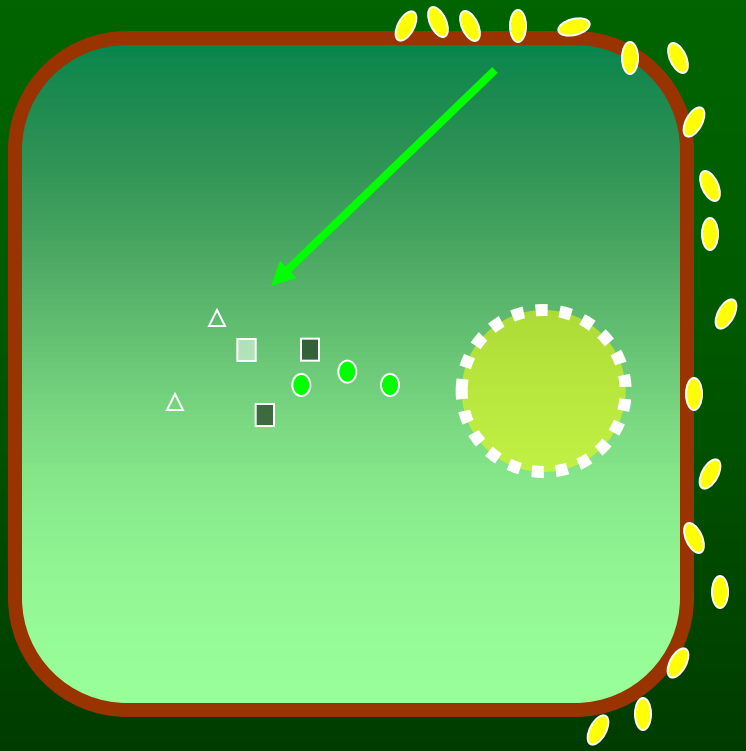

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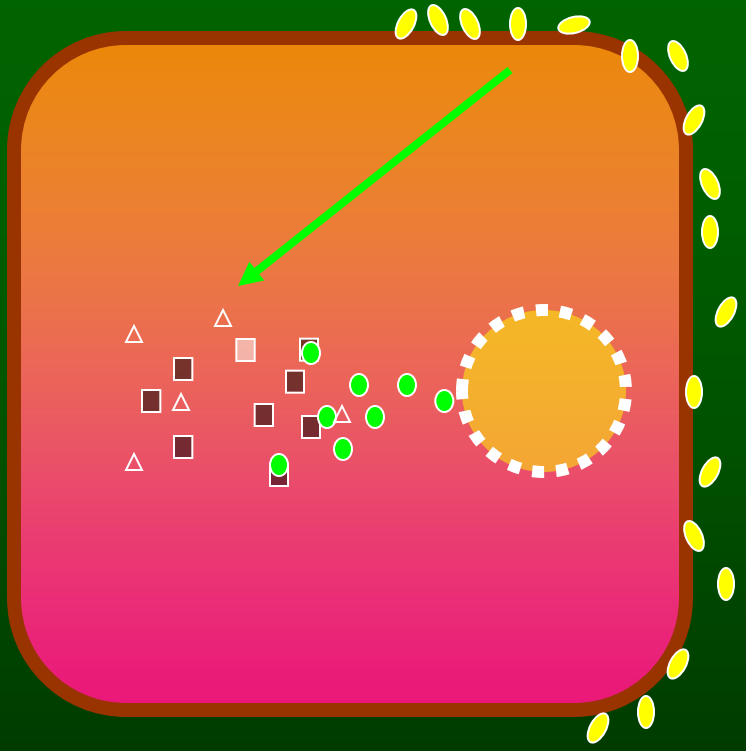

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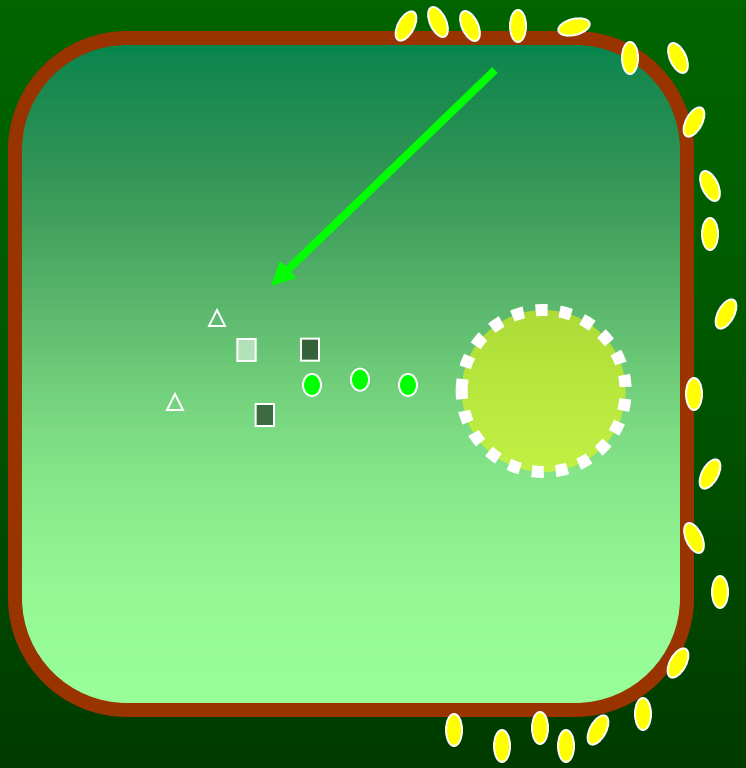

