

El costo humano del uso de cultivos GM en Sud América

Human cost of GM crops in South America

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MEDICXS DE PUEBLOS FUMIGADOS



University Network for Environment and Health -
Physicians of Crop-Sprayed Towns

10 años de la UCCS

Conferencia Científica 2016

Balance:
20 Años de Cultivos Transgénicos & 40 Años de 'Ingeniería Genética'

Como evento preparativo de la Conferencia de las Partes del Protocolo de Cartagena en Bioseguridad

Destacados científicos de todo el mundo

Entrada libre
Registro y Programa en:
www.uccs.mx

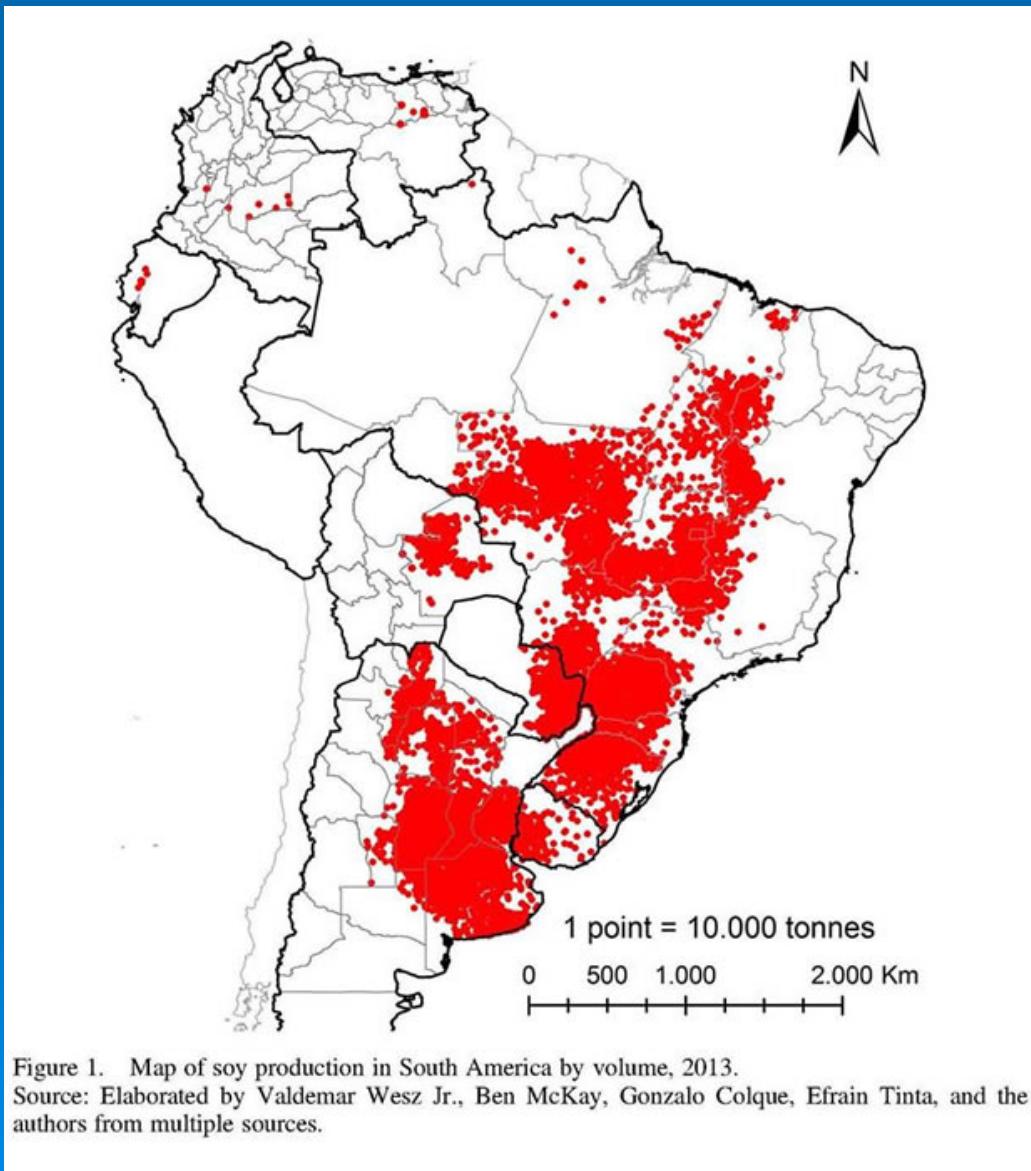
Auditorio Yelizcalli
Facultad de Ciencias, UNAM
1 y 2 de diciembre, 2016
9 AM a 6 PM

UCCSNAL - UNIÓN DE CIENTÍFICOS COMPROMETIDOS CON LA SOCIEDAD Y LA NATURALEZA DE AMÉRICA LATINA

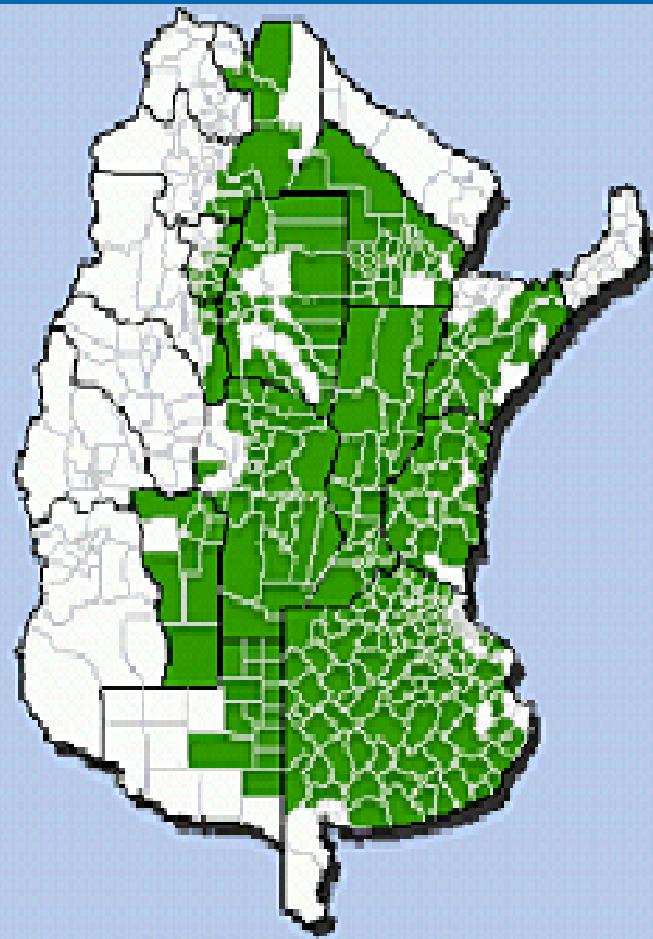
TWN
Third World Network

Diseño gráfico: Martín Pach

Human cost of GM crops in South America



Soja 2013
Brasil 45 millones de h
Argentina 25 millones de h
Paraguay 3 millones de h
Uruguay 1,3 millones de h
Bolivia 0,8 millones de h

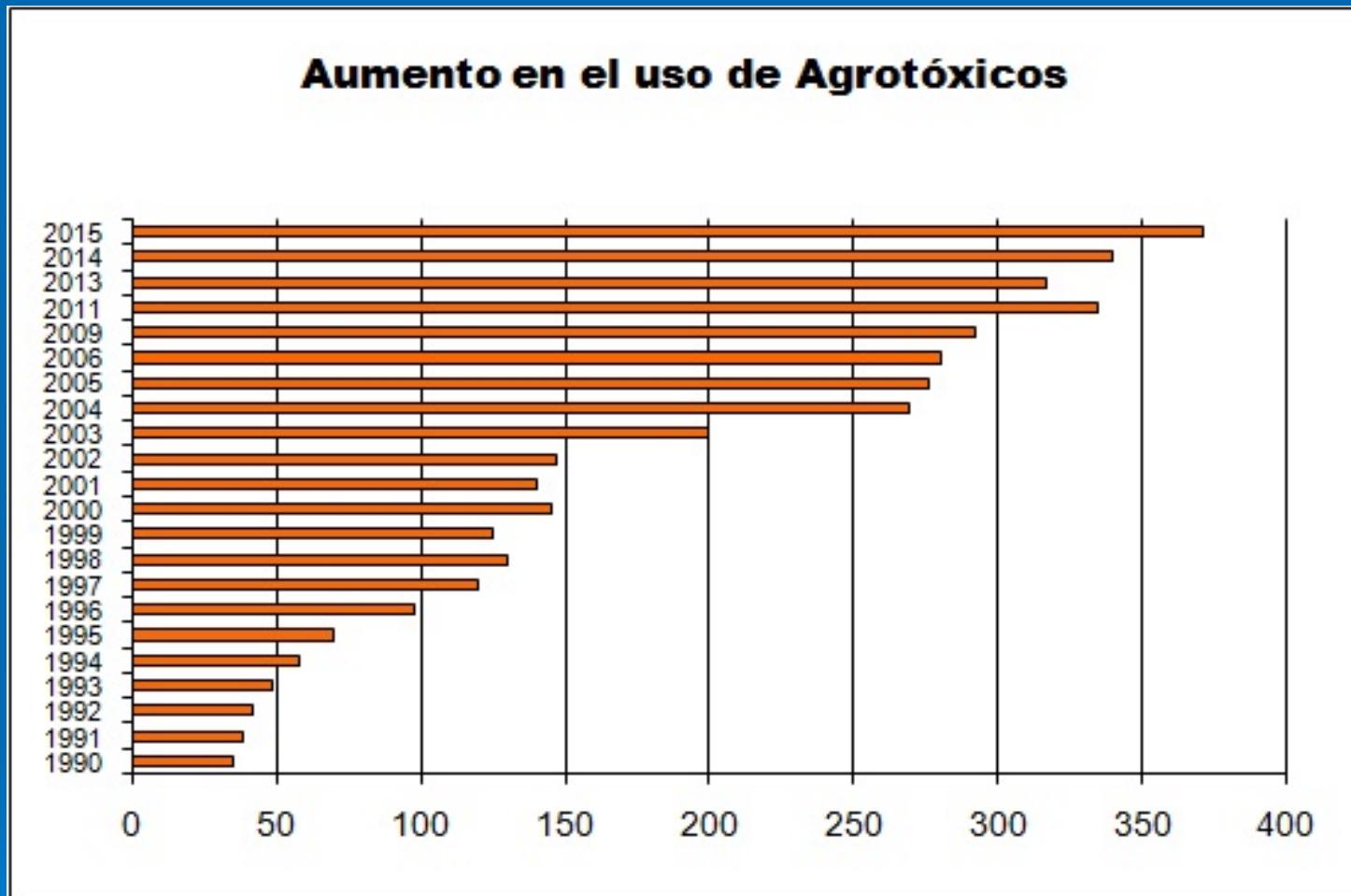


ARGENTINA

12 millones de personas viven entre 25 millones de ha cultivadas con soja GM

12 million people and 25 million hectares cultivated with GM soybeans

The use of toxic agrochemicals in Argentina is continuously increasing



From 1990 to 2013, from 38 million to 370 million kilos in 22 years; it increased 958%,

Source CASAFE



Facultad de Ciencias Medicas
Universidad Nacional de Córdoba

**1st NATIONAL MEETING OF
PHYSICIANS IN THE CROP-SPRAYED
TOWNS
Córdoba, Agosto 2010**



Facultad de Ciencias Médicas
UNIVERSIDAD NACIONAL DE ROSARIO

Declaración del 2º ENCUENTRO DE MEDICOS DE PUEBLOS FUMIGADOS

**2º ENCUENTRO NACIONAL DE
MÉDICOS DE PUEBLOS FUMIGADOS
Rosario, Abril 2011**



UBA:
Universidad
de Buenos Aires



**3º CONGRESO NACIONAL DE
MEDICOS DE PUEBLOS FUMIGADOS
Buenos Aires, Octubre 2015**

Do pesticides affect the health of the population?

**According to clinical observations and findings from doctors:
THEY DO**

Acute or immediate effects

**Respiratory, dermal, and ophthalmologic effects
Neurological, hepatic, immunological effects**

Medium- and long-term effects

**autism spectrum disorder
abortions, birth defects,
cancers, etc.**

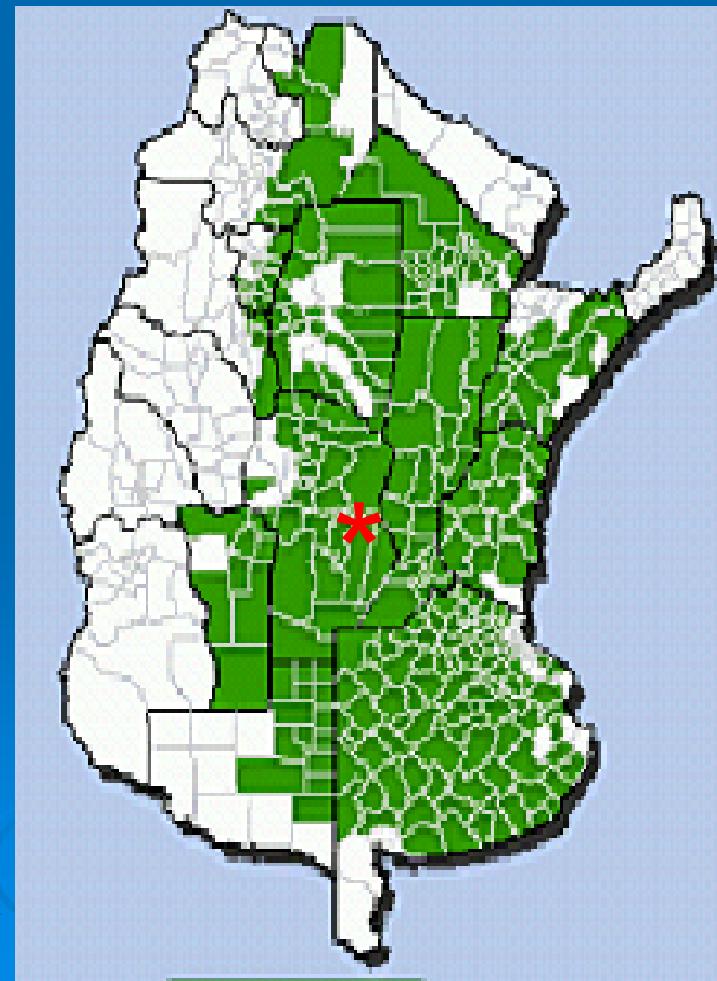
Evaluation of the SOCIO-ENVIRONMENTAL COLLECTIVE HEALTH of Monte Maíz

