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Agustin Bianchini, a technical agronomist with AAPRESID in Argentina, specializes in nutrient management under no-till in a climate similar to Kansas, and has studied agronomy in the U.S.

We are here because the soil unites us

"…Helping to improve the soil and to produce more, no-till beautifies nature; the gray fields get full of life, birds return to their nests and the water from the creeks flows pure to the sea. It is so little what we have to do for seeing the most beautiful fruit God can give us: AN ETERNAL SOIL".

Carlos Crovetto, Arequito (Argentina) 1998

The Argentine Association of No-Till Farmers (AAPRESID) is an institution formed by people that are part of agricultural businesses that try to obtain profitability from our activity and to participate responsibly in the society we are part of. We are worried about nature preservation and proud that our activity is important for feeding the humanity, contributing also to the development of Argentina.

We feel privileged for living from a noble activity that has a clear sense, and provides an indispensable service; even if we have problems like others do.

Fortunately, we found in no-till a way of producing that enthusiast us, and in AAPRESID a mission that goes beyond us: to participate the goals we reached with the others.

"Something in common that is the soil is uniting us. It is a new concept that we are trying to introduce: to treat the soil with more attention, a little bit friendlier, to dedicate time to it and to study it much more. The soil requires our attention, not only there is in the soil the possibility of extracting nutrients and food that requires the human being. That is one of the functions that it should have, but we have to take care of it, because it is a natural resource considered renewable and there is our mistake; we have treated the soil like a transitory tool that produces, without considering that it may be exhausted when it is wrongly treated".

Carlos Crovetto

We are here because the soil, that is the sustenance of our activity, unites us. The soil is a resource considered renewable, but was never treated alike. For that reason we remember the words of a Chilean farmer, that always visits us, who many know, and that lighted in many of us, that flame of gratitude and respect for the soil.

We want to take advantage of this space and this meeting time with the visitors to give them our vision of agriculture, from the agriculture that was and the one we are building.

We also want to emphasize the support of the companies related to our activity that have understood that a sustainable world is possible and that it is not a bad business. We want to thank them all for the permanent support in our activities.

The challenge of producing without degrading

Like Edward H. Faulkner mentioned in his book The senseless of the farmer, "**…nobody has ever mentioned a scientific reason for plowing**".

Conventional agriculture, whose main characteristic is tillage, has permitted during many years to feed the world; but has brought a series of inconveniences related to environmental conservation, like soil erosion and degradation.

While conventional agriculture was not intensive, the environment was degraded and modified the atmosphere; but when it was intensified, fertilizers were used without limits and chemicals without reason, and these both brought contamination and lost of biodiversity.

Agriculture always had the extremely important function of feeding a growing humanity. In the past this problem was solved incorporating new soils (horizontal expansion of agriculture). "But today this objective goes against the necessity of conserving the resources needed for the agro ecosystem functioning and our desire to maintain the most untouchable possible what remains from natural ecosystems" (Solbrig, 1999).

The present and future agriculture's challenge is to produce the food needed for a growing humanity in the actual agricultural area, which implies an intensification, without affecting the agro ecosystem and preserving the existing natural ecosystems.

Agriculture must be then, **PRODUCTIVE**, for feeding the humanity, it must be **SUSTAINABLE**, for preserving the environment and biodiversity; and **PROFITABLE,** so it can be a reality and not a utopia.

For that reason, we cannot propose systems that preserve the environment sacrificing productivity, because the consequence is hunger, we neither can make productive proposals sacrificing the environment, that exhaust the soils, the aquifers and produce contamination. Anyway, the agricultural proposal that better adapts will be circumstantial, it will be adequate for a moment, for a status of the knowledge and the problems.