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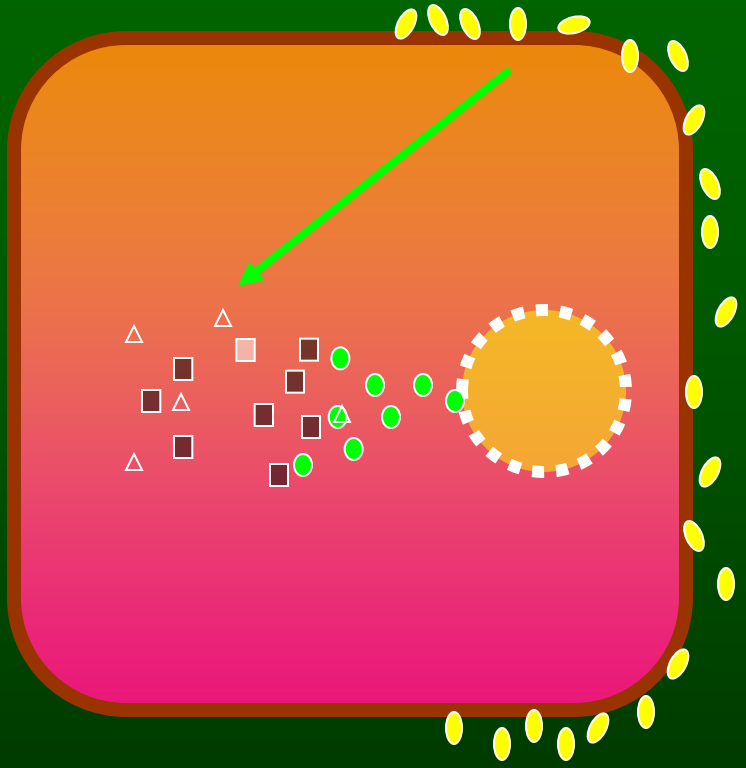

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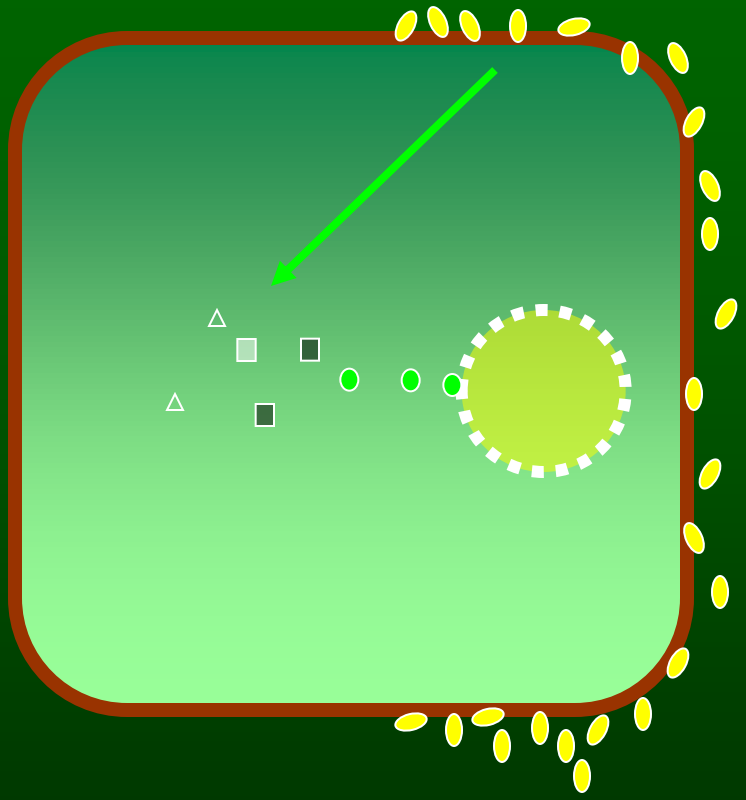

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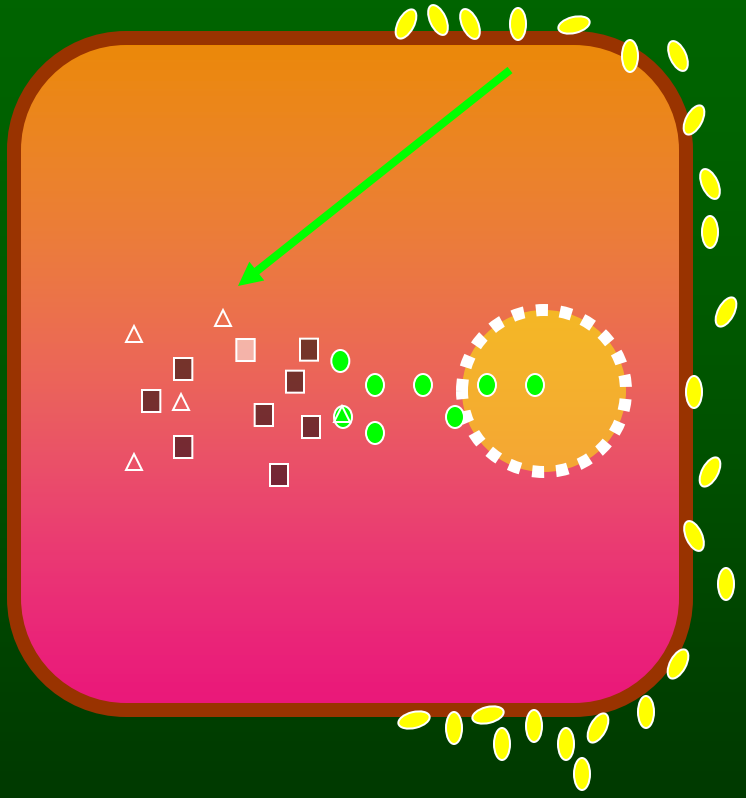

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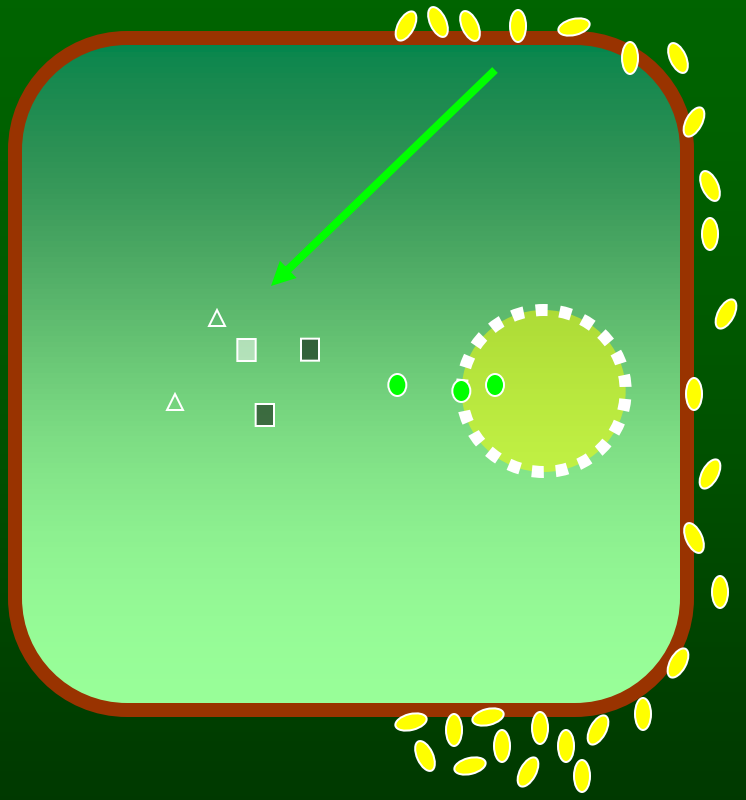