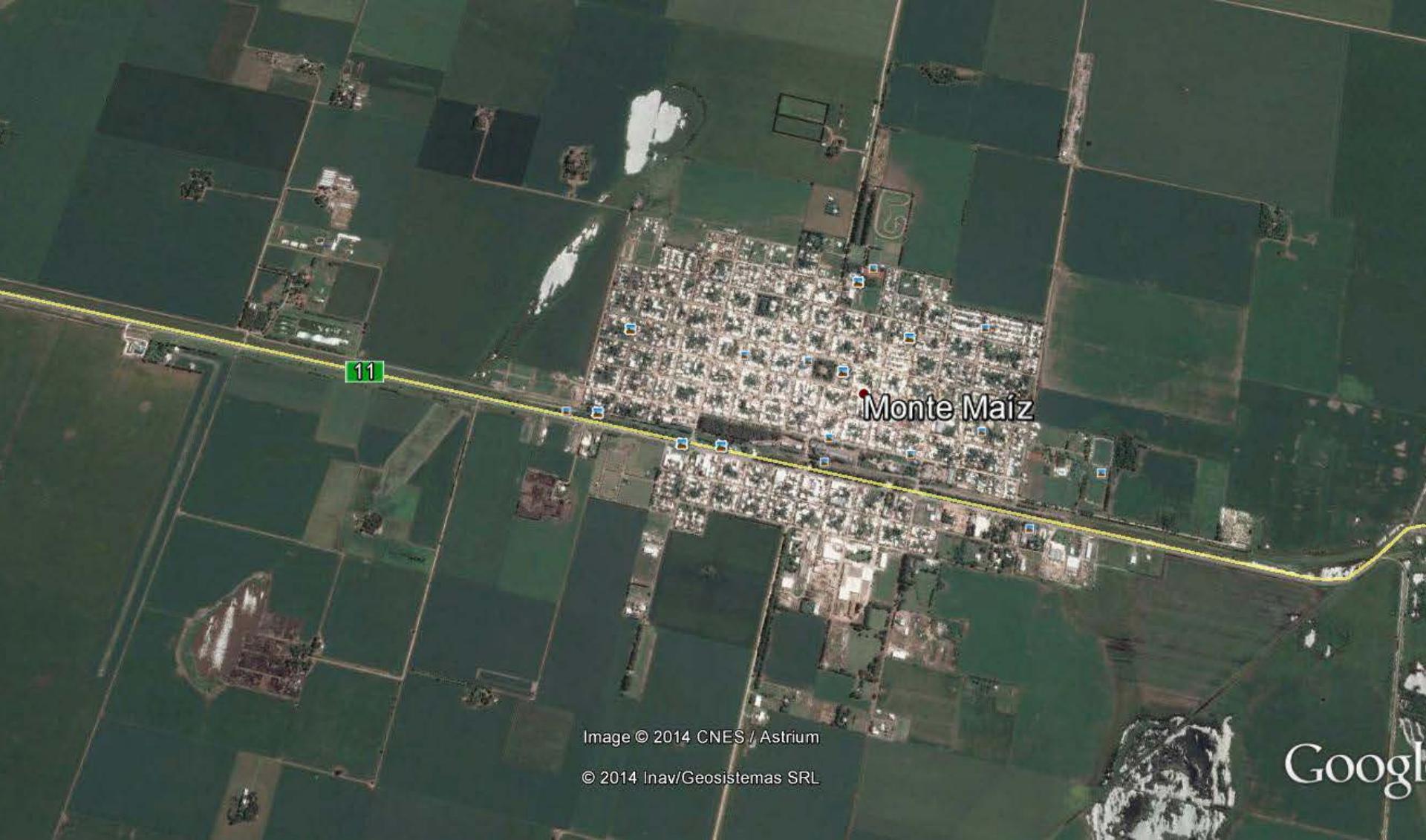
Town: MONTE MAÍZ

Population 8000 people
industrial town and cultivation of genetically modified soybeans

Community census 2007:

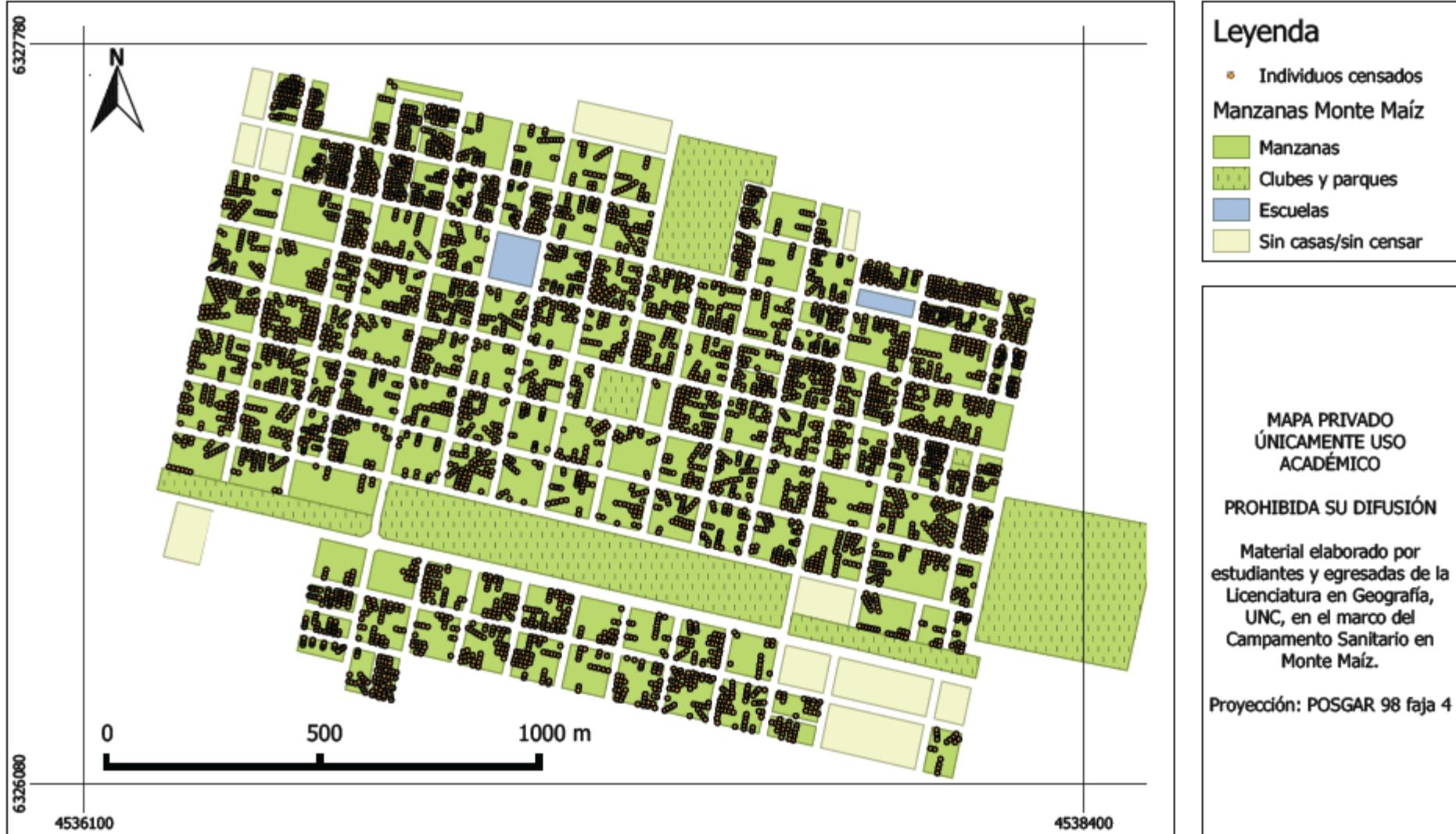
High cancer, lupus and rheumatoid arthritis





**Study 2014,
National University of Córdoba and Municipality of Monte Maiz**

CENSO SANITARIO MONTE MAÍZ, CÓRDOBA

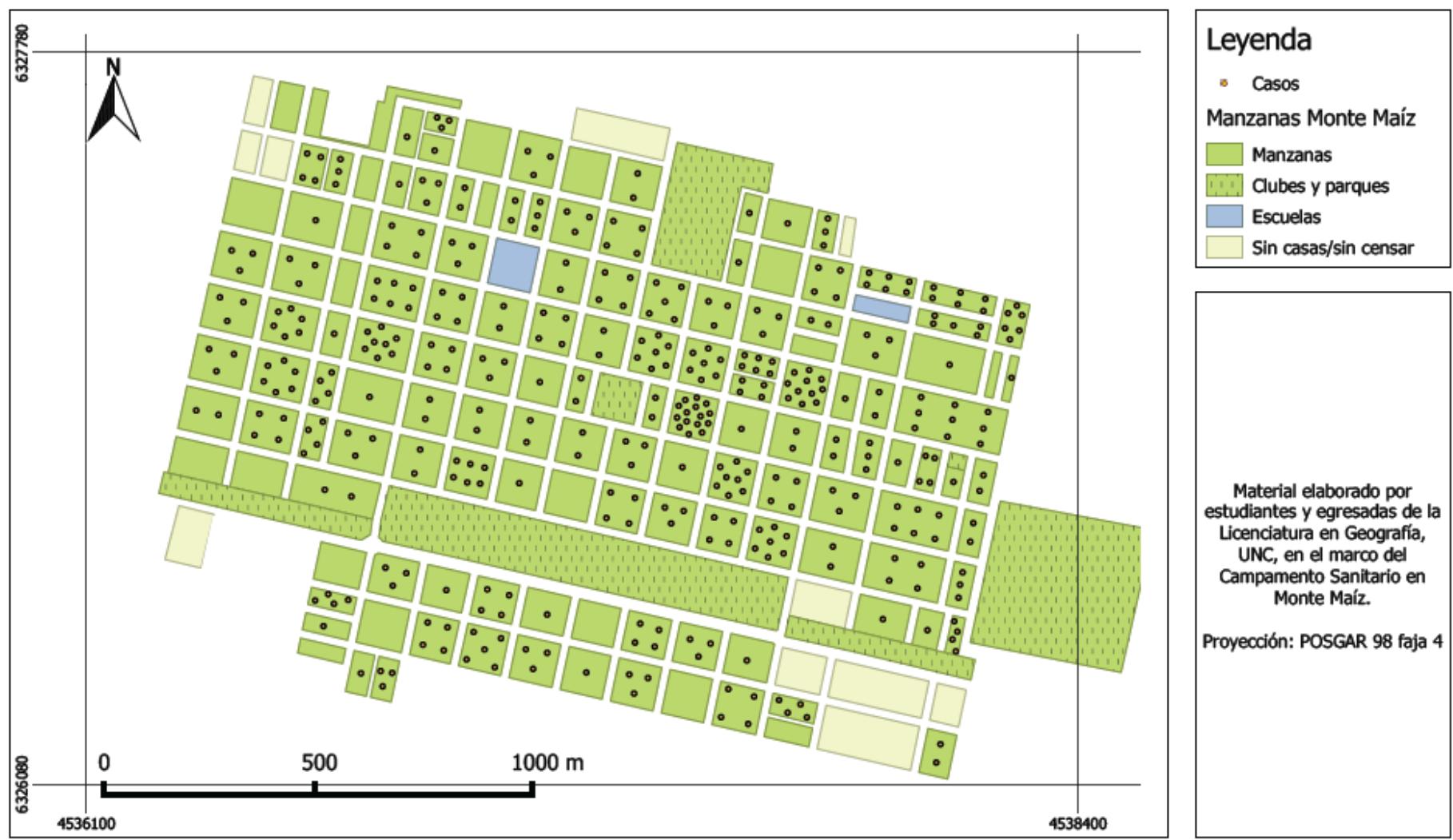


CASOS DE NEUMOPATÍAS Y DIVISIÓN CENSAL MONTE MAÍZ, CÓRDOBA

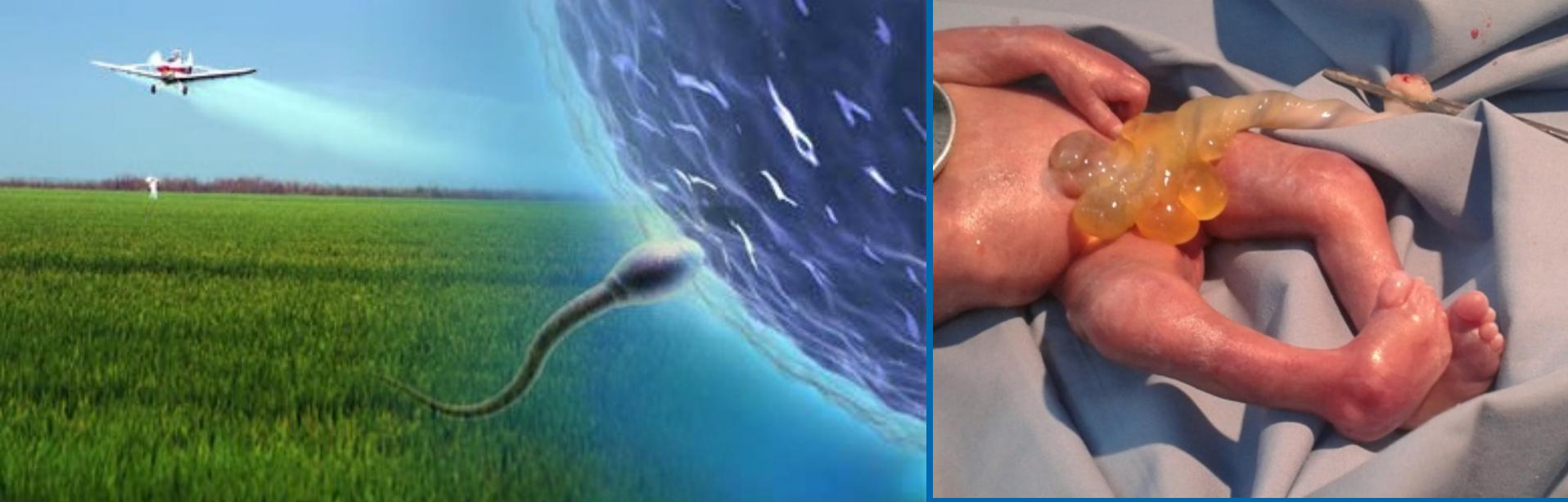


Asthma 13-14 años	39,86%	13,8% (ciudad de Cba.) Global Asthma Report 2014
Asthma 6-7 años	52,43%	14% (mundial)

CASOS DE HIPOTIROIDISMO MONTE MAÍZ, CÓRDOBA



Hypothyroidism ≥ 20 años: 11% (20 -40 years old: 23%)
Colorado Thyroid Disease Prevalence Study - CDC USA = 6%



Birth defects Monte Maíz
(Only those who are alive) 3%

Birth defects Córdoba city 1,7%

Birth defects



CONGENITAL ANOMALIES

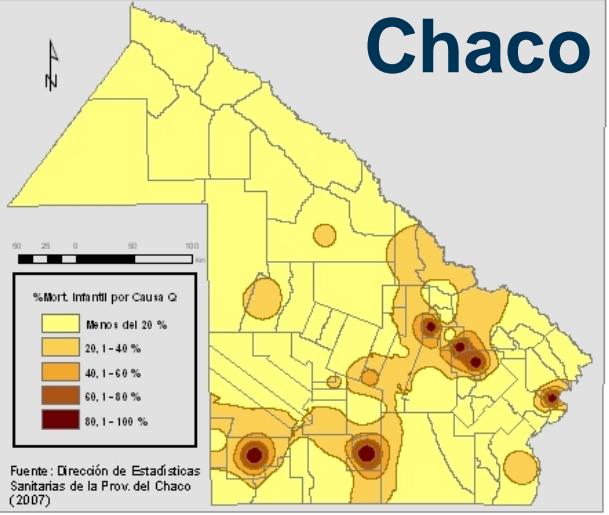
Increased prenatal diagnosis in sprayed areas in Tucuman

