AGRITECHNICA 2013

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Argentine farming production:

No till crop with residue cover Precision Farming

Ing. Agr. (MSc) Mario Bragachini
Ing. Agr. Andrés Méndez

INTA

Website: www.cosechaypostcosecha.org;
www.agriculturadeprecision.org

- **INTA (National Institute of Agricultural Technolgy)**

is a public decentralized body

from the Minister of Agriculture

ORGANIZATION

- ➤ **Headquarters**

- ➤ **15 Regional Centers**

- ➤ **50 Experimental Stations**

- ➤ **5 Research Centers**

- ➤ **16 Research Institutes**

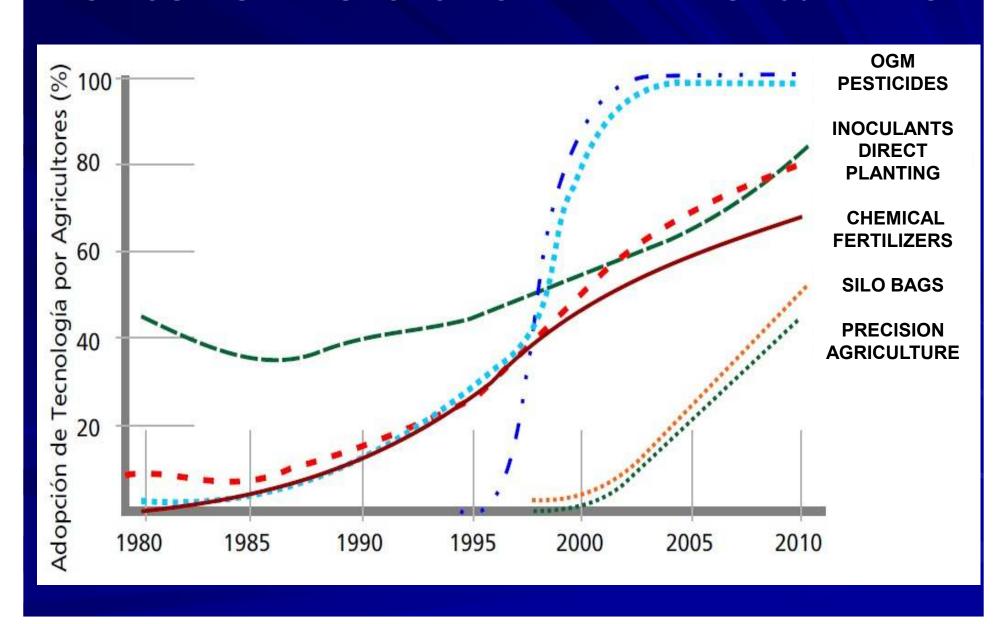- ➤ **> 300 Extension Units**

- ➤ **2 Private Organizations**

EVOLUCIÓN DEL ÁREA CULTIVADA Y PRODUCCIÓN EN ARGENTINA

EVOLUTION OF THE TECHNOLOGY ADOPTION IN THE AGRICULTURAL SECTOR OVER THE LAST 30 YEARS

- **Argentina has a territory of 3,8 Millions / km^2**

- **The population is 40,4 millions of inhabitants**

- **Cropping area is 34 millions of hectares**

- **Agricultural, livestock and agro-industry production is of the utmost importance for the country´s economy:**