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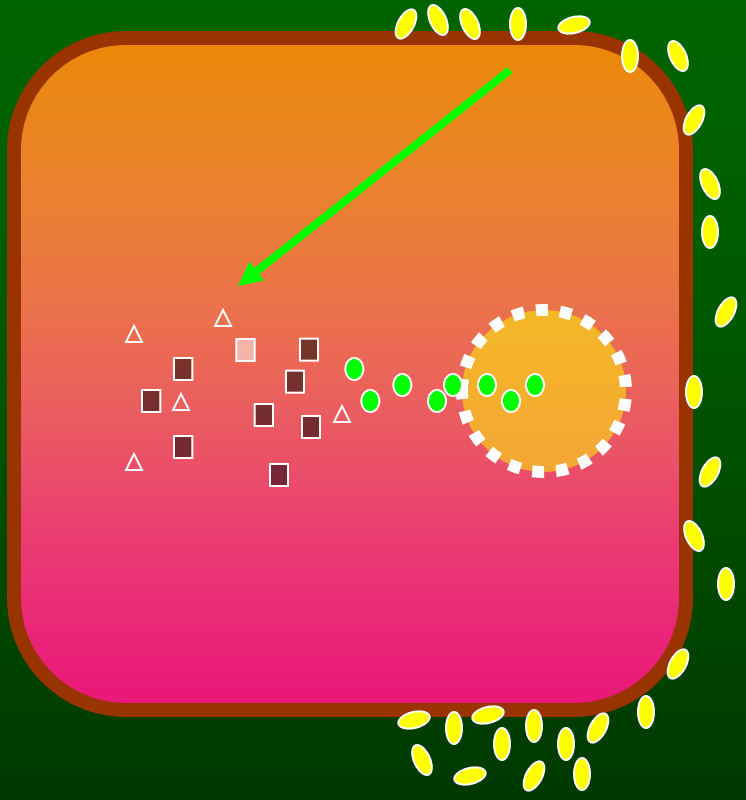

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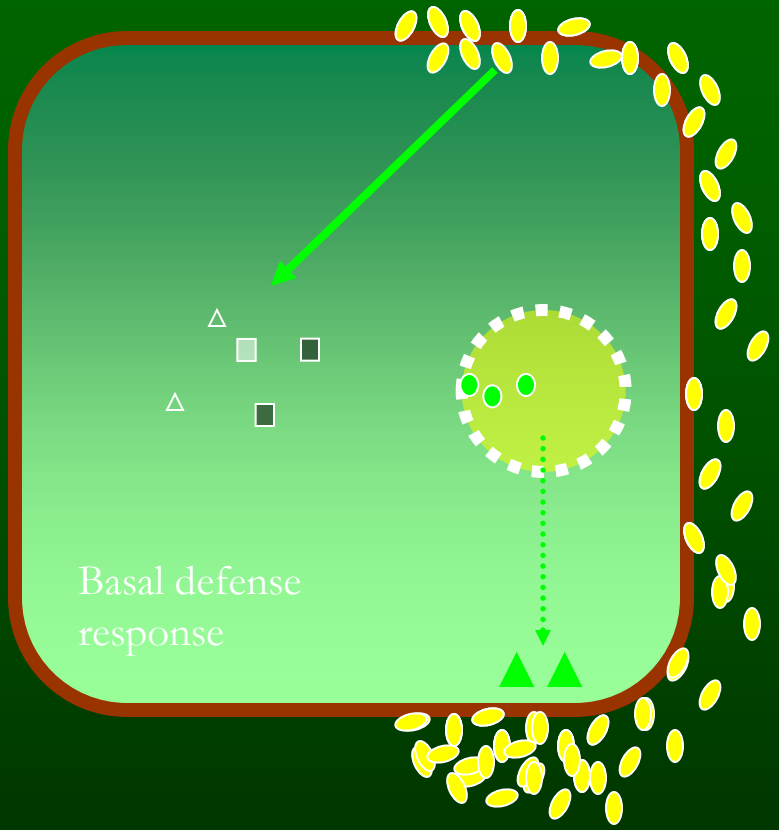