High rate of neural tube defects at the Posadas, Misiones Hospital

Dr. Páramo: 12 birth defects out of 200 births in Malabriga, Sta Fé



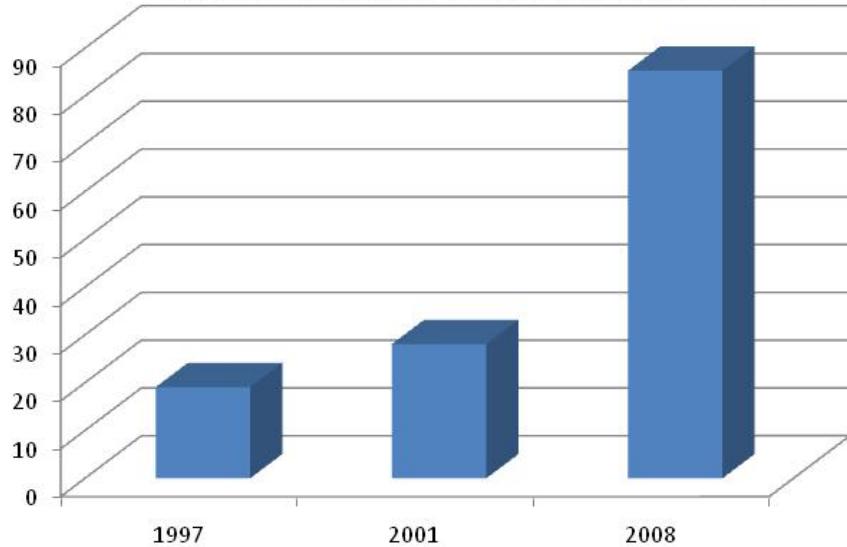
Chaco



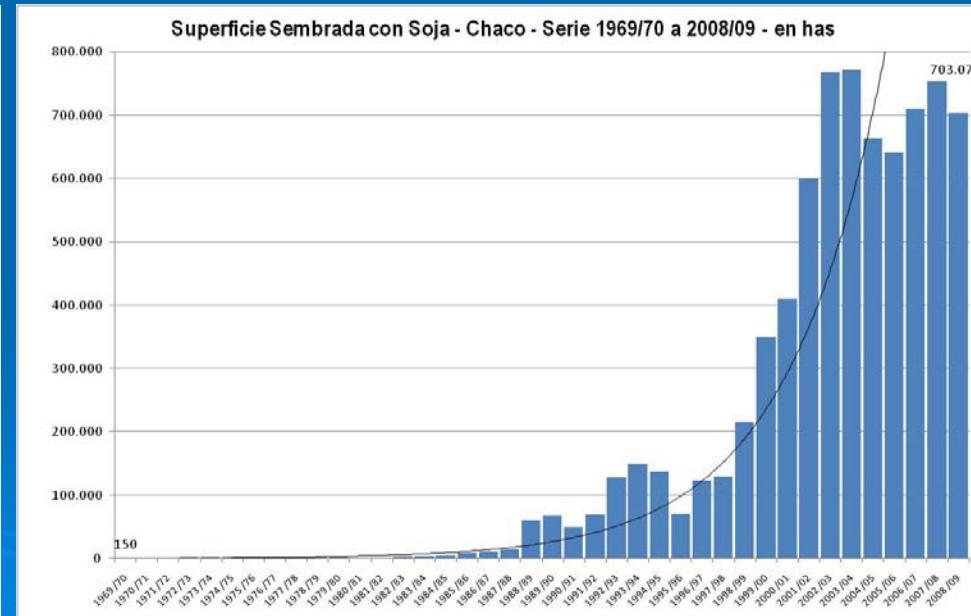
Birth defects

Year	Cases registered by year in hospital Resistencia City
1997	46 defects
2001	60 defects
2008	186 defects

Malformaciones por cada 10.000 nacidos vivos



Superficie Sembrada con Soja - Chaco - Serie 1969/70 a 2008/09 - en has



Evolution of congenital birth defects and soy-cultivated areas in Chaco

Congenital birth defects associated with agrochemicals. PARAGUAY

Prospective case-control study

March 2006 - February 2007. All newborns with congenital birth defects were considered "cases", whilst all healthy children of the same sex born immediately afterwards were considered "control".

Risk factors:

Living less than 1 km **OR:2,66 IC 95%: 1,19-5,97, p<0,008**

Storage of pesticides at home **OR: 15,35 IC 95%: 1.96-701,63**

Being directly or accidentally in contact with pesticides **OR 3.19 IC 95%: 0,97-11.4**



Leite Benitez

Dra. Leite Benitez. Pediatrics Chair,
National University of Asuncion, Paraguay

Pediatr. (Asunción), Vol. 34; Nº 2; 2007

Non-cancer health effects of pesticides: systematic review and implications for family doctors. Sanborn M,

50 studies from 9 countries with of good quality

Studies consistently showed an increased risk of reproductive damage with the exposure to pesticides.

The overall rate for any birth defect also increased with parents exposed to pesticides.

Two works identified specific pesticides, amongst them: glyphosate

Birth defects and Atrazine in surface waters. Winchester 2009

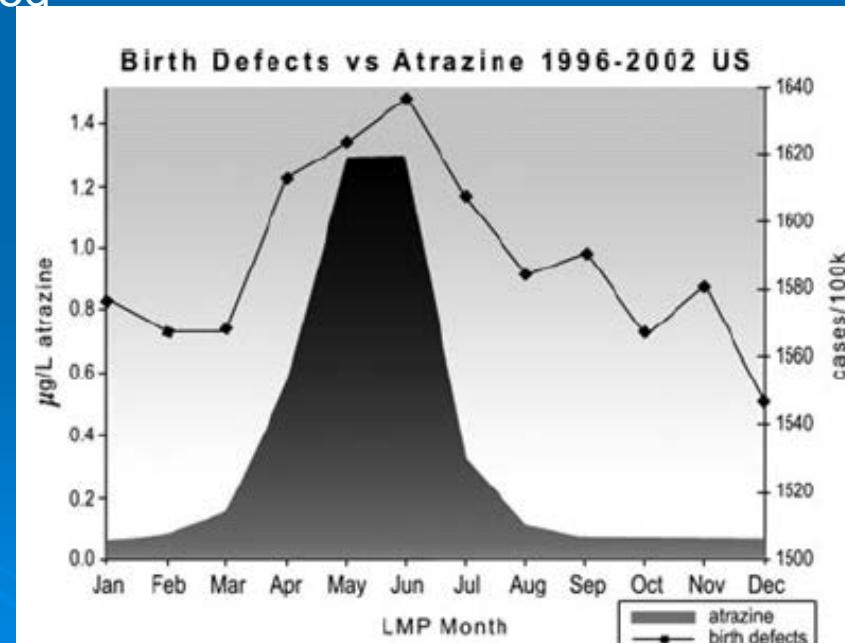


Figure 1 The United States birth defect rates by month of LMP versus atrazine concentrations.

MISCARRIAGES

9 out of 11 studies showed a positive link between exposure to pesticides and miscarriages, fetal death, stillbirth; and critical windows to the moment of exposure with early or late abortions.

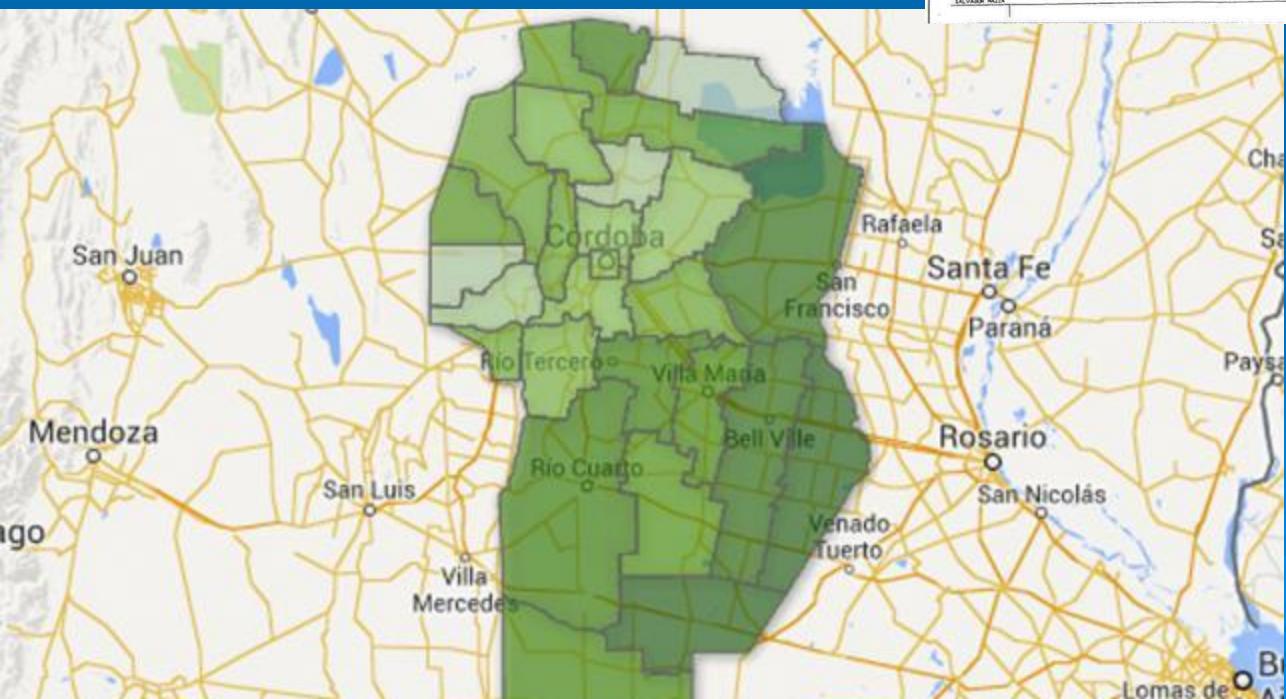
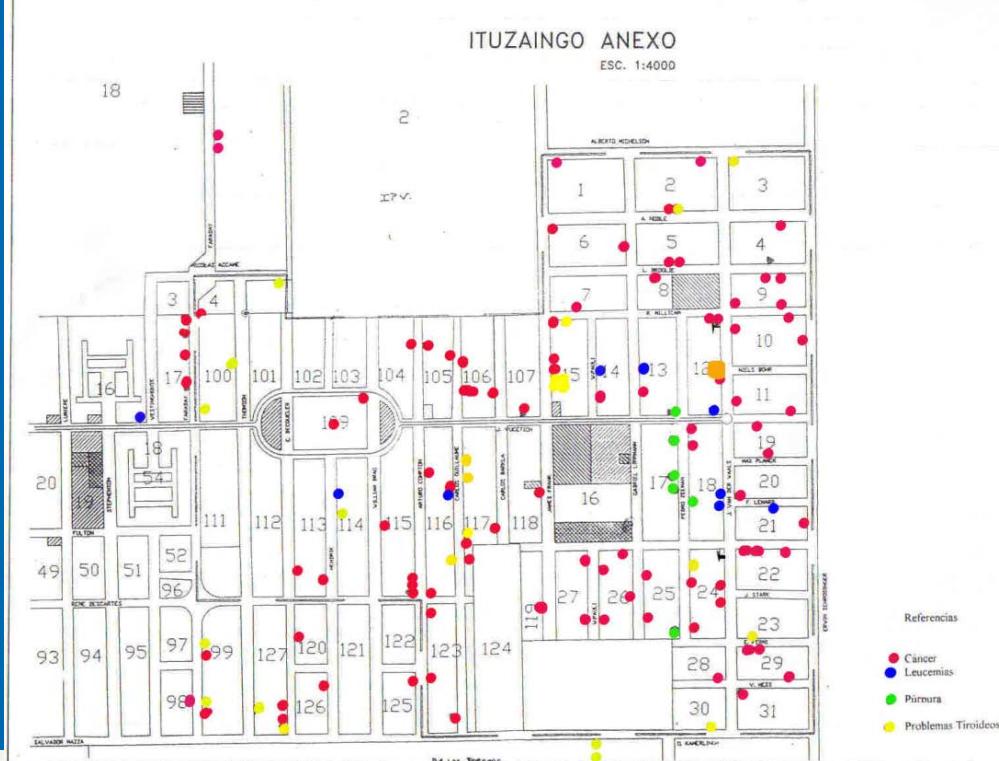
Site	abortions per 100 women in reproductive age
Argentina	3% in 5 years
Ituzaingo Neighborhood	21 % in 5 years
Las Vertientes	19% in 5 years
Malvinas Argentinas	23% in 5 years
San Antonio Neighborhood	2.5% in 5 years
Monte Maíz	10% in 5 years

Malformed Fetus



increase in pesticides

Increased cancer

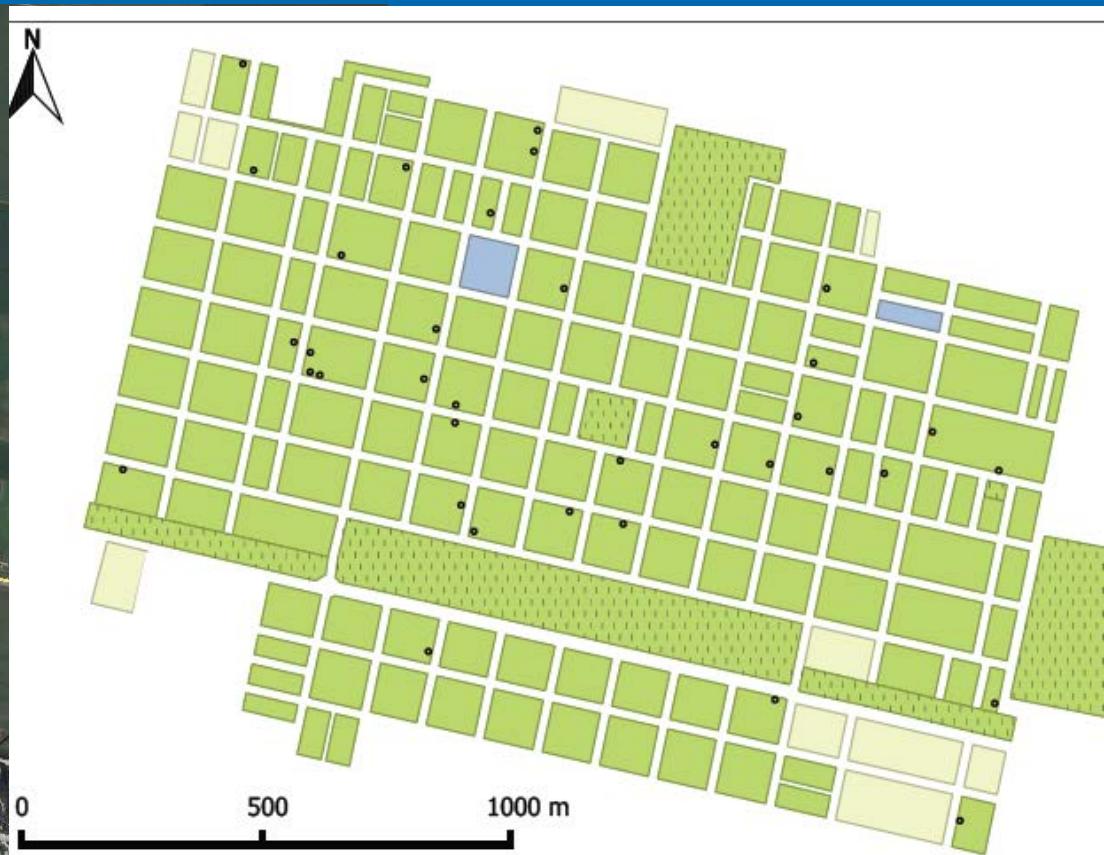


CÁNCER en MONTE MAÍZ

Incidence 2014:

35 cases, would have to be between 11 and 13 cases
(707/100.000 should have 259/100.000)

Prevalence 2009-2014 : 104 patients should have 44
(2.122/100.000 should have 883/100.000)



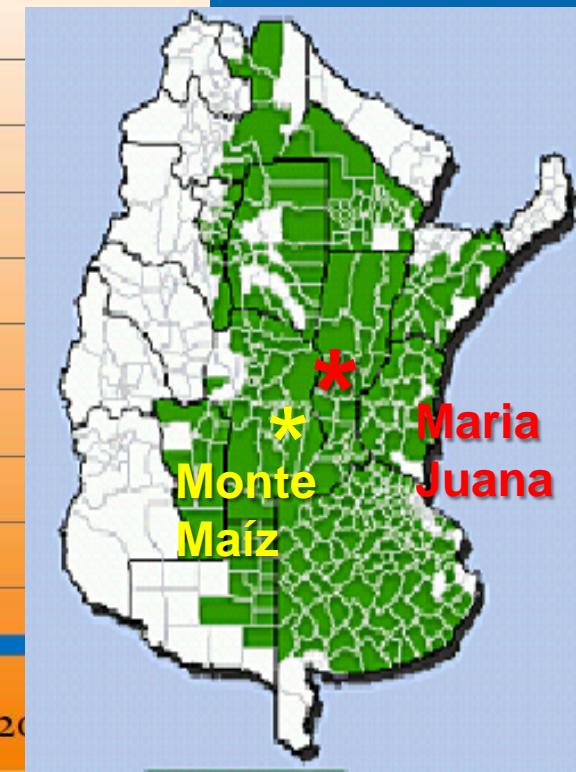
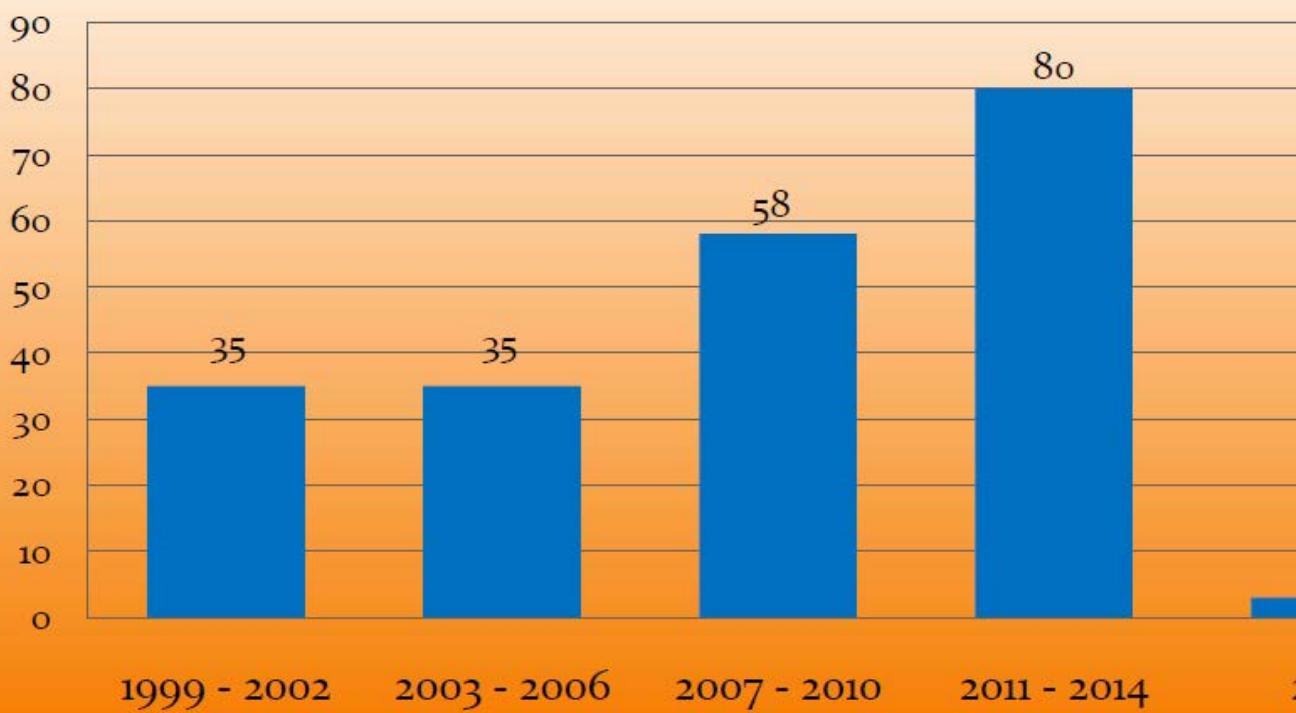
Prevalence Cáncer

Maria Juana: 2030/100.000, Monte Maíz: 2122/100.000

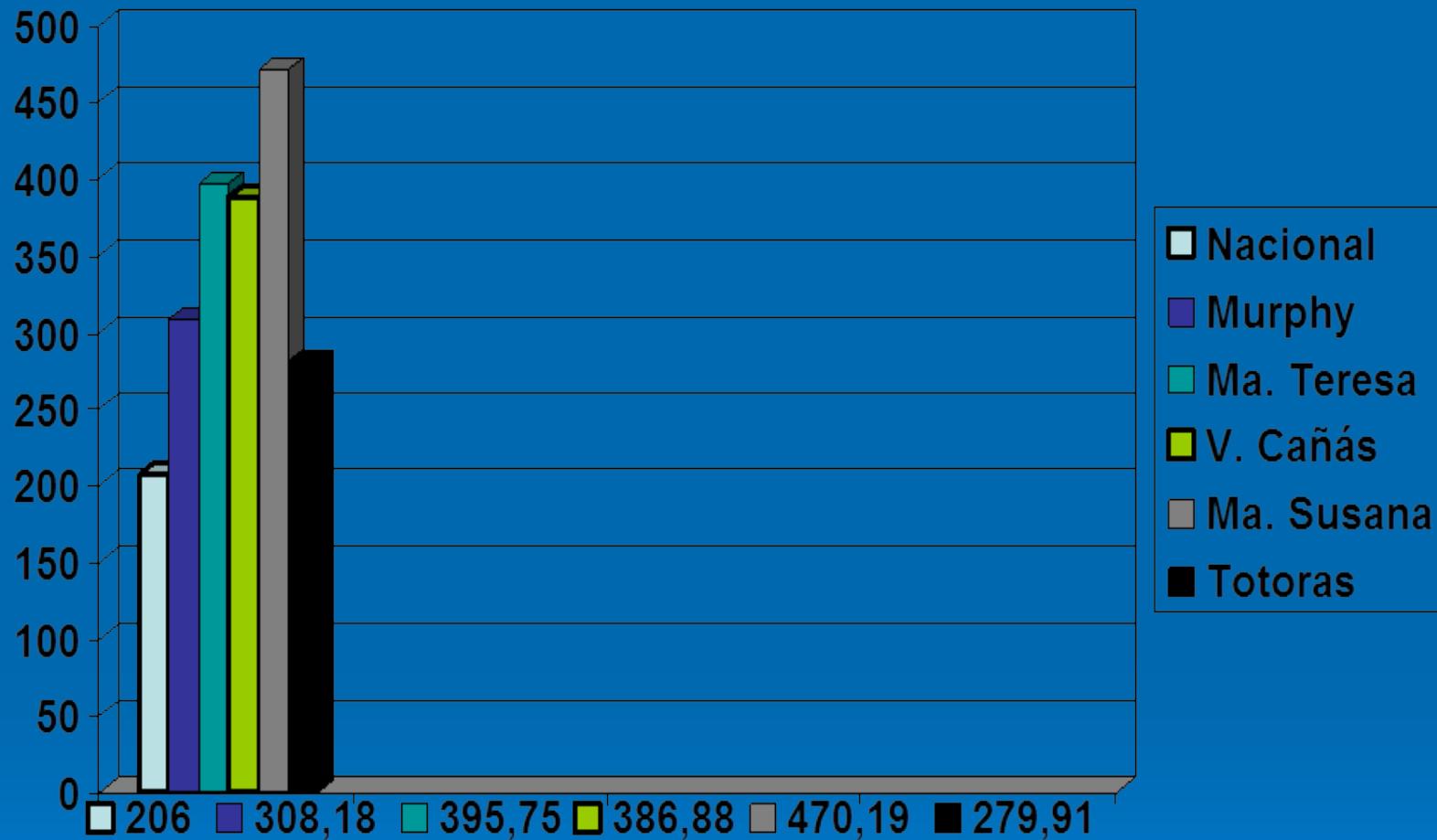
80 enfermos de CÁNCER que no deberían ser mas de 34...



Nº de Diagnósticos de Cáncer o Tumor (c/4 años)



Cáncer Incidence for 100.000 persons



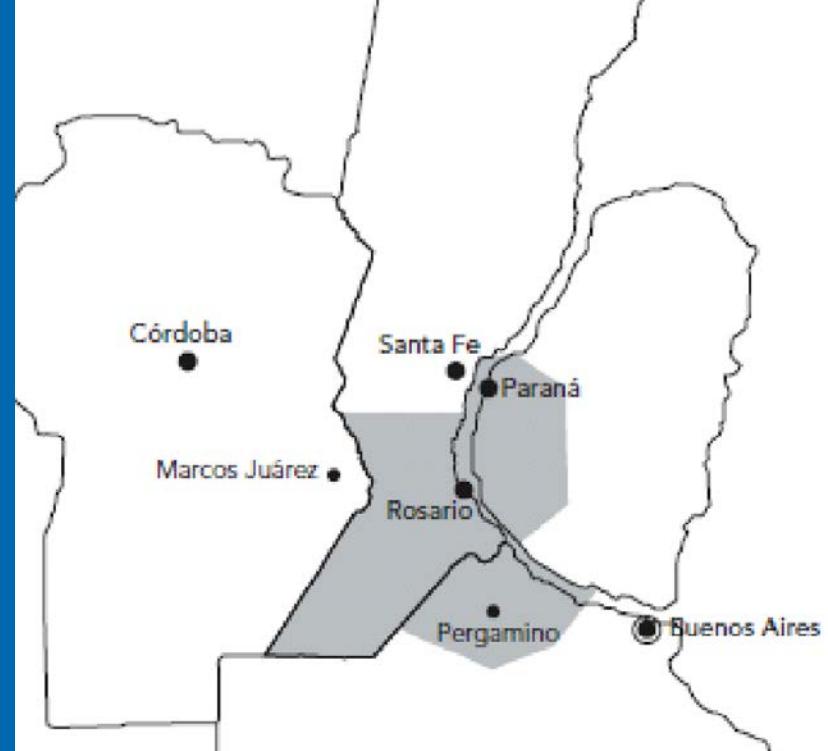
Rural and Reproductive Health Study

Dr. Alejandro Oliva 2008

Gastric cancer and testis x 3 times

Liver Cancer x 9 times

Lung Cancer and Pancreatic x 2 times



Hernando City, Secretary of Health-

2001 – 2003: 67 cancer patients

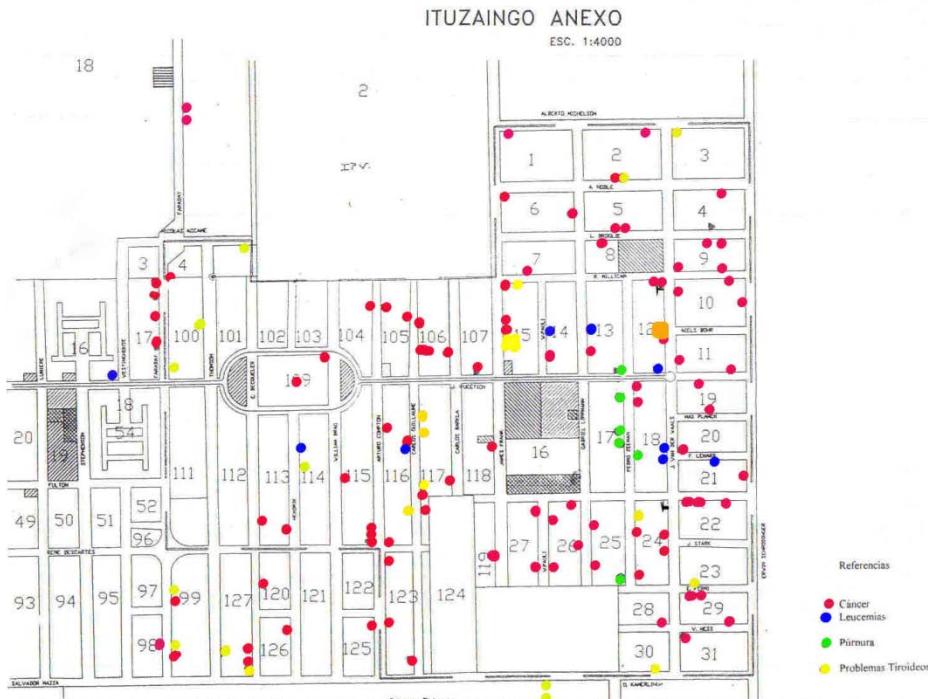
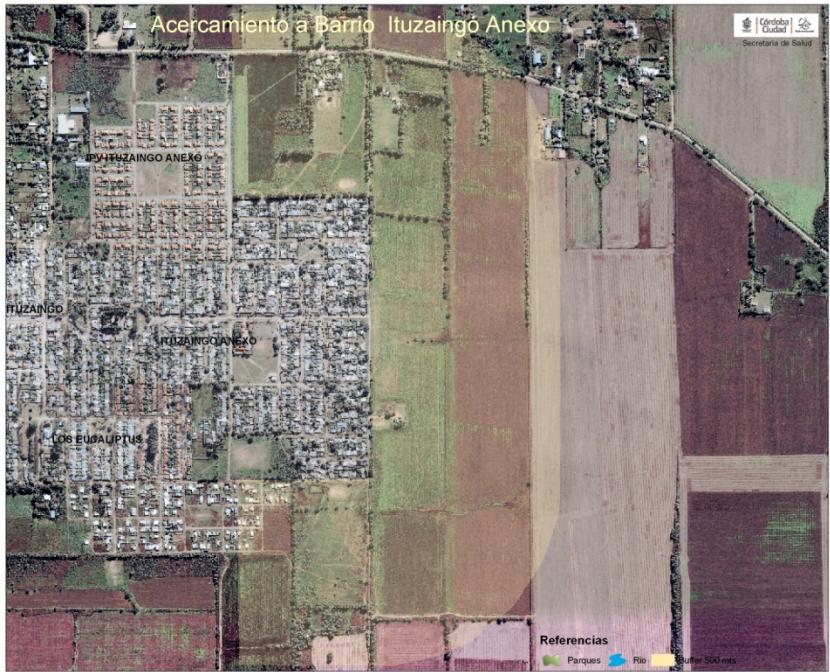
2010 – 2012: 173 cancer patients.