  - **Grains: 105 M tons**
  - **Pip fruits: 1,93 M tons**
  - **Citrus: 3,3 M tons**
  - **Honey: 115.000 tons**
  - **Wines: 2,6 M tons (219.000 has)**
  - **Milk: 11,4 M liters (2,15 M heads)**
  - **Poultry: 1,6 M tons**
  - **Beef: 2,6 M tons (49 M heads)**
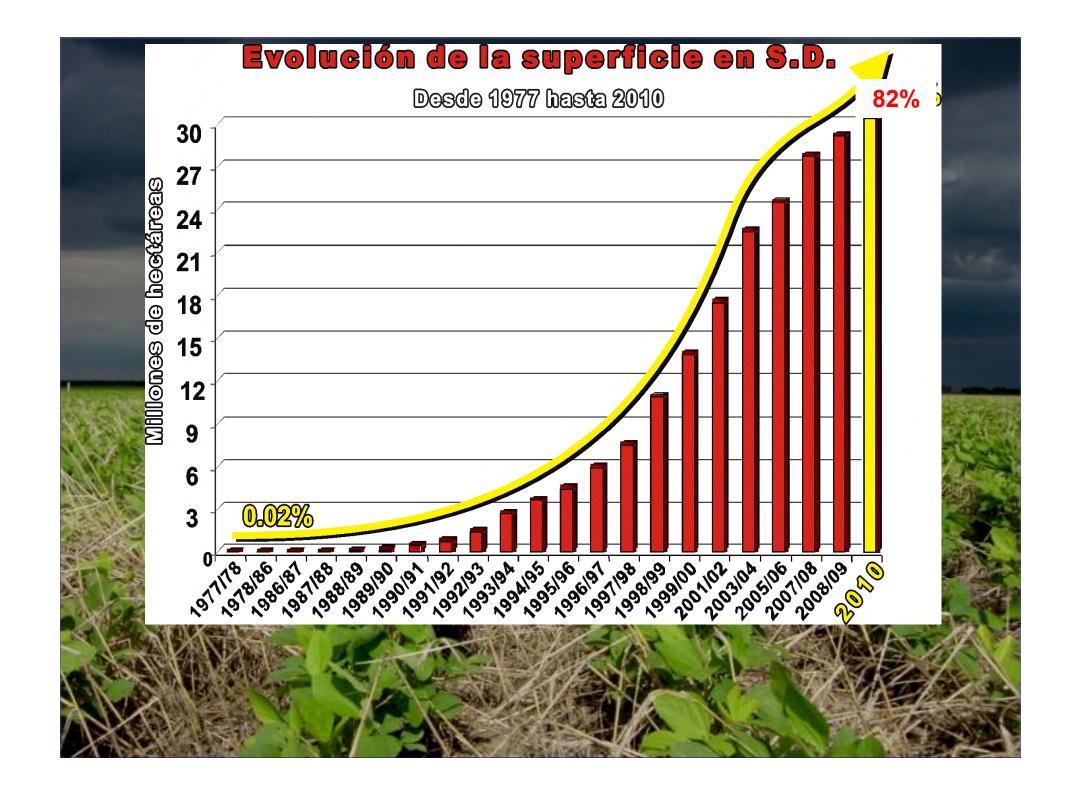 - **Pork 281.000 tons (3 M heads)**

AGRICULTURAL PRODUCTION

The most important characteristic of the Argentine Agriculture,

is the DIRECT PLANTING

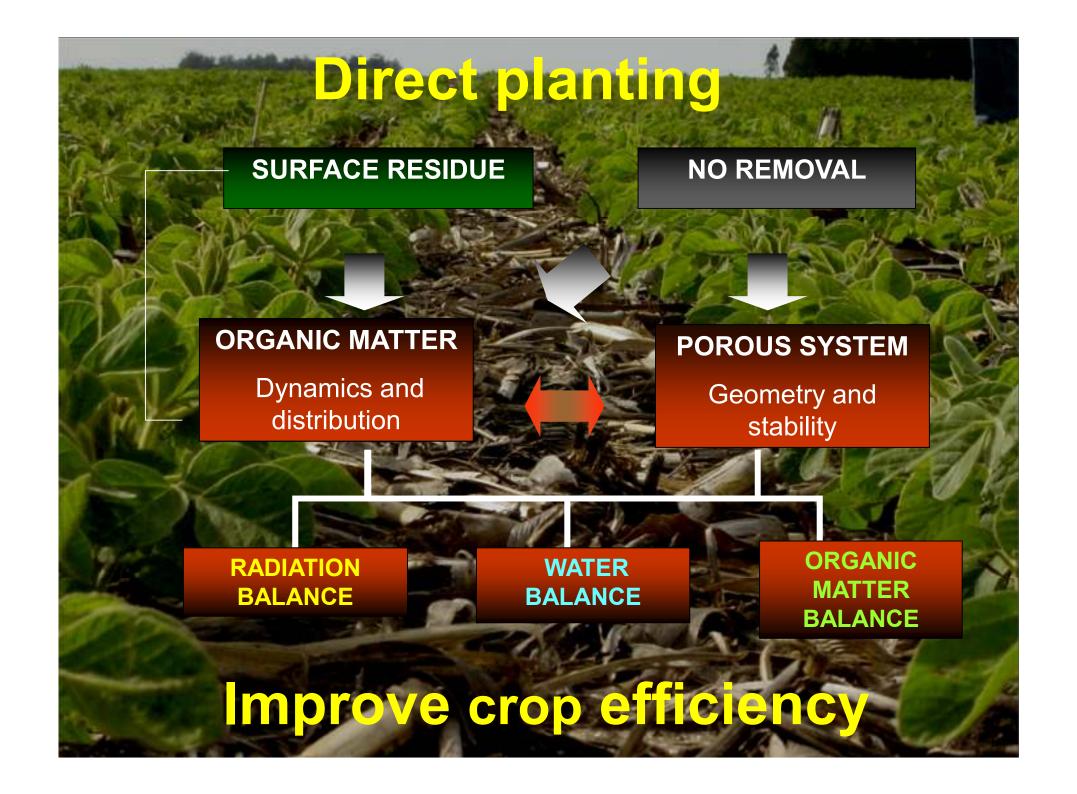**which has contributed to make considerable advances in production**