pathogen

Inicio de infección

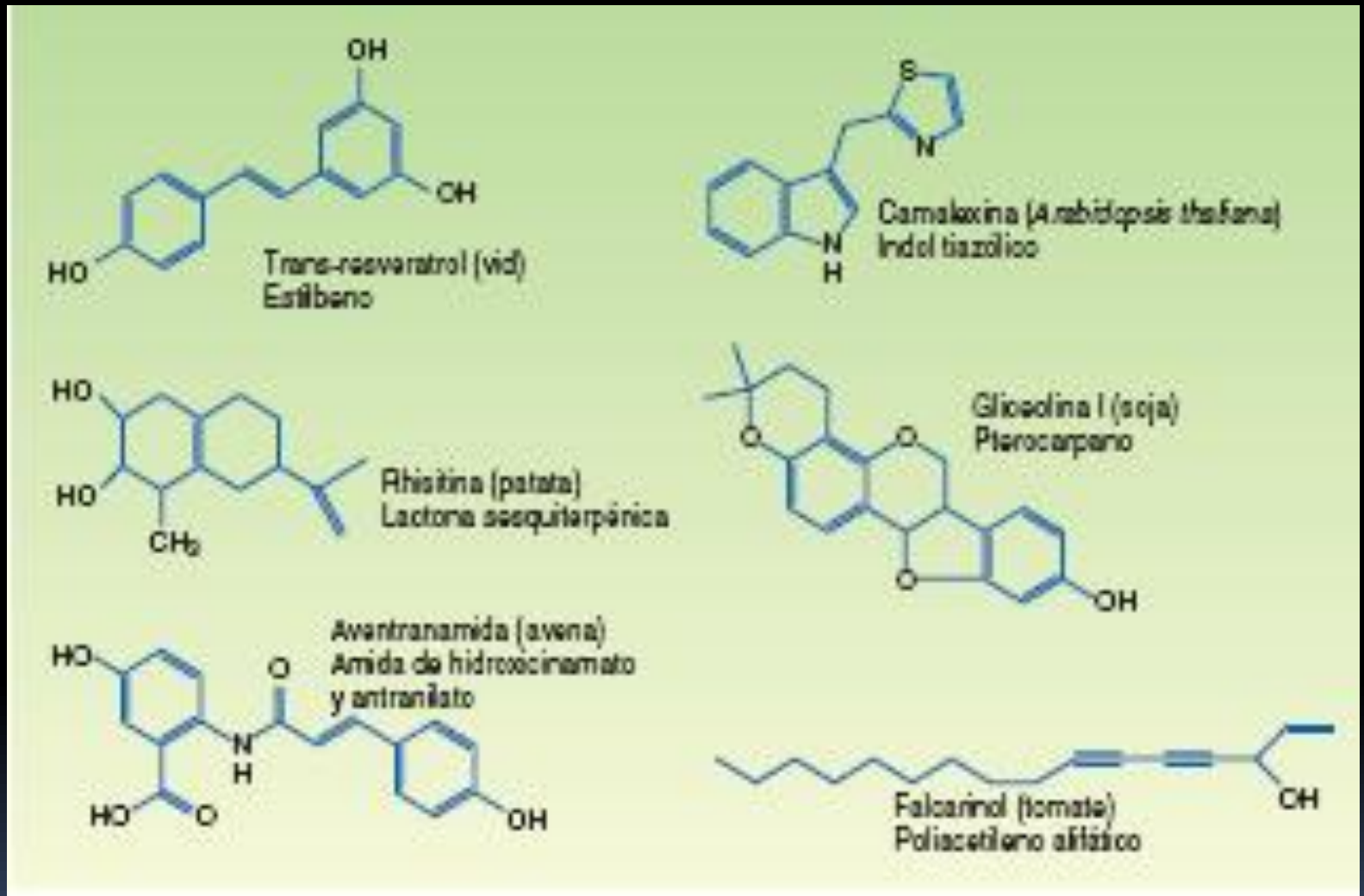
Respuesta de la planta a la infección


Avance de la infección


Necrosis de tejidos

Fitoalexinas……..

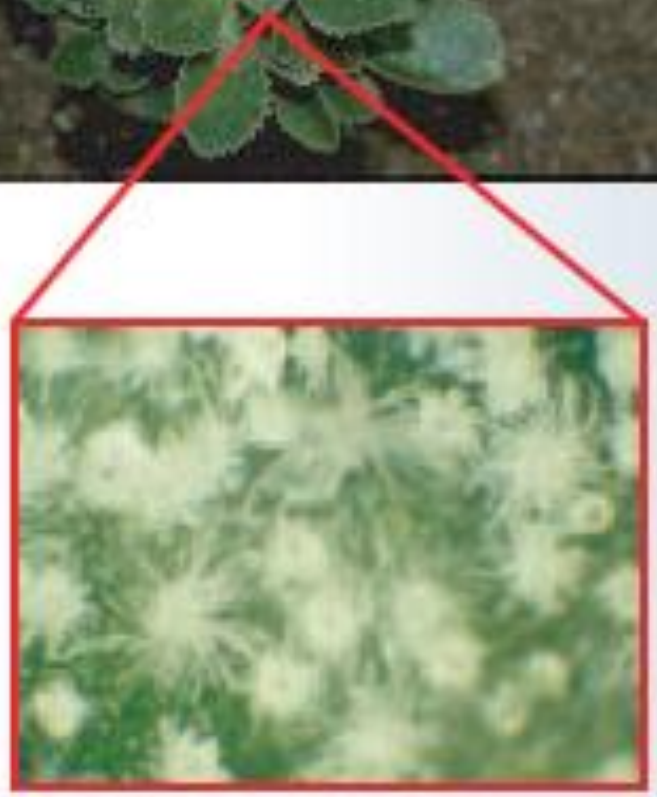
- **Son sustancias producidas por las plantas como mecanismos de defensa NATURAL para combatir infecciones .**
- **Son sustancias tóxicas para las bacterias y hongos.**
- **Las plantas son capaces de defenderse por si mismas de hongos y bacterias mediante las fitoalexinas.**
- **Se producen naturalmente mediante** elicitores internos (Endoelicitores).
- **Se producen de 1 a 8 horas después de que las plantas son atacadas por hongos y bacterias.**

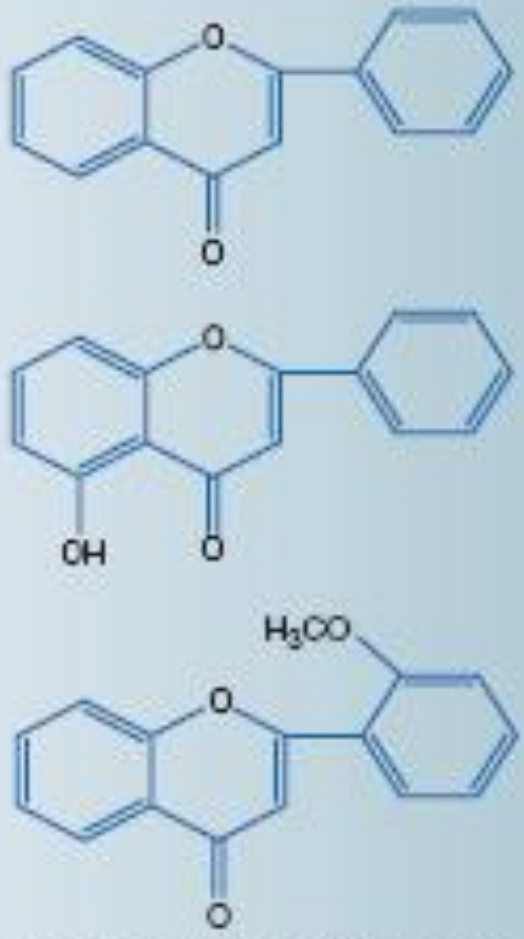


2. Las fitoalexinas son de naturaleza quimica muy heterogénea.

Las fitoalexinas son…..

- Terpenes (lípidos) de 5 carbones conocidos como unidades de isoprene o isoprenoides producidos por solanáceas.
- Fenoles aromáticos – flavonoides de 15 carbones. Los isoblavonoides son la mayoría de las fitoalexinas y son muy comunes en las leguminosa.