Increase of 258%

local prevalence rate in cancers 1440 cases / 100,000 people

overall prevalence rate in cancers 800 cases / 100,000 people (WHO)

Increased cancer increase in pesticides



Ituzaingo Neighborhood: 2000-2009 33% of deaths were due to Cancer

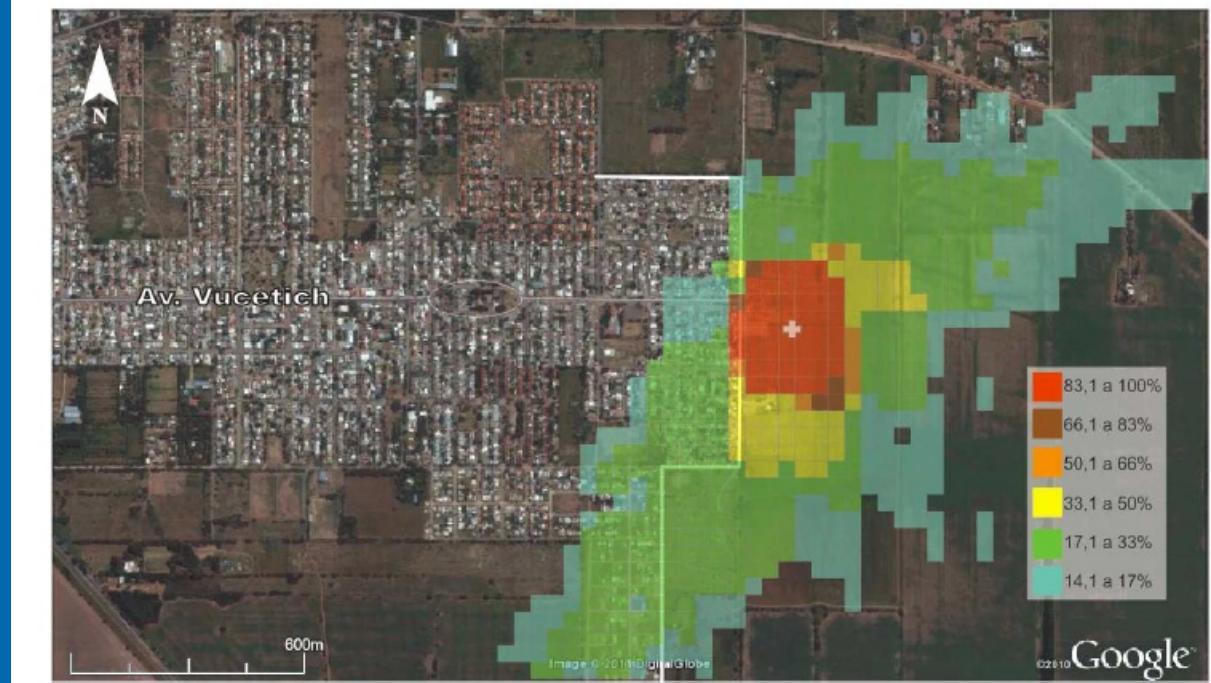
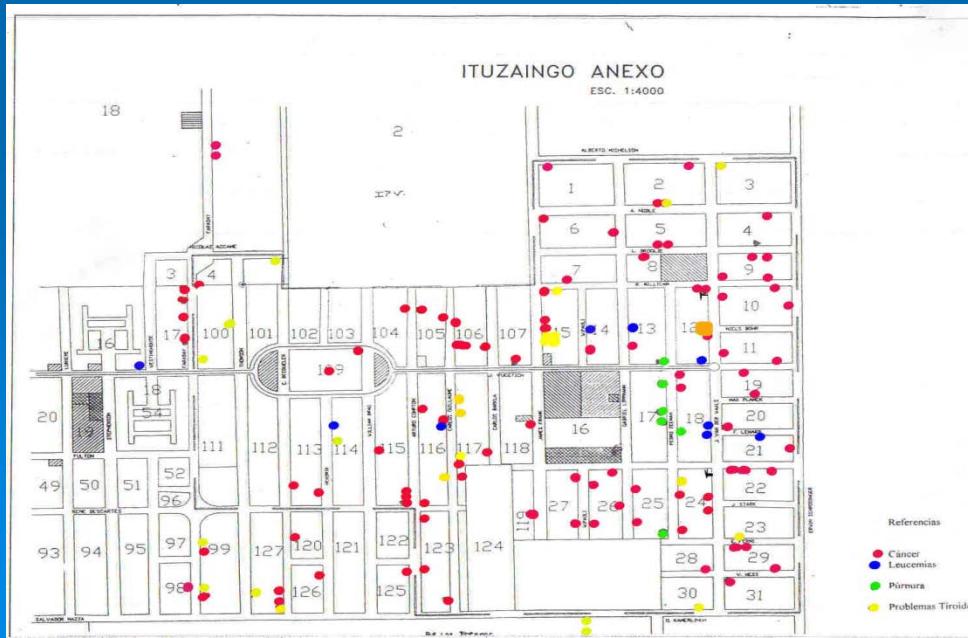
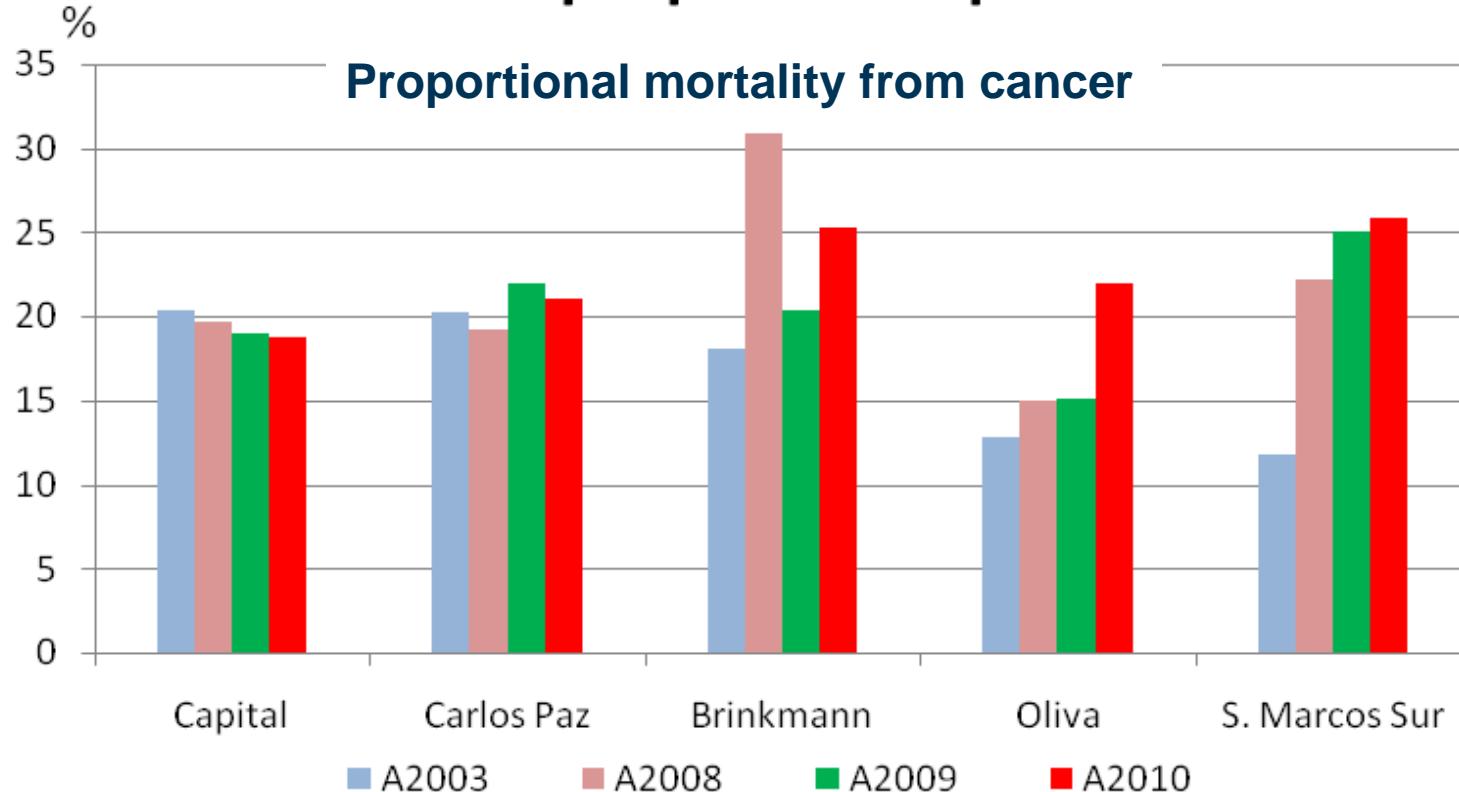


Figura 1. Mapa de riesgo correspondiente a la aplicación y deriva de herbicida pre-siembra (glifosato).



Mortalidad proporcional por cáncer



Registry of Vital Statistics, Cordoba, 2012

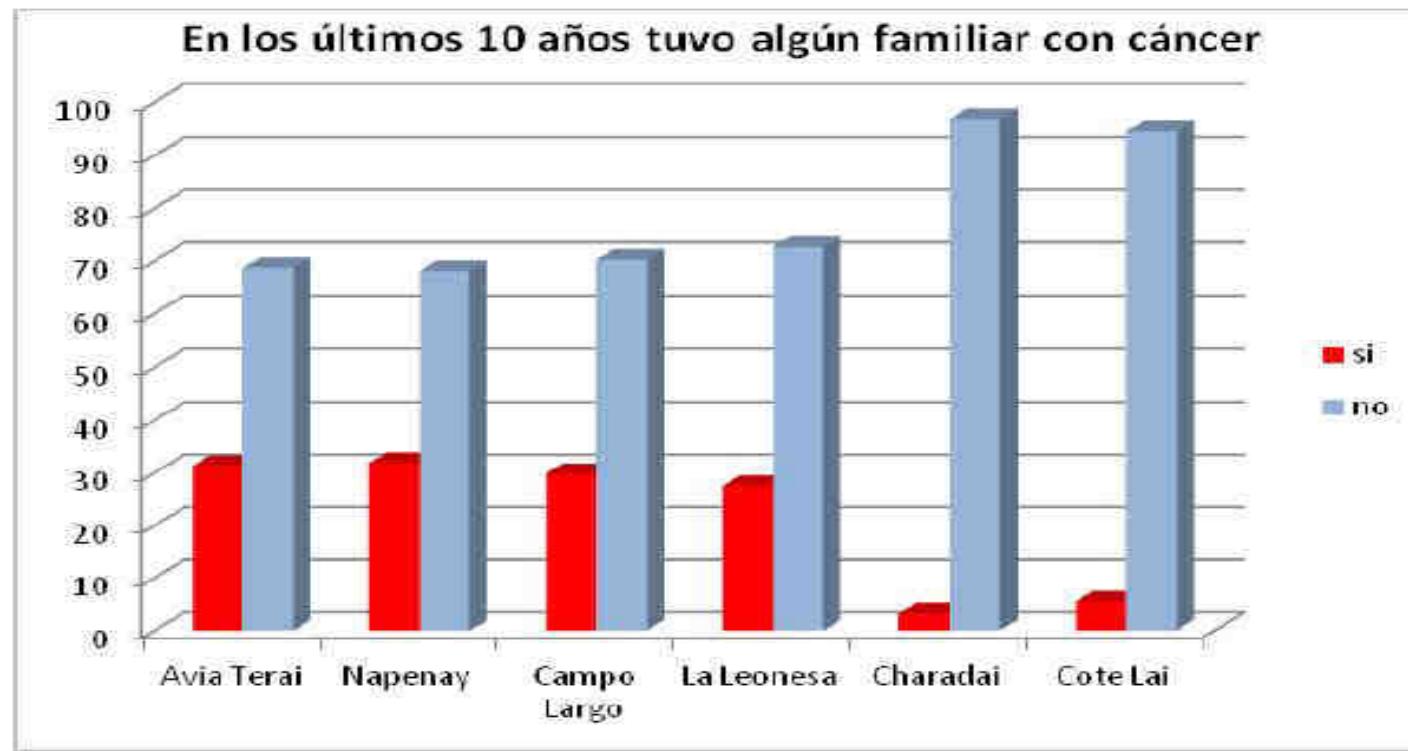
San Marcos Sur 2001: 03 Cancer in 31 deaths . 2012: 13 Cáncer in 31 deaths

Murphy, Santa Fe: Cancer Death Rate 30%, in 2000-2010

San Salvador, Entre Ríos: Cancer Death Rate 47% in 2010, 50% in 2011

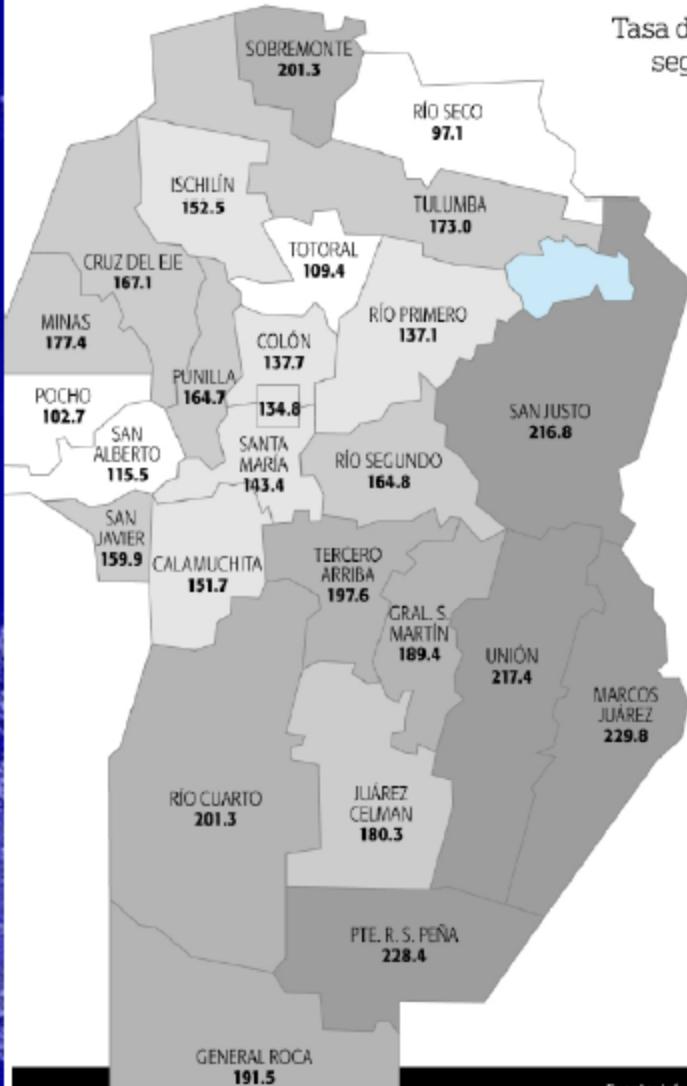
Chaco: Study comparing cancer among 4 towns with soybean crops and 2 cattle towns

**IMAGEN 21: Porcentaje de respuestas positivas a la pregunta:
¿en los últimos 10 años tuvo algún familiar con cáncer?**



Cancer mortality 2004 -2009

MORTALIDAD POR TUMORES



Tasa de mortalidad por tumores
según grupo de edad y sexo.
Provincia de Córdoba.
Período 2004-2009.

54.296

Casos de cáncer fueron registrados
en Córdoba entre 2004 y 2009. De
ellos, 29.513 fallecieron.

+ 65 años

El 45,4 por ciento de los casos se
registró en esta franja etaria. Le siguen
de 25 a 64 años, con el 43,9 por cien-
to. En niños, sólo el 1,1 por ciento.

51,8%

De los casos corresponde a
mujeres. El cáncer de mama
es el más común.

REFERENCIAS

- 97.1 - 115.4
- 115.4 - 152.4
- 152.4 - 180.2
- 180.2 - 201.3
- 201.3 - 229.8

Fuente: Informe de Mortalidad por Tumores en Córdoba,
Dirección de Estadísticas Socio-demográficas, Ministerio de
Planificación, Inversión y Financiamiento de la Provincia de Córdoba.