This system has helped to increase agriculture profits under sustainable production

Evolución de la superficie en S.D.

Desde 1977 hasta 2010

Millones de hectáreas

82%

0.02%

30
27
24
21
18
15
12
9
6
3
0

1977/78 · 1978/86 · 1986/87 · 1987/88 · 1988/89 · 1989/90 · 1990/91 · 1991/92 · 1992/93 · 1993/94 · 1994/95 · 1995/96 · 1996/97 · 1997/98 · 1998/99 · 1999/00 · 2001/02 · 2003/04 · 2005/06 · 2007/08 · 2008/09 · 2010

Advantages of Direct Planting for Agriculture

- Improves water absorption in soil

- Increases efficiency in the use of production resources

- Decreases formation of surface crusts

- Protects against erosion (90% less to traditional tillage)

- Improves organic matter balance

- Increases planting opportunity

- Provides greater yield stability

- Reduces the tractors use (66%)

- 40% reduction in fuel consumption against traditional tillage

- Is a system that helps to get profits for the food footprint (low carbon and rational use of resources)

Direct planting

SURFACE RESIDUE

NO REMOVAL

ORGANIC MATTER

Dynamics and distribution

POROUS SYSTEM

Geometry and stability

RADIATION BALANCE

WATER BALANCE

ORGANIC MATTER BALANCE

Improve crop efficiency

Direct Planting is the technology that seeks water economy and soil conservation.

Every mm of water useful for crops that is saved, means in average:

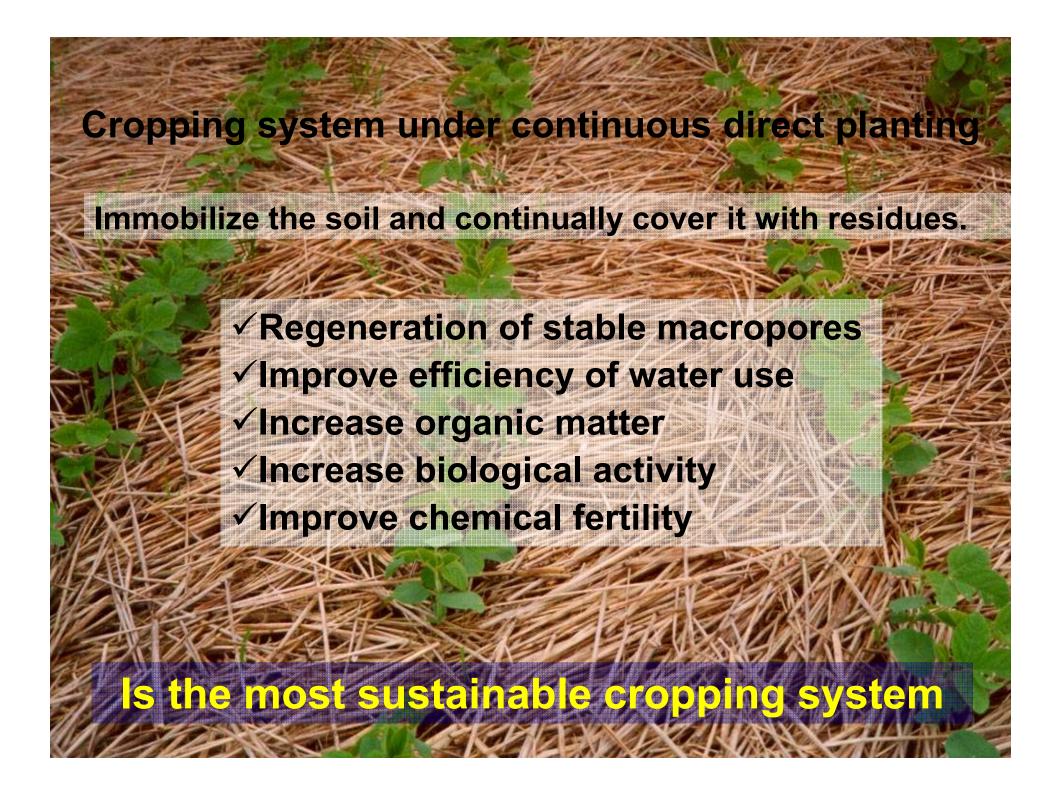|		
20 kg/ha of Maize	2000 kg/ha	
17 kg/ha of Sorghum	1700 kg/ha	
6 kg/ha of Sunflower	600 kg/ha	100 mm
7 kg/ha of Soybean	700 kg/ha	
11 kg/ha of Wheat	1100 kg/ha	
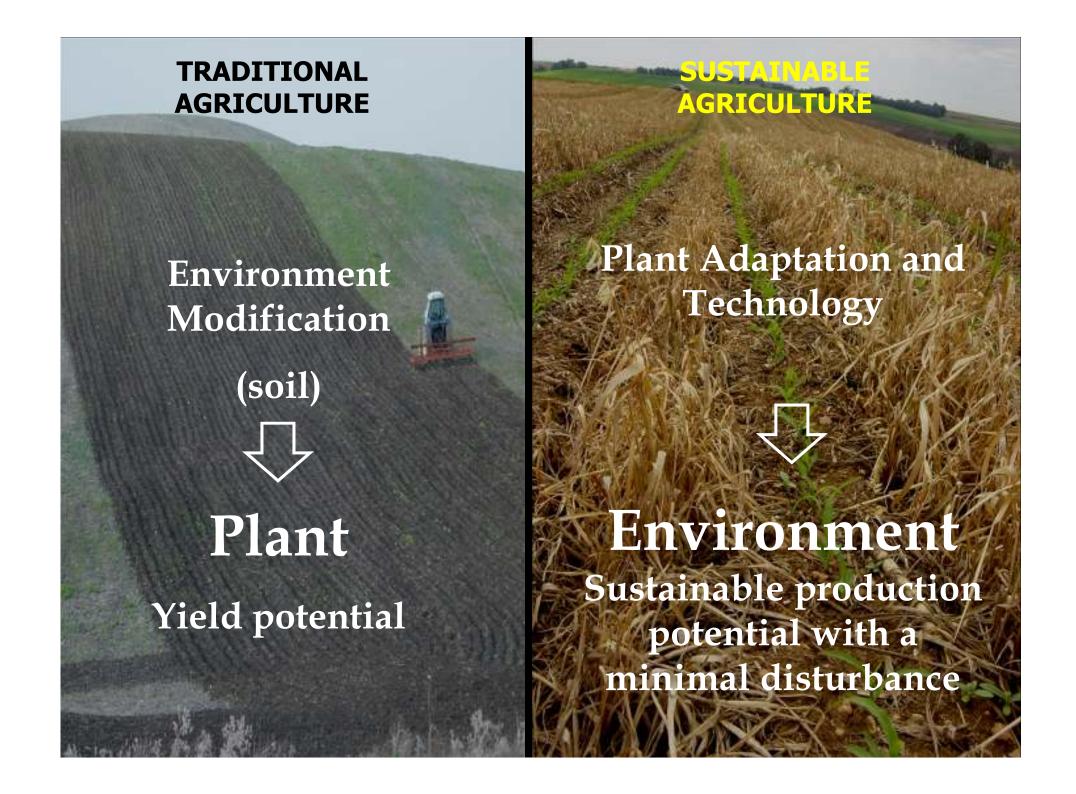
In Argentina, an average of 100-150 mm/year of rain water is saved due to "non till technology".