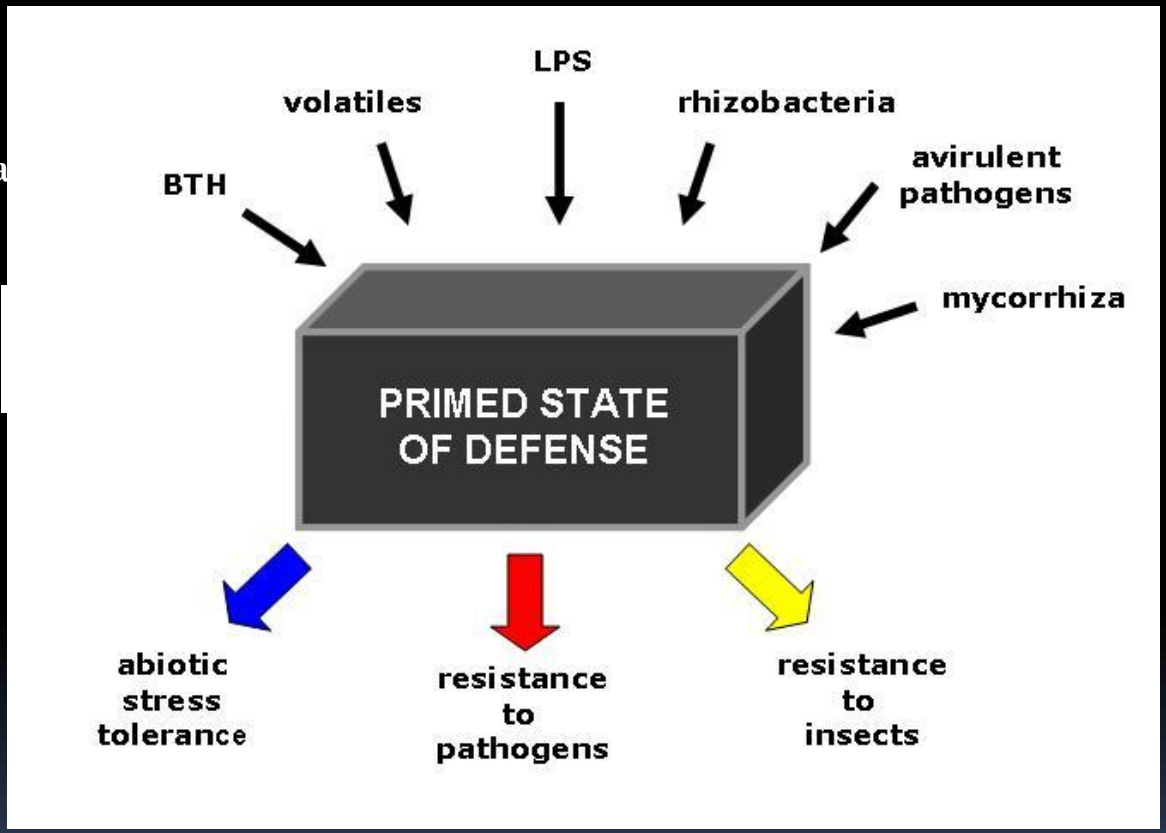


Flavonas secretadas por los tricomas de *Primula sulicula*

Exudados foliares recubren la superficie de las hojas como, una estrategia defensiva al ataque de patógenos.

Priming for enhanced defense

Vacuna
Agrobiola



Conrath, Pieterse, Mauch-Mani (2002): Trends Plant Sci.
Conrath *et al.* (2006) Mol. Plant-Microbe Interact. 19: 1062-1071

Exoelicitores son……

- Son elicitores externos naturales o

  sintéticos que
- Ayudan a la creación de fitoalexinas mediante la
- Creación de elicitores internos.


0.16
EC-meter


pH
pH - meter
pH4
pH7
°C
TEMP
°C
NIEUWKOOP HOLLAND


0 10 25 50 100 250
mg/l NO3
Kurzgebrauchsanleitung:


T1
R3
NN
T2
R3
NN

ANALISIS DE EXTRACTO CELULAR DE PELLAS DE BROCOLI , FERTILIZACIÓN DE NITRÓGENO EDÁFICA Y FERTIRRIEGO, 2009

	NO3	P-PO4	K	Ca	Mg	S	Zn	Cu	Fe	Mn	B	C.E.	pH
	mg/kg												
250kgN/ha Fert.Riego	780	7750	2964	142.3	224	439.7	0.48	0.05	0.32	0.12	0.02	5.64	6.9
Edaf 250 kgN/ha L.Lib	805	8075	2808	94.6	130	477.3	0.44	0.06	0.26	0.09	0.01	3.8	6.1
Edaf. 500kgN/ha Norm	**2300**	2900	1350	78.2	212	298	0.53	0.04	0.21	0.11	0.03	7.34	6.4
500 kgN/ha Fert Riego	210	250	1350	97.4	214	1826	0.54	0.03	0.49	0.1	0.02	6.67	6.6

PELLAS CON DOSIS DE NITRÓGENO DE 250 KG/HA

PELLAS CON DOSIS DE NITRÓGENO DE 500 KG/HA

AGROMAR

agromar@elcomercio

La sequía afectó a 8 425 hectáreas

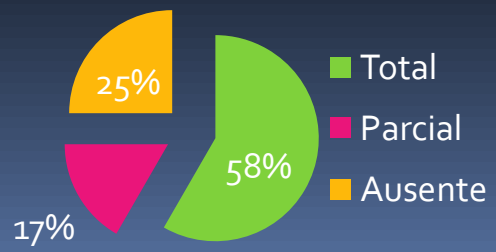
Los cultivos de Carchi, Pichincha, Cotopaxi, Bolívar, Tungurahua, Chimborazo y Cañar están dañados por la falta de agua

Redacción Agromar

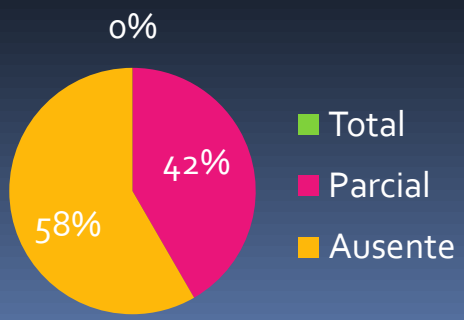
Según el Ministerio de Agricultura, Ganadería, Acuacultura y Pesca (Magap), la época seca provocó la pérdida de 225 hectáreas de cultivos y 8 425 hectáreas están afectadas en la Sierra.