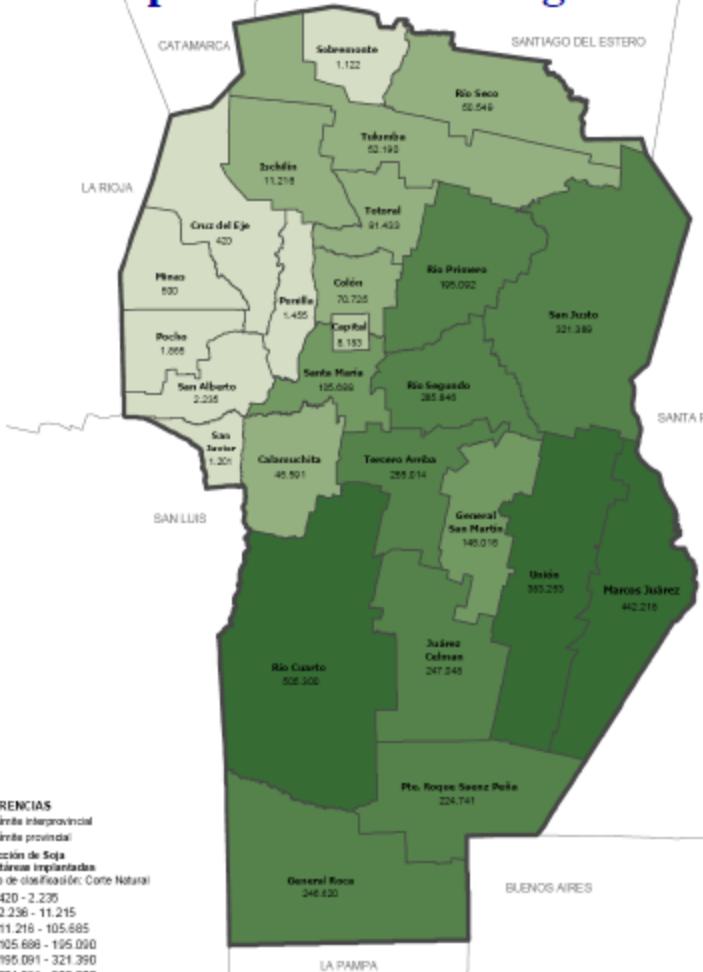
Soybean crops 2007-2008



Provincia de Córdoba
Producción de Oleaginosas
Soja
Campaña Agrícola 2007 / 2008

Dirección General de
Estadística y Censos

<http://estadistica.cba.gov.ar>



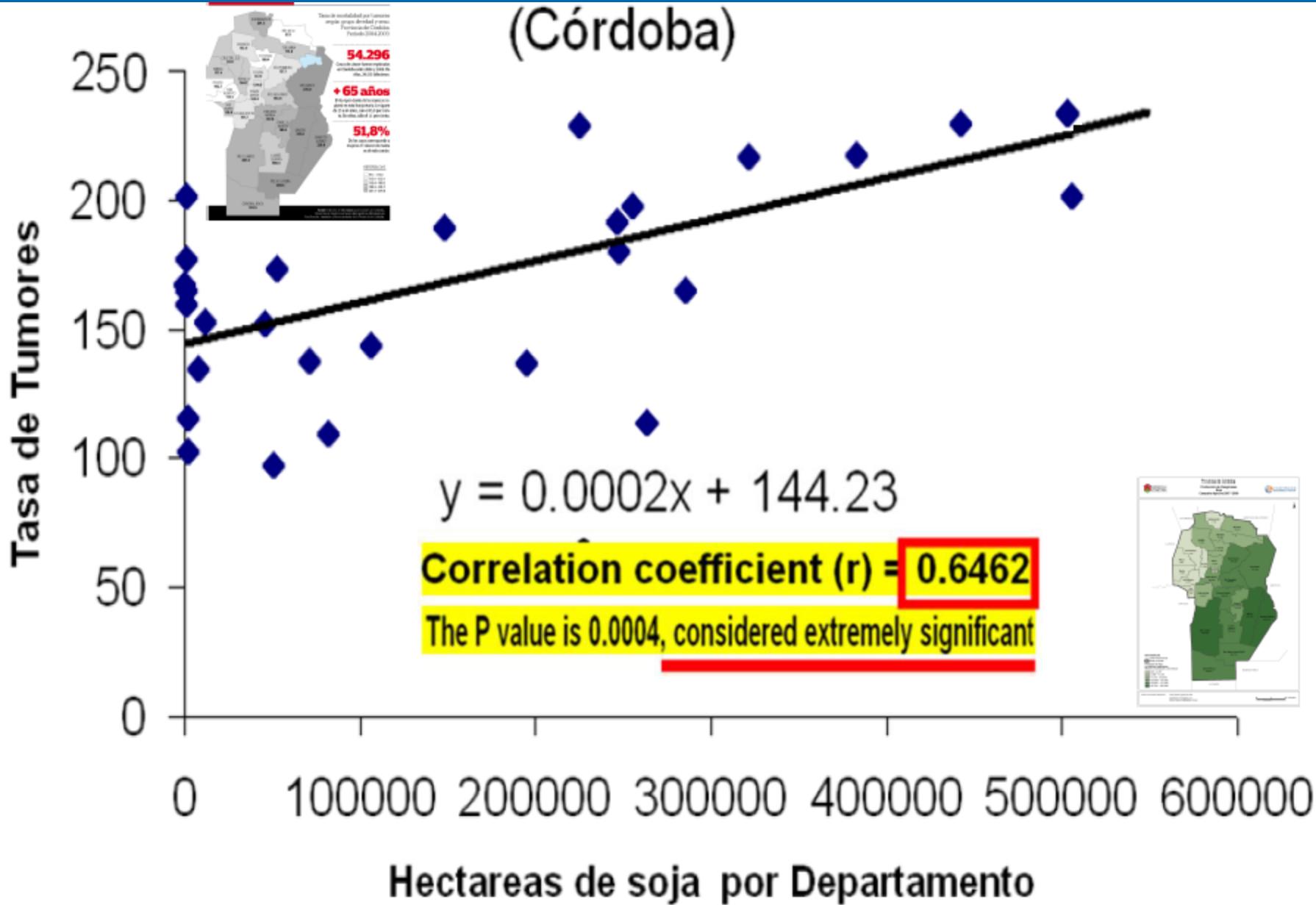
Fuente de información y elaboración:

Dirección Nacional Agropecuaria 2001

Publicación de catálogo y n.o.
Director General de Estadística y Censos

50 Kilometers

Cancer mortality by district 2004 -2009 vs Soybeans planted by district 2007-2008

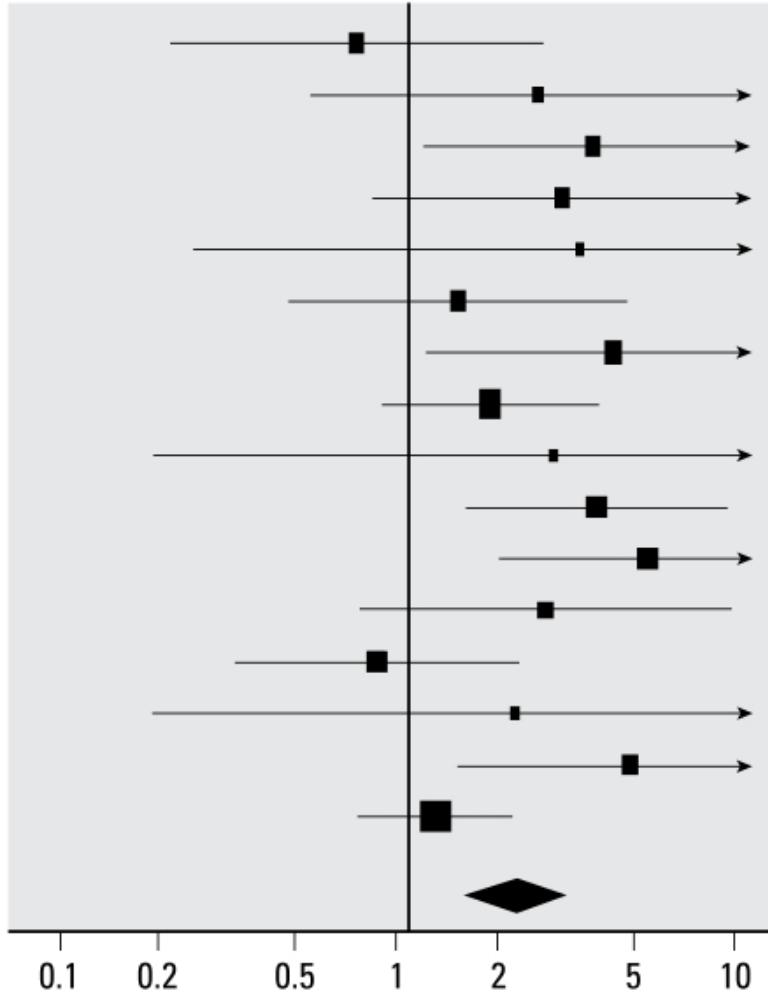


Evidence: Cancer and Agrochemicals

Study name

ORs and 95% CIs

vanS85
Shu88AML
Shu88ALL
Buck89
Dani89
Infa91
Kish93
Stein94
Mein96
Mein00
Alex01AML
Alex01ALL
McKi03
Mene06
Mong07
Ruda07



Childhood leukemia and maternal exposure to pesticides

Wigle DT. Environ Health Perspect.
2009 Oct;117(10)

How do pesticides affect the health of the population?

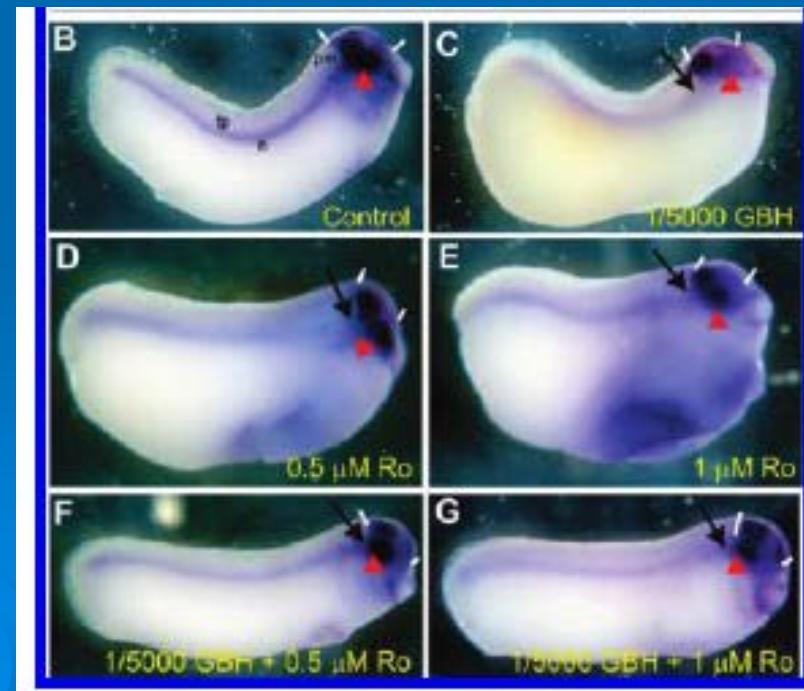
TOXICITY OF GLYPHOSATE

"Glyphosate is less than salted water; it is safe to drink a full glass of Round Up." ---- Lie

Glyphosate is quickly absorbed in humans

it has a plasma half-life of 3.1 hs.

ANDRES CARRASCO; UBA (2010)



Experimental tests with pesticides

Dra. Aiassa (UNRC), Dra. Simonetto (UNL)



Glyphosate produce genotoxicity in mice

It studies the integrity of the genetic material, the DNA

Its alteration is considered a precancerous lesion

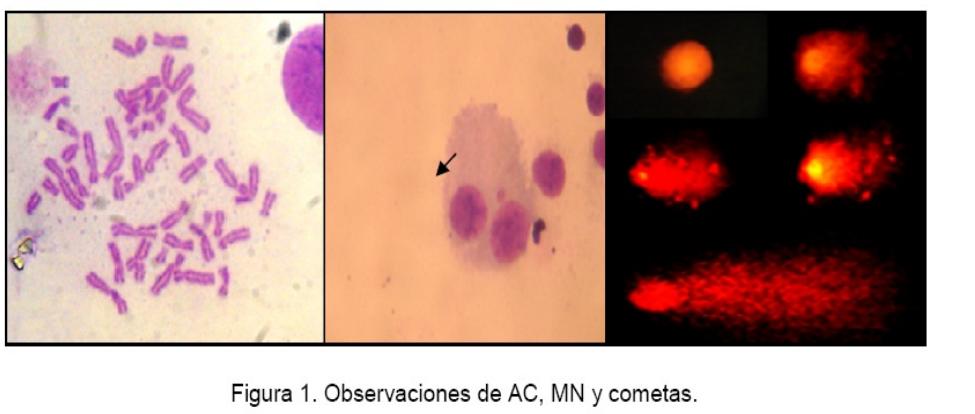


Figura 1. Observaciones de AC, MN y cometas.