Adjusting rotation for greater soil Carbon capture, based on a better use of water and an adequate organic matter balance

roots rotation

Cropping system under continuous direct planting

Immobilize the soil and continually cover it with residues.

✓ **Regeneration of stable macropores**
✓ **Improve efficiency of water use**
✓ **Increase organic matter**
✓ **Increase biological activity**
✓ **Improve chemical fertility**

Is the most sustainable cropping system

TRADITIONAL AGRICULTURE

Environment Modification

(soil)

⇩

Plant

Yield potential

SUSTAINABLE AGRICULTURE

Plant Adaptation and Technology

⇩

Environment

Sustainable production potential with a minimal disturbance

Agricultural Machinery
for sustainable agriculture
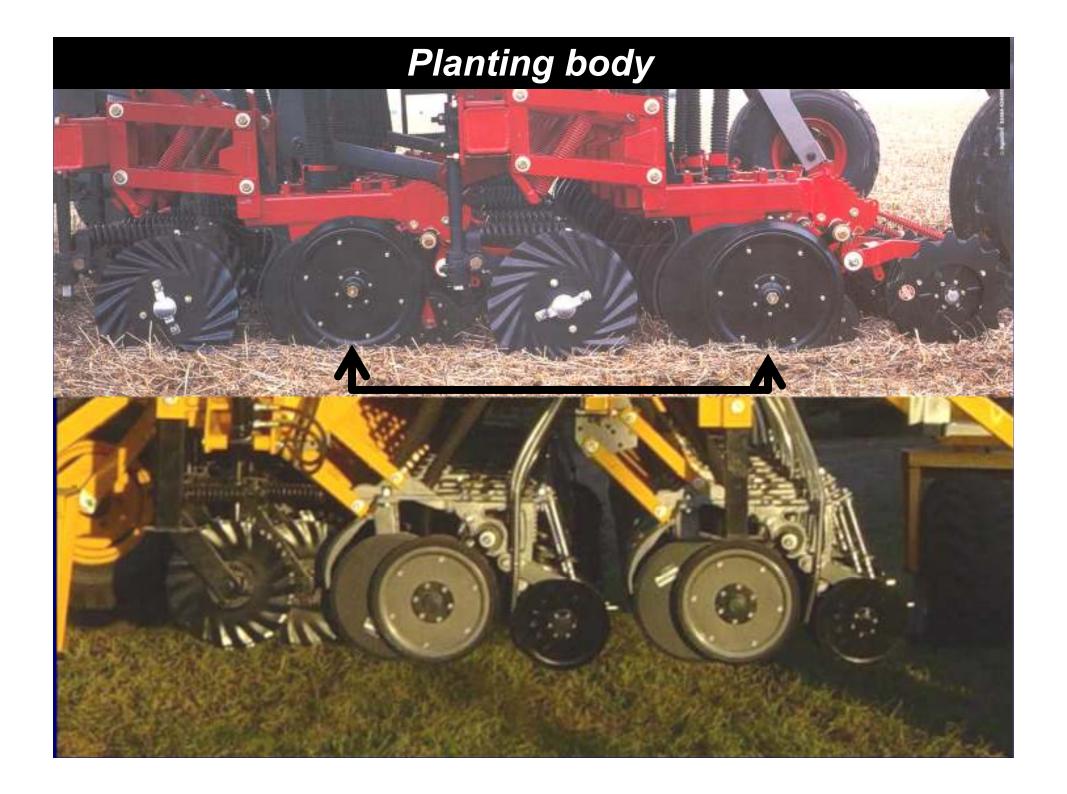
Argentina produces food for 400 millions of world`s population

- The agro-machinery is one of the most significant components of the grain, beef meat and milk Argentine production systems.