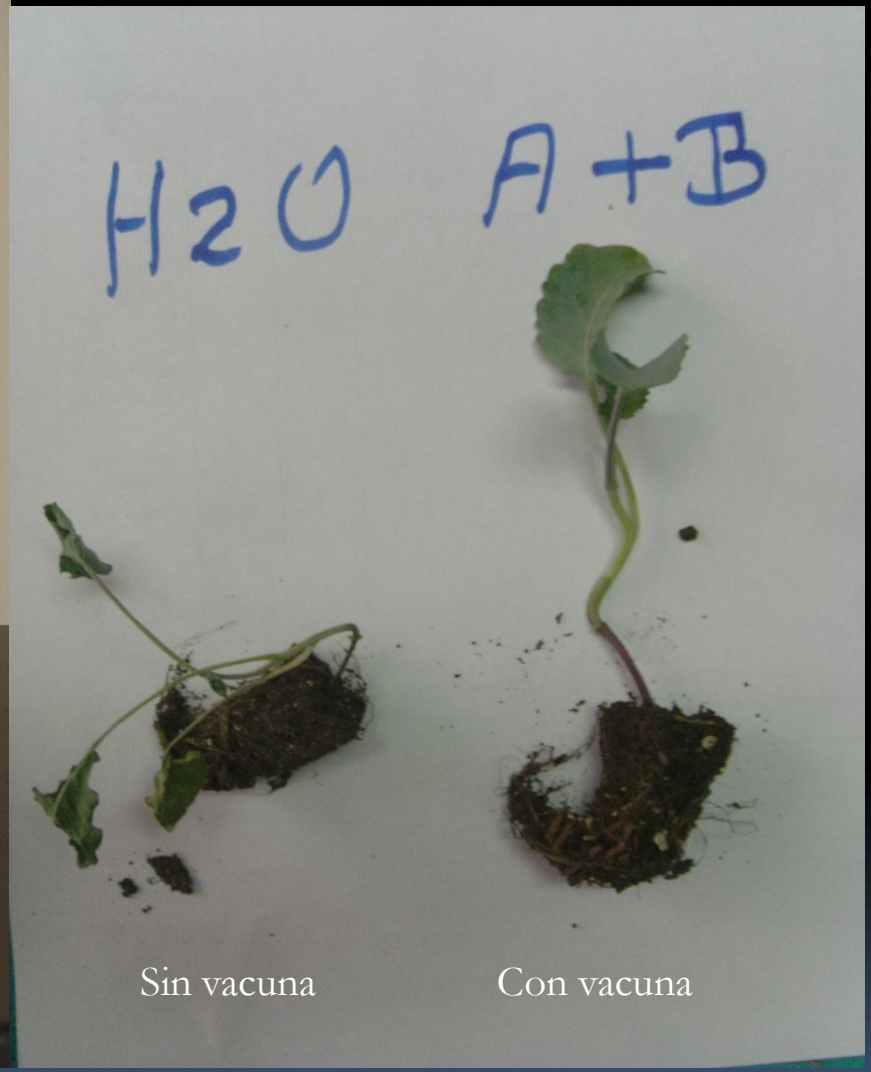
También se han presentado heladas, las cuales han afectado a 4 536 hectáreas y se han perdido 124 hectáreas, en las provincias de Carchi, Cotopaxi y Cañar, según el informe.