J. Appl. Toxicol. 2008

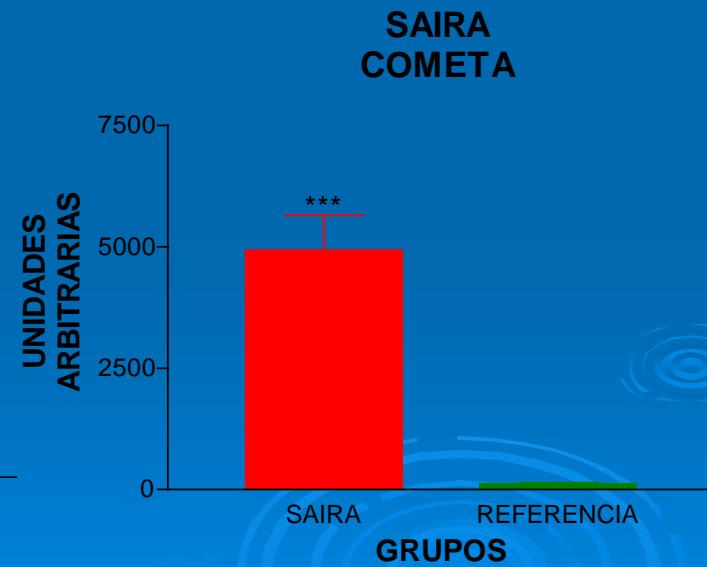
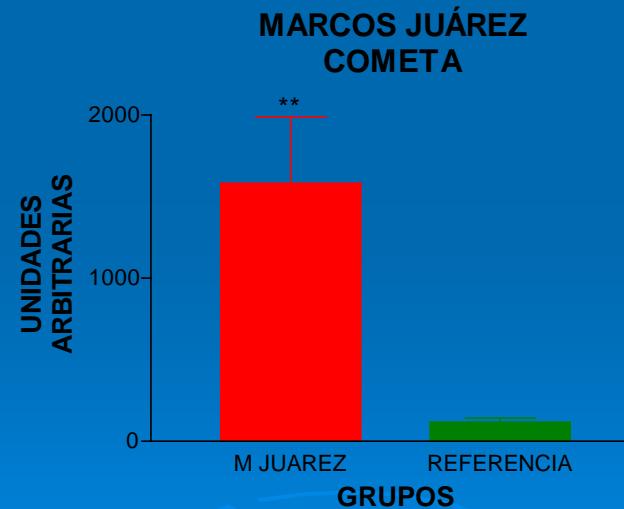
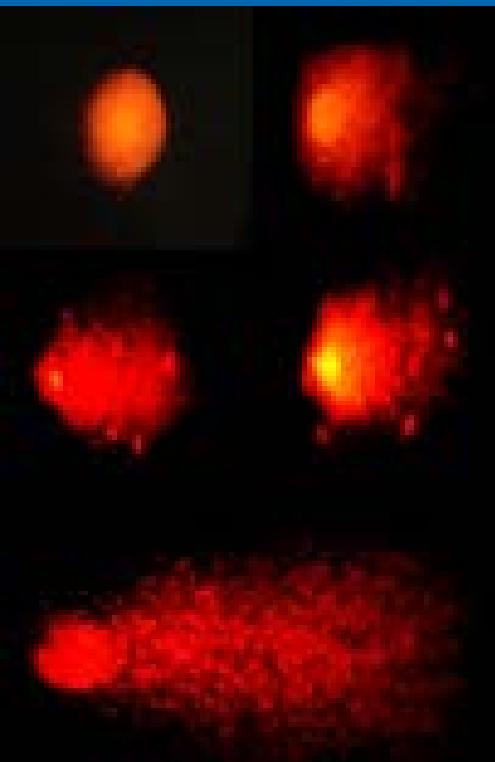
*Journal of Basic & Applied Genetics, (2009)
20 (1): 09-13*

Chromosome aberrations, micronucleus and Comet assay

Experimental tests with pesticides

Dra. Aiassa (UNRC)

People from Río Los Sauces, Las Vertientes, Saira, Gigena, and Marcos Juárez, compared to non-fumigated people from Río Cuarto



Comet assay with human lymphocytes

Assessment of the level of damage to the genetic material of children exposed to pesticides in the province of Córdoba

Dra Delia Aiassa, Dr. Fernando Mañas (UNRC) Arch Argent Pediatr 2015;113(2)

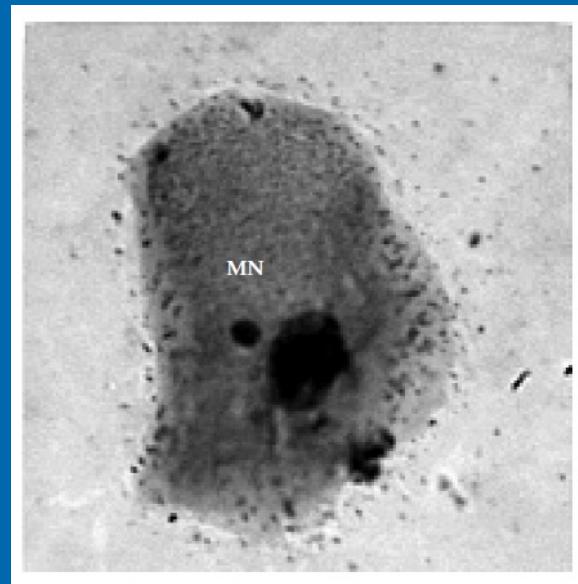
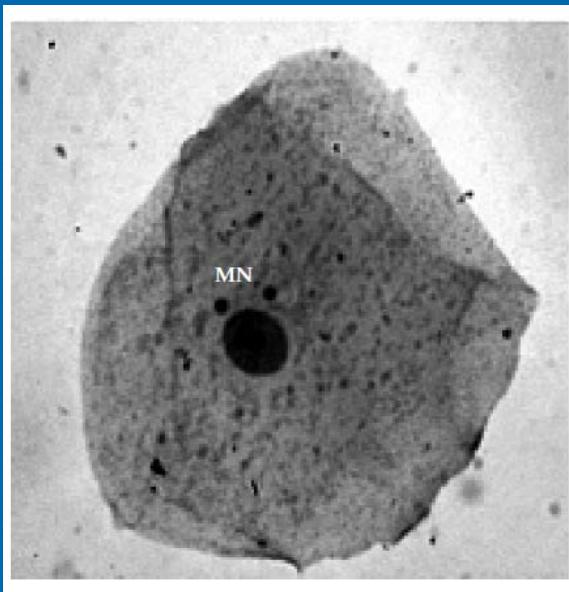


TABLE 1. Mean micronucleus frequency per 1000 buccal mucosa cells in studied groups

Group and place of residence	Distance from areas where spraying was used	n	Distance from place of residence (mean \pm SD)	MN/1000 cells
Group 1 Marcos Juárez	Up to 500 m	27	166.7 \pm 11.62	5.59 \pm 0.75*
	More than 500 m	23	1095 \pm 146.4	4.74 \pm 0.91
Group 2 Río Cuarto	More than 3000 m	25	3320 \pm 192.7	3.36 \pm 0.63*

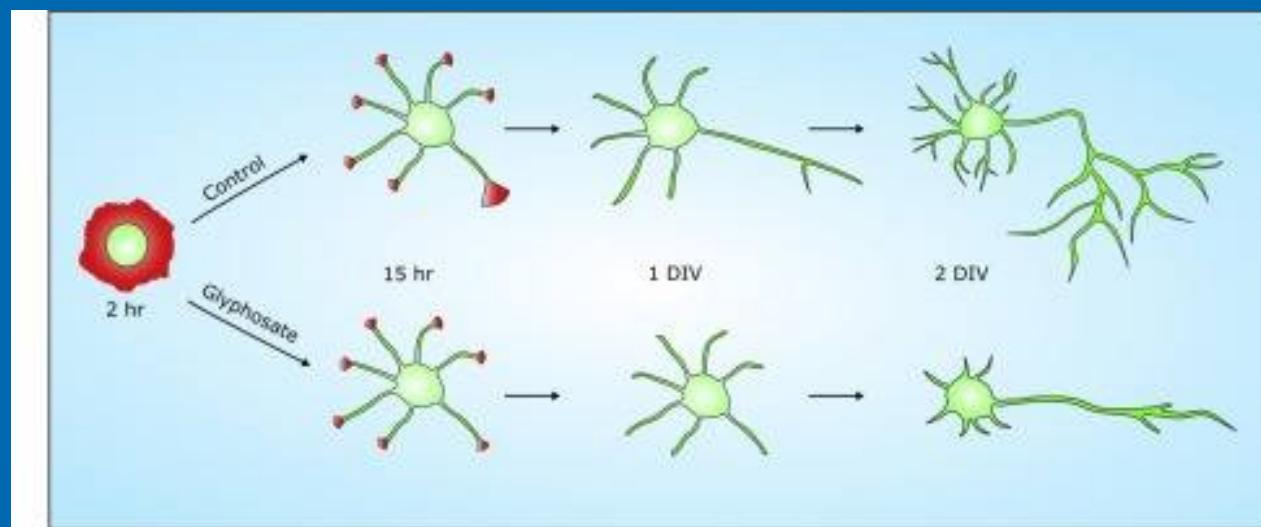
* Statistically significant compared to group 2.

MN: micronuclei.

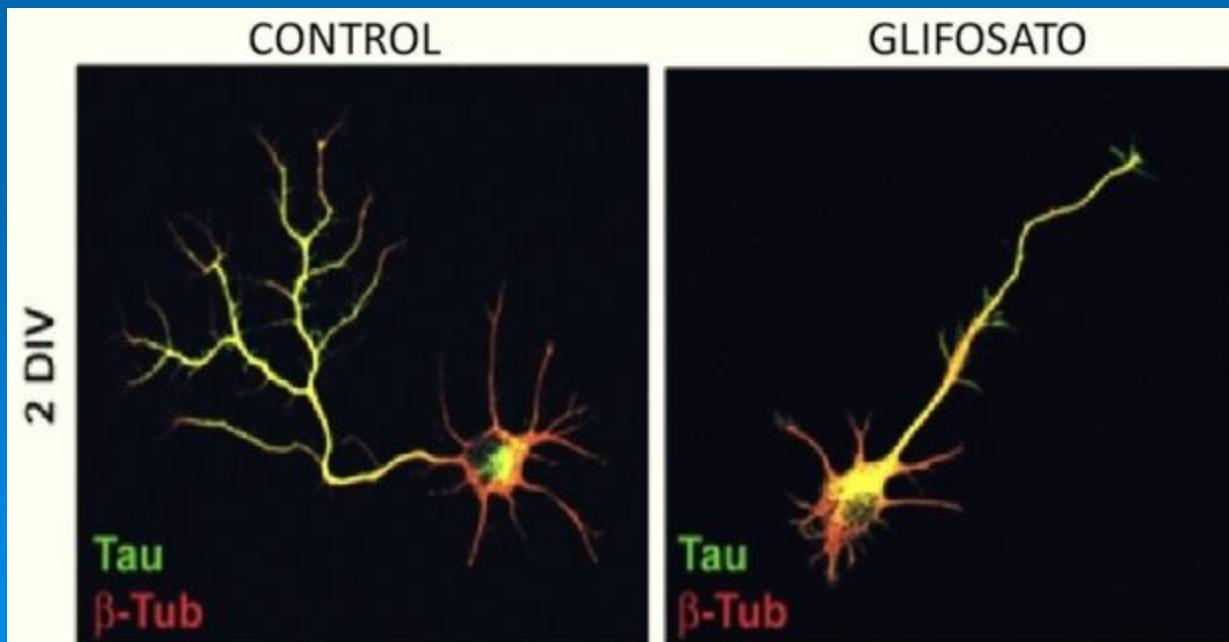
Marcos Juarez children have 58% more genetic damage

Neuronal development and axon growth are altered by glyphosate through a WNT non-canonical signaling pathway.

Coullery RP¹, Ferrari ME¹, Rosso SB².



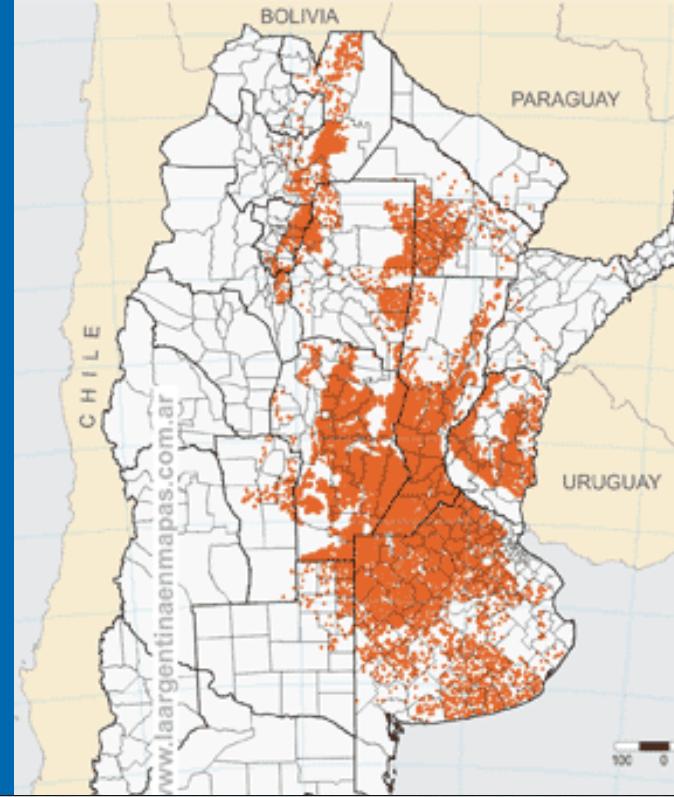
Glifosato altera el desarrollo y crecimiento de las neuronas



Who are affected

12 million inhabitants
in 25 million hectares
with Soybean crops

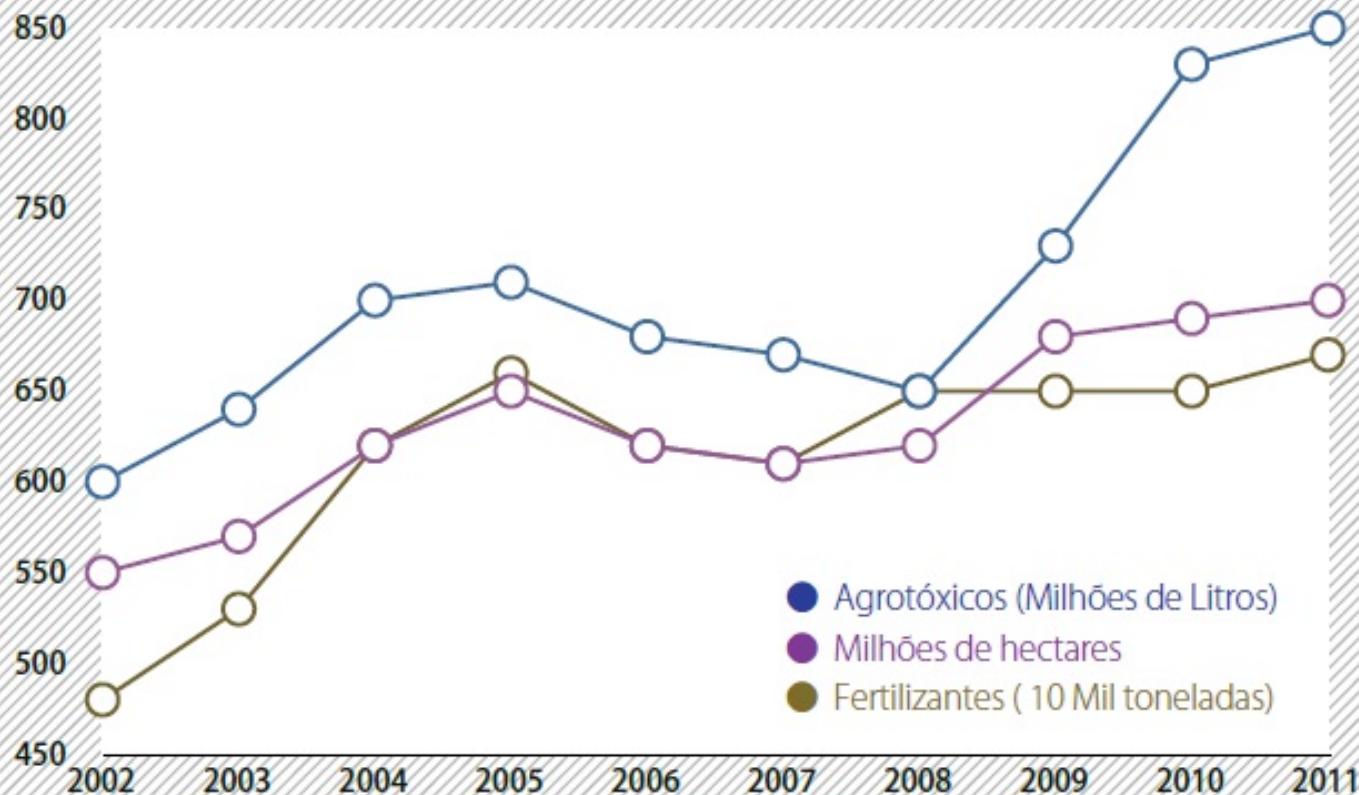
*most affected
agricultural workers
poor peasants
or native peoples
women and children*