- Argentina is one of the most competitive grain producing countries in the world. Is evident that Argentine machinery is well designed and constructed for a sustainable agriculture.
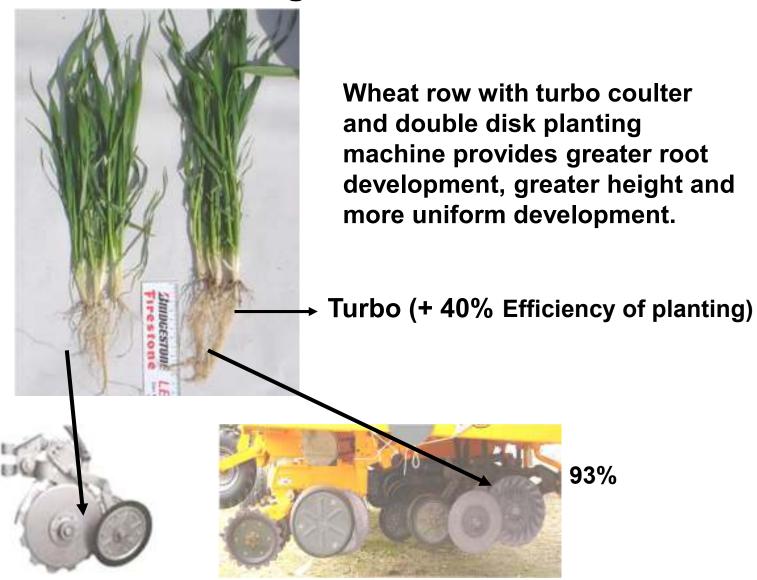
MACHINERY

Seeders

Sprayers

Combine

Planting body

Difference in roots development with different sowing units

Wheat row with turbo coulter and double disk planting machine provides greater root development, greater height and more uniform development.

Turbo (+ 40% Efficiency of planting)

53%

93%

Agroshowroom
South Africa
Ukraine
Russia
Italy
Other 15 countries

SPRAYERS

Four-wheel steering, variable trial, pneumatic suspension.

Wind tunnel and automatic pilot.

Individual nozzle led lighting for working at night

GRAIN TRANSPORT

Wagons:
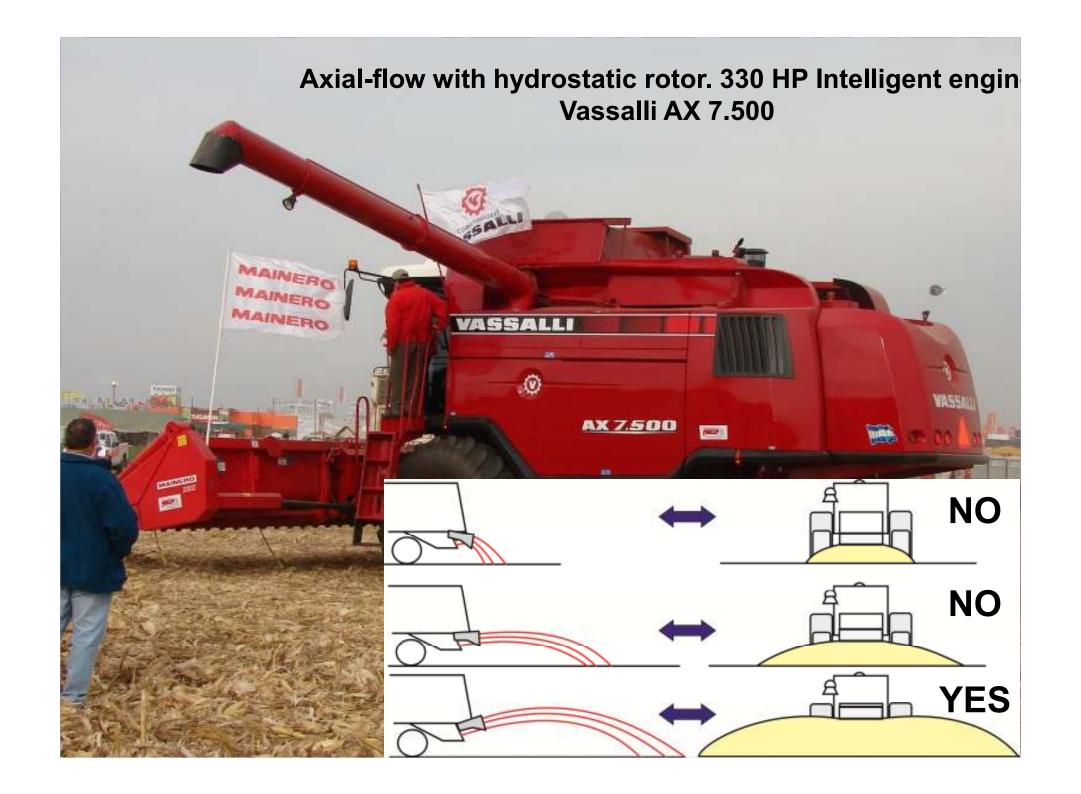## *In a non till system, the grain should be transported with the less aggressive way to the soil (compact)*

HARVESTING

Uniformity of crop residues distribution.