Grado de marchitez Control



Grado de marchitez VACUNA





Sin vacuna

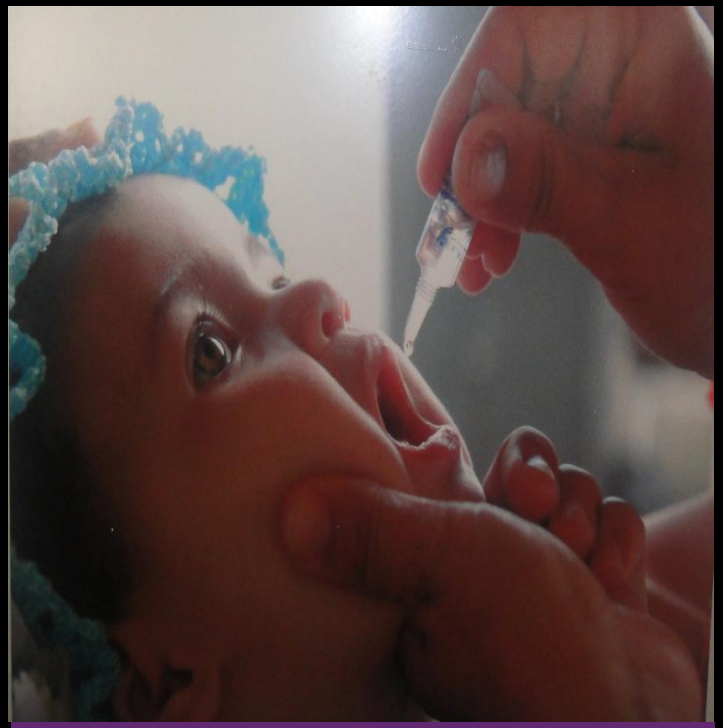
Con vacuna

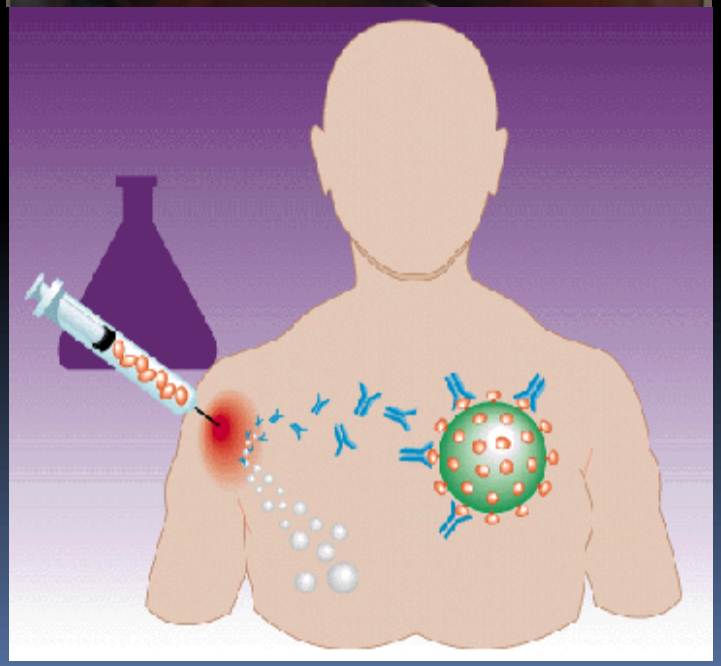

H2O
A+B

APLICACIÓN FOLIAR DE FERTILIZANTE

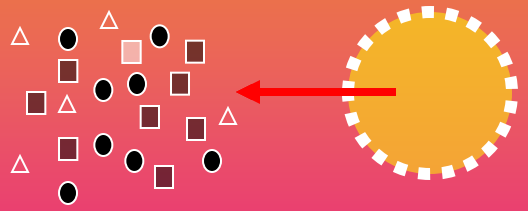

TENSIMETER
www.tensiometro.com.br
ZERO
ON

APLICACIÓN DE VACUNA





Inactive defenses

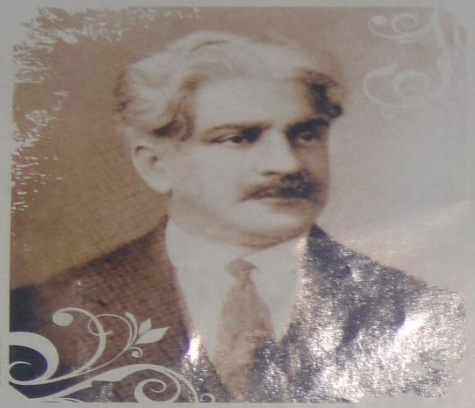


ILUSTRES BRASILEIROS

OSWALDO CRUZ

Líder de um povo vacinado

Por Natália Pesciotta



Ele enfrentou quebra-quebras e ameaças de golpe por defender um conceito diferente de saúde. Foi o "vilão" de uma das mais marcantes revoltas populares do Brasil. Patrono do nosso templo da ciência, descartou técnicas ultrapassadas para combater doenças. Foi pioneiro ao observar a saúde além dos pequenos limites da capital federal. Perdeu batalhas. Mas ganhou a guerra.

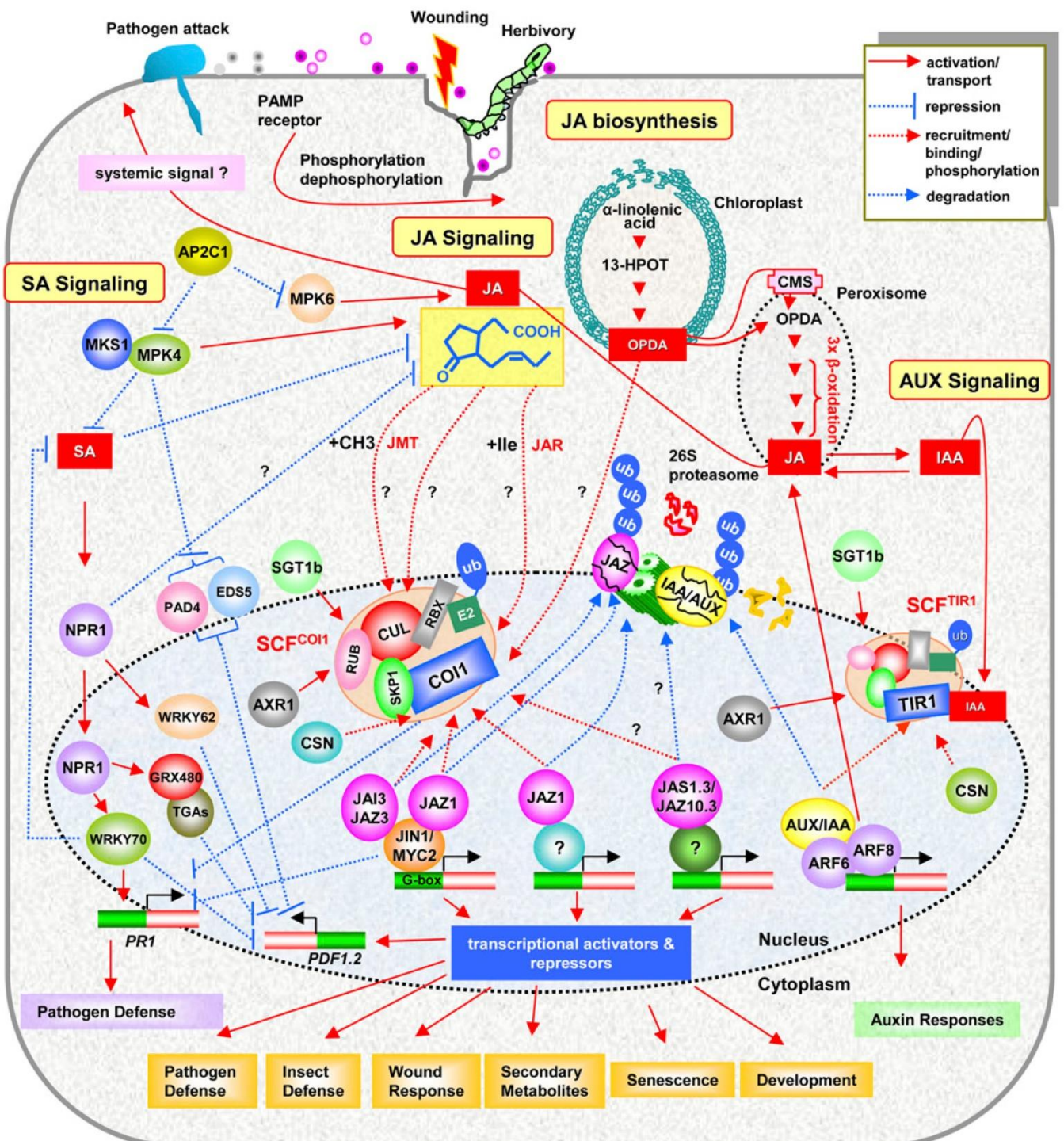
No começo do século 20, acreditava-se que o ar proveniente de lugares sujos ou com água parada era a causa de epidemias. Por isso, destruir cortiços e moradias populares parecia a solução ideal para o Rio de Janeiro – "túmulo de estrangeiros", uma cidade doente, com alta mortalidade por febre amarela. Assim que assumiu a Diretoria Geral da Saúde Pública, Oswaldo Cruz rejeitou as práticas vigentes e apostou na teoria de um especialista cubano: os mosquitos são os verdadeiros transmissores e devem ser exterminados. Além disso, passou a escrever a coluna Conselhos ao Povo nos jornais e a distribuir folhetos educativos sobre a doença.