environmental inequality

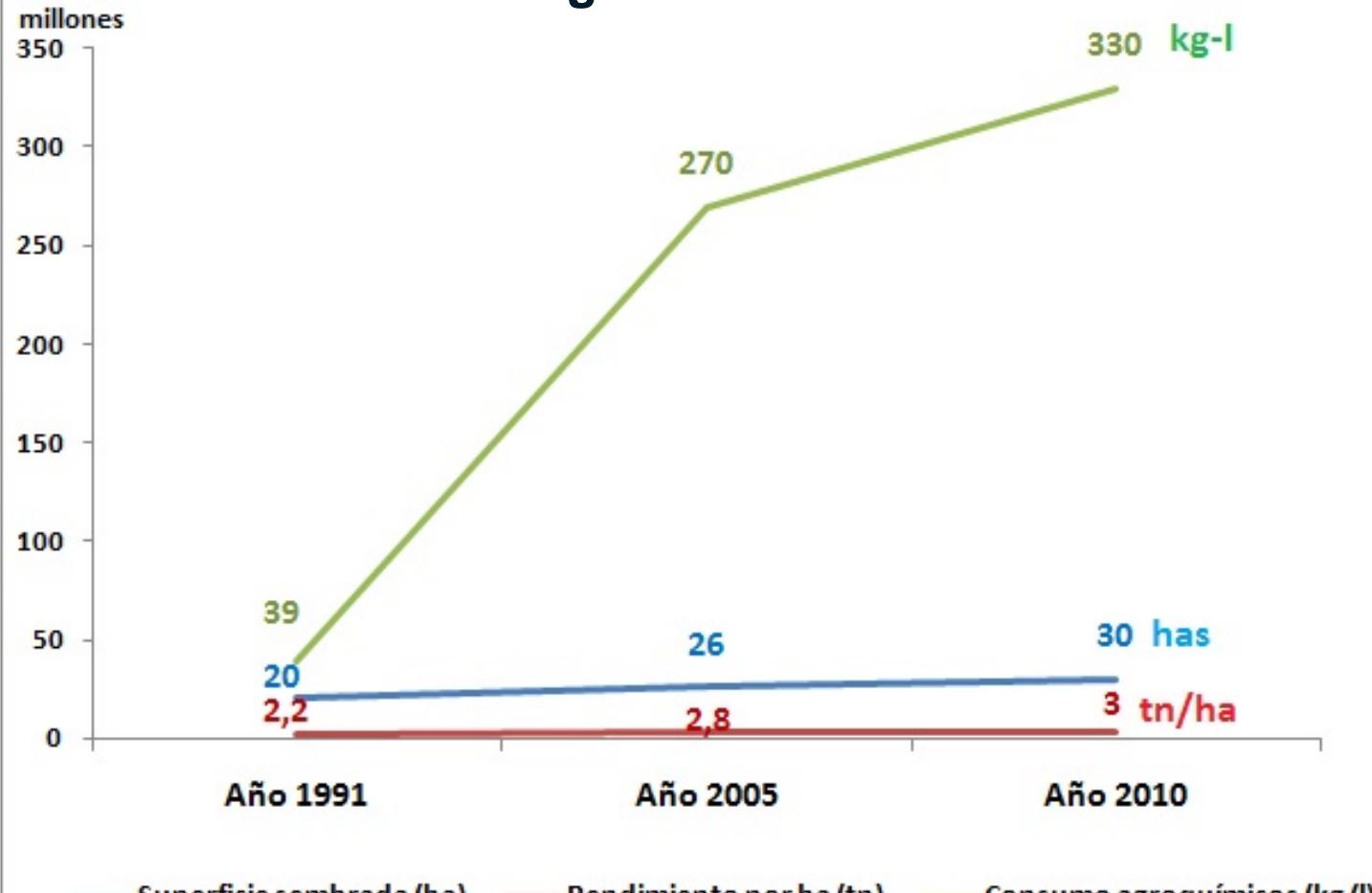
Cultivation area and consumption of pesticides in Brazil

FIGURA ① Produção agrícola e consumo de agrotóxicos e fertilizantes químicos nas lavouras do Brasil, de 2002 a 2011



Fonte: SINDAG (2009; 2011), ANDA (2011), IBGE; SIDRA (2012) e MAPA (2010).

Evolution of agricultural indicators

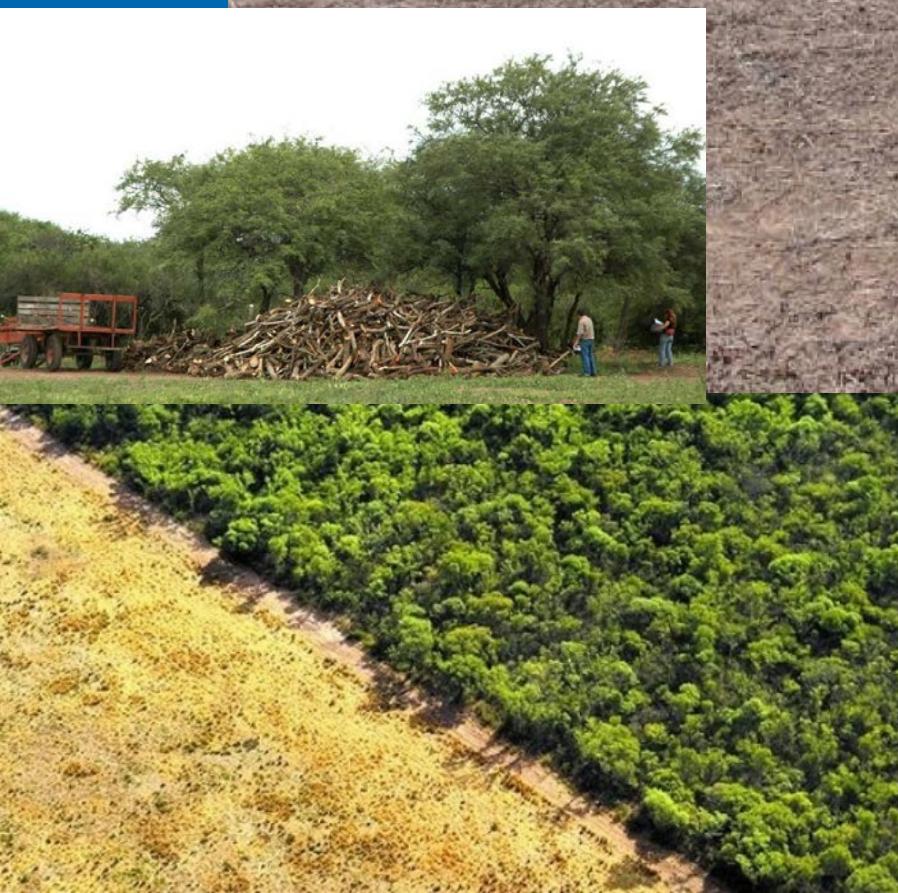


The cultivated areas increased **50%**, from 20 million to 30 million h.

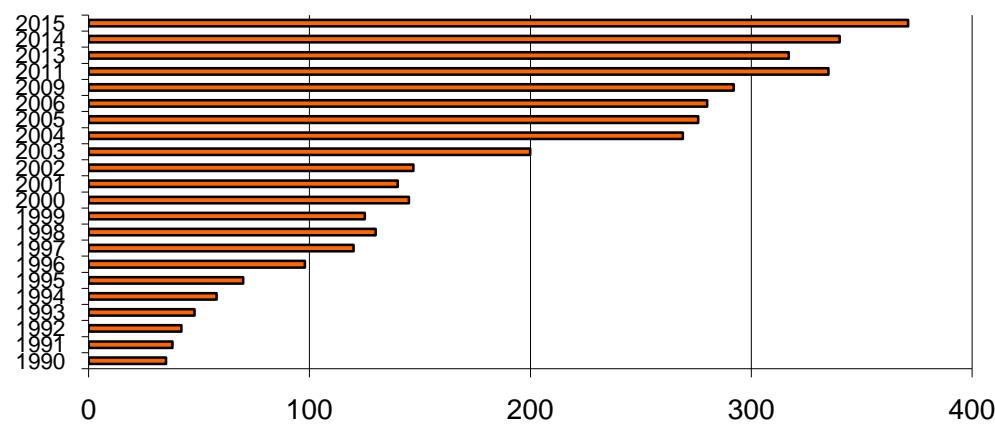
The average yield increased **36%**, from 2,2 T per ha to 3 T per h

The use of toxic agrochemicals increased **958%**.

Glyphosate in Argentina
260 millones kg for year
6,5 kg for inhabitant



Aumento en el uso de Agrotóxicos



Martes, 15 Noviembre 2016 10:05

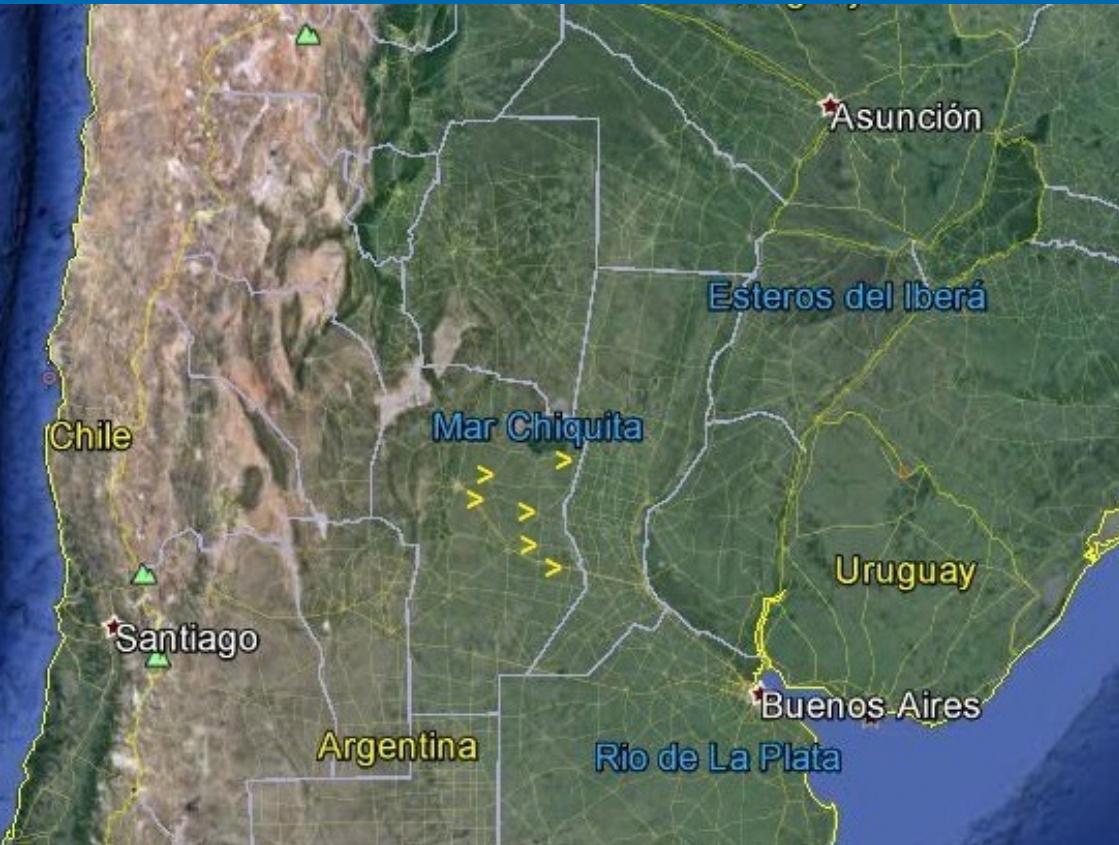
I.Luiggi (La Pampa): Ya van 180 vacunos muertos intoxicados por beber agua con herbicida





www.distritointerior.com.ar

Llueve glifosato - It rains glyphosate



In USA the concentrations of
glyphosate ranged from
0.2 to 2.5 µg/L in rain samples

School of Public Health, University
of Minnesota, Minneapolis,
Minnesota, USA

([Chang FC](#), [Simcik MF](#), [Capel PD](#)) Mar 2011

In Argentina, the University of La Plata detected glyphosate in 100% of the rain samples between October 2012 and March 2013

The concentrations of glyphosate ranged from 14 to 69 ug/l in rain samples



40 %

HOW MANY GENES DO WE SHARE?



60 %

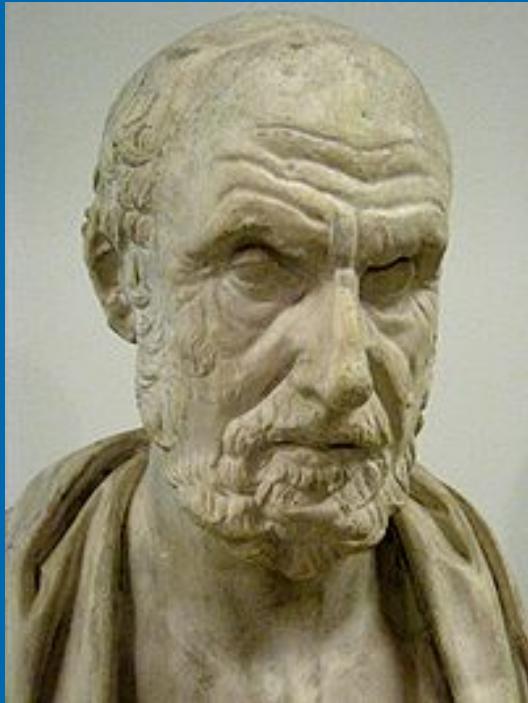
Nature does not reinvent the wheel.

When it finds a way of doing things, they will be repeated throughout the entire evolution.



85 %

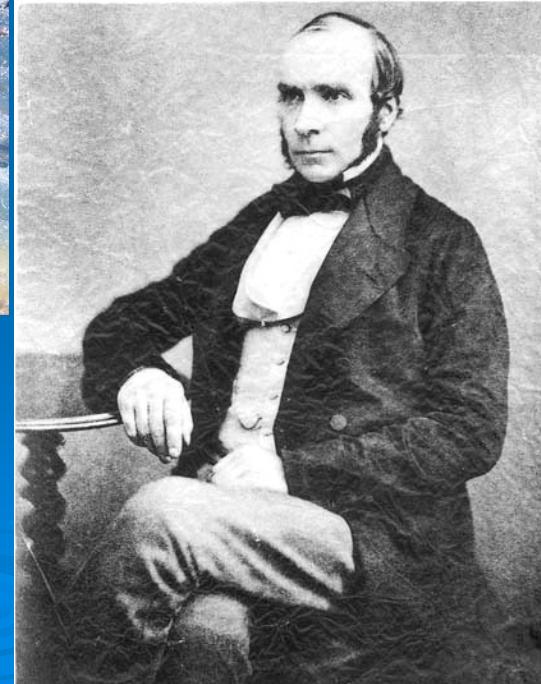
Attacking weeds, insects or rodents is equal to attacking ourselves.

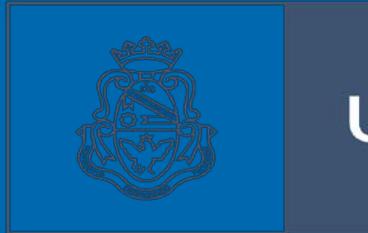


„On the air, waters and places”
Hipócrates 400 AC



Cholera epidemic in London
John Snow 1850





UNC

Universidad
Nacional
de Córdoba



Team-Camp Monte Mais, Oktober 2014

Monsanto was kicked out of Cordoba



We are not environmentalists
No somos ambientalistas



Somos la ballenas
We are the whales





RED UNIVERSITARIA DE AMBIENTE Y SALUD

reduas.fcm.unc.edu.ar | Médicos de pueblos fumigados



Gracias