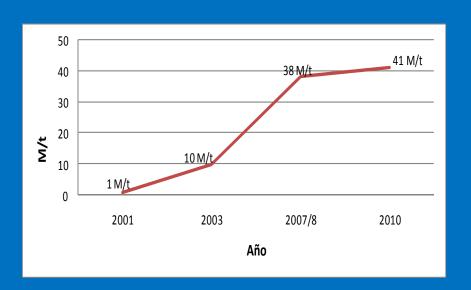**Reduction of machinery transit and low pressure tyres**

Axial-flow with hydrostatic rotor. 330 HP Intelligent engine. Vassalli AX 7.500

Corn headers

Sunflower headers

GRAIN STORAGE

Storage with modified atmosphere:

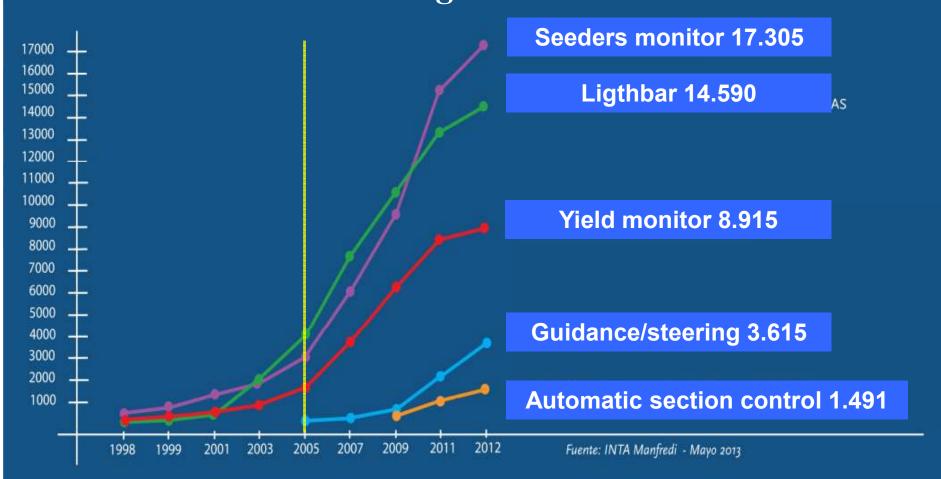The grain bagging system reduces cost and makes more efficient the harvesting process.

Argentina is the first country in the world to adopt storage of grains in plastic bags:

45 M tons in 2012.

Is exported to 54 country.

12° International Precision Farming course

17,18 y 19 de Julio 2013

Hacia una agroindustria más eficiente

La Red de Agricultura de Precisión, liderada por el INTA, integra a los actores del sector para transformar a la AP en una herramienta que, con sustentabilidad social y ambiental, beneficie la productividad y la competitividad de la cadena de agroalimentos de la Argentina.

Recopilación de datos georrefenciados

La tecnología de información vinculada al posicionamiento satelital permite obtener datos georreferenciados de distintos sitios de un lote y conocer así su variabilidad.
Ejemplos de datos a recolectar:
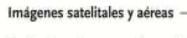
Procesamiento de la información

Los datos recolectados se procesan con software especializado y permiten elaborar diferentes mapas o modelos del lote, con información precisa de sus distintas áreas.

Delimitación de las zonas de manejo

En base a los modelos obtenidos y con la experiencia del productor se traza un **mapa de manejo diferenciado**, que identifica sitios con distinto potencial y requerimiento de insumos y tareas.

Técnicas de manejo variable

El mejor conocimiento de la variabilidad posibilita planificar una gestión "a medida" para cada zona del lote, con beneficios económicos y ecológicos.