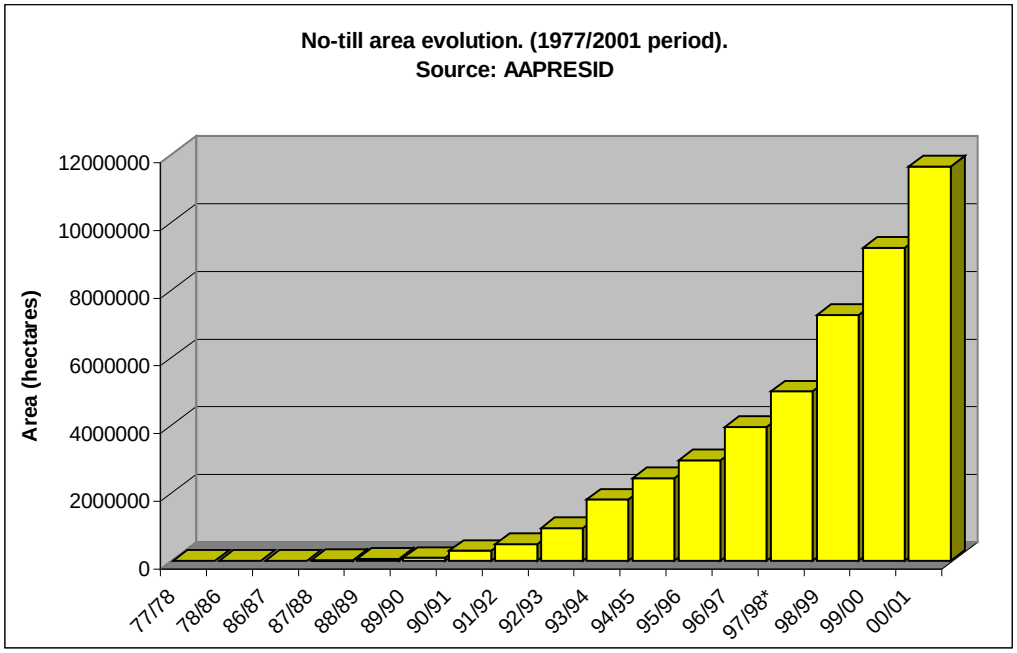
In this context, we propose the no-till system, as an improving system for the actual agricultural problems, for being productive, sustainable and profitable.

Evolution of the no-till area

The no-till area has shown in the last ten years a steep increase. In that period of time we moved from a few hectares to more than 11 million, representing in the present time more than 46% of the national agricultural area (AAPRESID, 2000).

These numbers were increased in the 2000/01 season following the trend shown until present time. Projections based on data from previous years made us presume that for the year 2010, approximately 75% of the agricultural area in Argentina will be cropped with no-till.

At the present time, there are no limiting factors for the growth of this productive system, so it is highly probable that these projections became true in the mentioned time period.

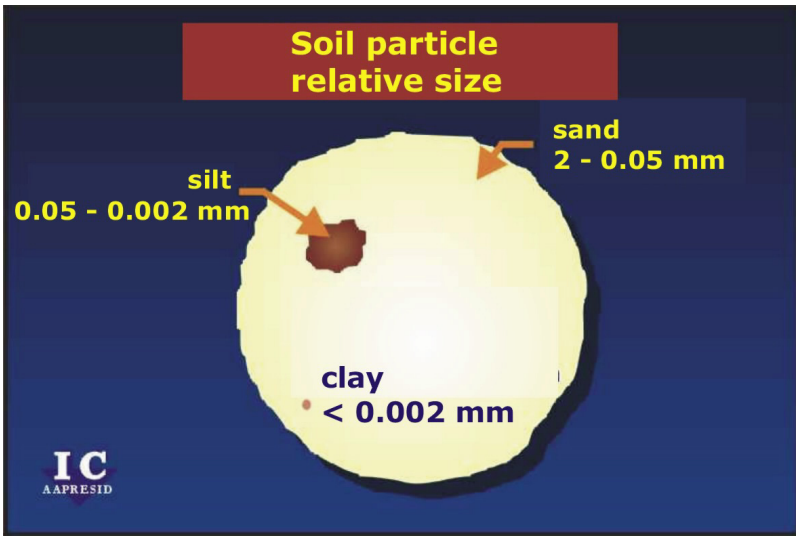


No-till and the soil

The soil is the main resource that as farmers we have, and consequently the preservation is fundamental for the business viability in the future. If we want to achieve this objective, we first need to know and understand the way the soil system works.