Depois foi à caça de ratos para combater a peste bubônica. Chegou a instituir funcionários públicos para comprar os pequenos roedores capturados pela cidade – e é claro que alguns espertinhos logo trataram de criar seus próprios ratos para vender ao governo. Era chamado de "czar dos mosquitos", entre outras ironias, e contava com poucos recursos. Tornar obrigatória a vaci-

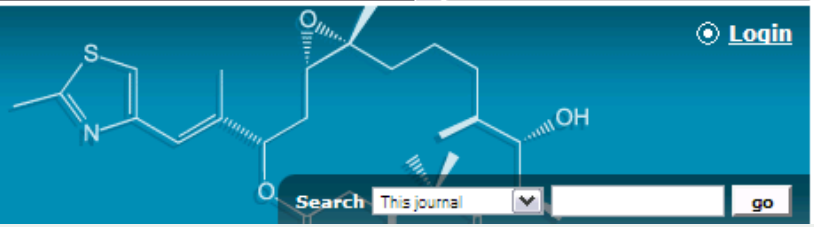
[illegible] direito à liberdade, [illegible] "receber um líquido desconhecido nas veias". A população saiu às ruas, virou bondes, quebrou lampiões e fez a revolta da Vacina, uma das mais marcantes revoltas populares do Brasil, ocorrida em 1904.

O médico sanitarista [illegible] se sentiu [illegible] ado. Ele que, apesar de terríveis náuseas, tinha [illegible] de navio a diversos do País estudar as doenças que circulavam pelo [illegible] rios. Mas as insatisfações refletiam a [illegible] de saúde. O presidente Rodrigues Alves promovia [illegible] de "bota-abaixo". Para fazer da capital uma metrópole moderna, brigadas do governo destruíam cortiços e bairros pobres sem preocupação alguma com o futuro dos despejados, que iam ajeitando-se pelos morros.

A oposição política e a Escola Militar, interessadas num golpe, engrossaram a massa desconexa de revoltosos. O governo controlou a rebelião, mas teve que revogar a lei da imunização. Apesar dis-


Pathogen attack
Wounding
Herbivory
PAMP receptor
Phosphorylation dephosphorylation
systemic signal ?
JA biosynthesis
JA Signaling
SA Signaling
AUX Signaling
activation/ transport
repression
recruitment/ binding/ phosphorylation
degradation
Chloroplast
α-linolenic acid
13-HPOT
OPDA
CMS
Peroxisome
3x β-oxidation
AP2C1
MPK6
MKS1
MPK4
JA
COOH
SA
+CH3
JMT
+Ile
JAR
26S proteasome
IAA
SGT1b
PAD4
EDS5
NPR1
SCFCOI1
CUL
RBX
E2
RUB
SKP1
COI1
JAZ
IAA/AUX
SCFTIR1
TIR1
AXR1
CSN
WRKY62
GRX480
TGAs
WRKY70
JAI3 JAZ3
JAZ1
JIN1/ MYC2
G-box
JAS1.3/ JAZ10.3
AUX/IAA
ARF6
ARF8
PR1
PDF1.2
transcriptional activators & repressors
Nucleus
Cytoplasm
Pathogen Defense
Auxin Responses
Pathogen Defense
Insect Defense
Wound Response
Secondary Metabolites
Senescence
Development

nature chemical biology



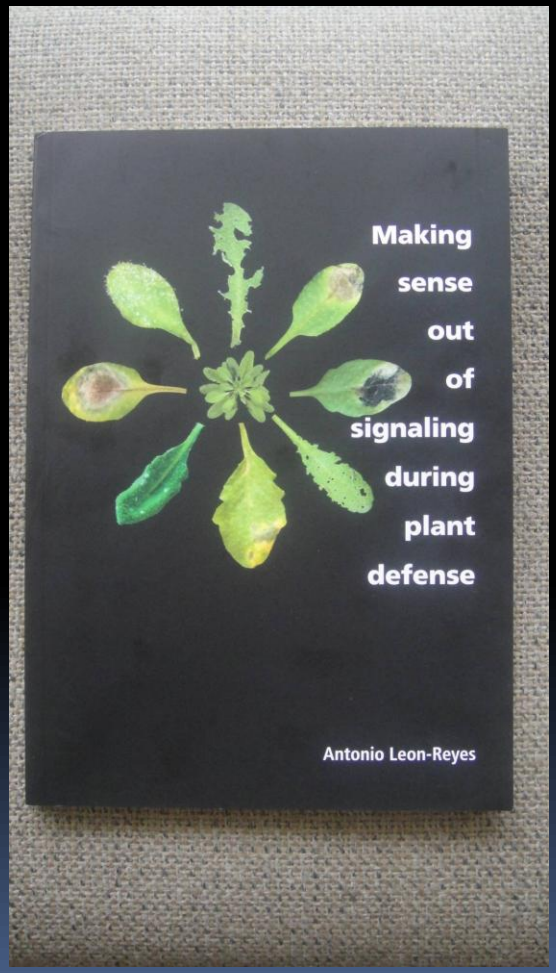
REVIEW

nature chemical biology

Networking by small-molecule hormones in plant immunity

Corné M J Pieterse, Antonio Leon-Reyes, Sjoerd Van der Ent & Saskia C M Van Wees

Plants live in complex environments in which they intimately interact with a broad range of microbial pathogens with different lifestyles and infection strategies. The evolutionary arms race between plants and their attackers provided plants with a highly sophisticated defense system that, like the animal innate immune system, recognizes pathogen molecules and responds by activating specific defenses that are directed against the invader. Recent advances in plant immunity research have provided exciting new insights into the underlying defense signaling network. Diverse small-molecule hormones play pivotal roles in the regulation of this network. Their signaling pathways cross-communicate in an antagonistic or synergistic manner, providing the plant with a powerful capacity to finely regulate its immune response. Pathogens, on the other hand, can manipulate the plant's defense signaling network for their own benefit by affecting phytohormone homeostasis to antagonize the host immune response.


Making
sense
out
of
signaling
during
plant
defense
Antonio Leon-Reyes

Con el uso adecuado de la Ciencia y tecnología

DECRECIMIENTO DE LA MISERIA RURAL EN LATINO AMERICA

CON LA AYUDA DE LA TECNIFICACION AGRICOLA

LA TRANSICIÓN DE POBREZA PARA RIQUEZA ES EL GRAN IMPACTO, PRINCIPALMENTE EN EL MEDIO RURAL EN MUCHOS PAISES LATINO AMERICANOS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