Imágenes satelitales y aéreas
Carta de suelo y mapa topográfico
Muestreo de suelo
Mapa de conductividad eléctrica
Rendimiento de cultivos anteriores
Mapa de proteína y contenido de aceite
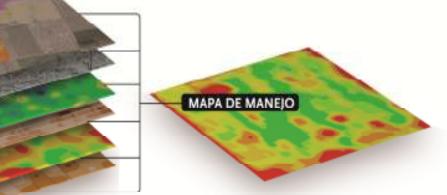
MAPA DE MANEJO
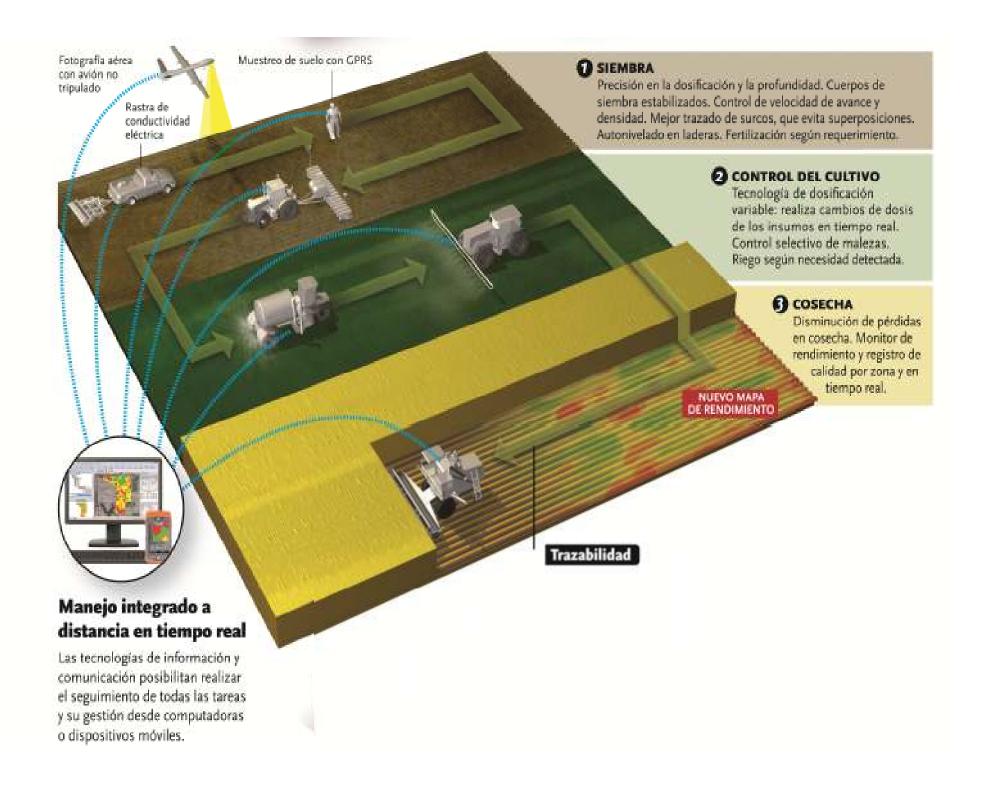
MÁQUINAS PRECISAS
Para un aprovechamiento óptimo del manejo variable es necesario ajustar la maquinaria para explotar todo su potencial e incorporar gradualmente nueva tecnología de precisión.

Instituto Nacional de Tecnología Agropecuaria

Ministerio de Agricultura, Ganadería y Pesca
Presidencia de la Nación

INTA

Fotografía aérea con avión no tripulado

Rastra de conductividad eléctrica

Muestreo de suelo con GPRS

❶ SIEMBRA
Precisión en la dosificación y la profundidad. Cuerpos de siembra estabilizados. Control de velocidad de avance y densidad. Mejor trazado de surcos, que evita superposiciones. Autonivelado en laderas. Fertilización según requerimiento.

❷ CONTROL DEL CULTIVO
Tecnología de dosificación variable: realiza cambios de dosis de los insumos en tiempo real. Control selectivo de malezas. Riego según necesidad detectada.

❸ COSECHA
Disminución de pérdidas en cosecha. Monitor de rendimiento y registro de calidad por zona y en tiempo real.

NUEVO MAPA DE RENDIMIENTO

Trazabilidad

Manejo integrado a distancia en tiempo real

Las tecnologías de información y comunicación posibilitan realizar el seguimiento de todas las tareas y su gestión desde computadoras o dispositivos móviles.

Variable rate systems

Monitors

AGRIFOOD PROSPECTIVES
On the way to 2020

Feeding 600 million people in the world
In a sustainable way
- ✓ Preserving natural resources and the environment .
- ✓ Improving the FOOD FOOTPRINT

Thank you !!!!