The soil is a porous system

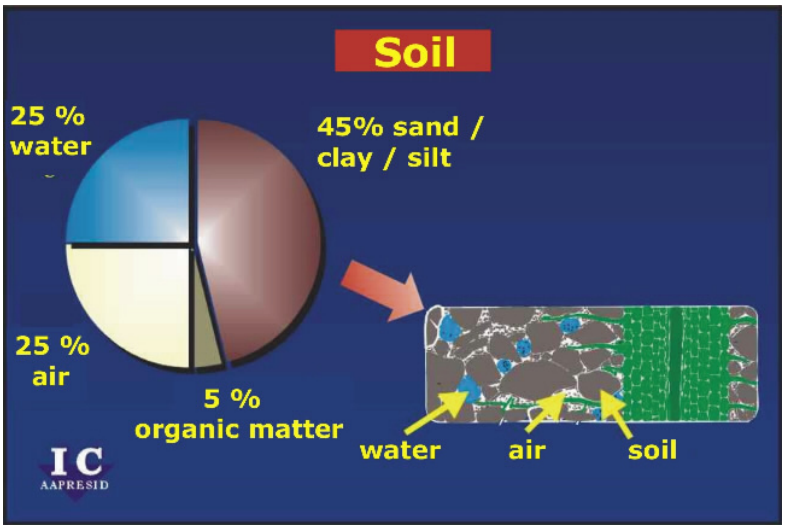
The different constitutive particles of the soil (sand, silt and clay) can be present in different proportions in the different soils. This property is called **texture**. The farmer practically cannot change this parameter, but must know it because it will give different characteristics to the soil, like the total capacity of water accumulation and the water movement in the soil matrix.



These particles are also together forming aggregates. This property is called **structure**.

The particle order and the space left between aggregates allow the formation of interconnected galleries that are called pores. Depending on the pore size, they will have water storage functions, air circulation functions, or mixed functions. Tillage alters the natural order of the structure, breaking also the continuity of the porous space.

On the other hand, no-till does not have artificial tillage, so it maintains the pore network similar to a natural situation. Furthermore, when the different crop root systems decompose, new biological pores with high stability will be added, because they are covered by the residues of microbial decomposition (humus).



Finally, a soil in continuous no-till and with rotations that include different root systems, will allow having a spongy soil, with a stable, continuous and interrelated pore network.

Water economy:

No-till is characterized by the lack of tillage and the presence of a vegetative residue cover, which has a direct impact in crop water use efficiency.

First, the residues protect the soil from the impact of the raindrop. We need to consider that the energy stored in each drop is discharged over the residues, instead of doing it directly over the soil surface. If this last phenomenon occurs (typical of fields managed with conventional tillage), superficial aggregates explode, dispersing its constitutive particles. These particles will be deposited inside the soil pores, forming a thin soil crust practically impermeable, which decreases infiltration notoriously. This phenomenon is known as “soil sealing” or “soil crusting”.

In no-till systems, the previous process does not occur, so infiltration is favored.

Second, the presence of surface residues decreases the surface water drainage. Consequently, water erosion risks are fewer. This also makes more water to infiltrate and less water is lost in the lower landscape position areas, making a more homogeneous profile wetting in the different landscape positions.

Finally, the residue cover minimizes water losses by direct soil evaporation. So, the crop that is growing at that time will mainly use the stored water.

Higher infiltration, lower evaporation, plus a structured soil that retains more moisture, make the no-till system very efficient in the use of the most limited resource in dry land production agriculture, water.

The importance of organic matter

The organic matter is a fraction of the soil solid components. Its importance is crucial in the resource productivity, and consequently it is a priority to conserve it and, if possible, to increase its amount.

The organic matter participates in the cycle of several nutrients, like nitrogen and sulfur, impacting in the soil chemical fertility.

It also has electrical charges that increase the cation exchange capacity, also related to chemical fertility.

On the other hand, some of the more stable fractions are joint with the soil particles forming aggregates that are the basis of soil structure. This will allow the soil to be adequately aerated and to have good moisture retention.

The organic matter is also a substrate for the meso and micro fauna, allowing the soil to have life.

But, what can we do as farmers to improve the organic matter levels? First, the lack of tillage does not violently oxygenate the soil. Consequently, there are no organic matter oxidation peaks, typical in conventional tillage systems. So, we decrease the organic matter losses with no-till. On the other hand, if we use a rotation that adds an important amount of dry matter, we will be increasing the only important entrance to the soil that favors organic matter accumulation. So, it is fundamental to adequately select the crop sequence and to maximize productivity. More residues mean more possibilities of accumulating organic matter in the soil.

For more information:

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