



tonuttigroup

Innovative farming since 1864

New farming technologies

Productivity & Conservation Agriculture

Today's solutions, for tomorrow's sustainability



FOOD DEMAND INCREASE

Today more than six billion people rely on food grown on just 11% of the global land surface. By 2030, the world population is expected to be over 8 billion people. The UN Food and Agricultural Organization estimates farmers will have to grow 30% more grain than today.

SOIL DETERIORATION

Erosion, decline in organic matter, sealing, compaction, decline in biodiversity... are major environmental threats to the production capacity and the sustainability of agricultural soils world-wide. Scientists at the International Soil Reference and Information Center (ISRIC) in the Netherlands estimated in 1991 that humankind has deteriorated more than 19,4 million square kilometres of lands.

LOW DISTURBANCE & UNDER-SURFACE SEEDING: A new conservation agriculture practice

The CYCLON straw harrow and the QUASAR air seeder are new generation machines that have been engineered after several years of field observations and field tests to maintain crop residues on the soil surface.

These low disturbance machines eliminate or limit tillage needs while promoting the wellknown advantages of conservation agriculture, such as protecting the soil, maintaining and increasing its natural fertility...

IN EUROPE:

- 115 million hectares or 12% of Europe's total land area are subject to water erosion and 42 million hectares are affected by wind erosion¹
- The average soil erosion rates in Europe (about 17 ton/ha per year) greatly exceed the average rate of soil formation of about 1 ton/ha per year. The intensification of conventional agriculture (increased mechanisation, ploughing, over-tilling) over the past 50 years has contributed substantially to this trend².

¹ Commission of the European Communities. 2006. Thematic Strategy for Soil Protection,

² ECAF: The European Conservation Agriculture Federation - Conservation Agriculture in Europe: Environmental, Economic and EU Policy Perspectives.



The **COLLOVATI OPENER**[®] that equips the **QUASAR** seeder, places the seed under the surface of residues for optimal seed germination



The **CYCLON** straw harrow manages crop residues, controls weeds and/or promotes seed germination (from weeds & previous crop) during the intercrop period



Working principle



The COLLOVATI OPENER®

Winner of an award for technological innovation EIMA 2008



With the following motivation: "Guarantees the closing of the seed furrow without the need of closing system even in presence of crop residues"

The seeding element COLLOVATI OPENER® has been developed based on physical rules of dynamics. Its functionality is not influenced by the following factors: work speed, soil type and condition.

Compare to other types of seeding element, its mechanical simplicity offers low maintenance costs and the capacity to operate on no-tilled soils even with high quantities of crop residues.

Optimum seed placement

High seed-to-soil contact, no hairpinning*

The Collovati Opener® has the unique capability of positioning the seed directly under crop residues. Seed is placed in contact with the ground on the horizontal seed bedding, to allow for optimal seed germination. Residues are not mixed into the seed furrow. The hairpinning* effect is non-existent.

**Hairpinning: residues being pushed into the seed furrow by disc systems, reducing the % of seed germination and on dry and windy days the moisture is drawn up from the furrow through residues.*

Roots are part of the plant's motor: with the under-surface seeding technique, residues do not disturb the proper development of the roots system which improves the health of the plant.





Economic benefits

- Saving in time: reduction of tillage needs - average of € 80,00/ha per year*
- Saving in energy: reduction of tractor Hp requirements which reduce fuel consumption - average of € 45,40/ha (fuel only) per year*
- Reduction in production cost
- Reduction in equipment needs
- Less equipment maintenance needs

**TOTAL average
of € 125,40/ha
per year**

* data collected up to 2008 from several years of observations and field tests in collaboration with users of the QUASAR air-seeder

Environmental benefits

Reduction total of CO₂ emissions = at 1527,58 kg/ha per year.

Significant decrease in fuel consumption

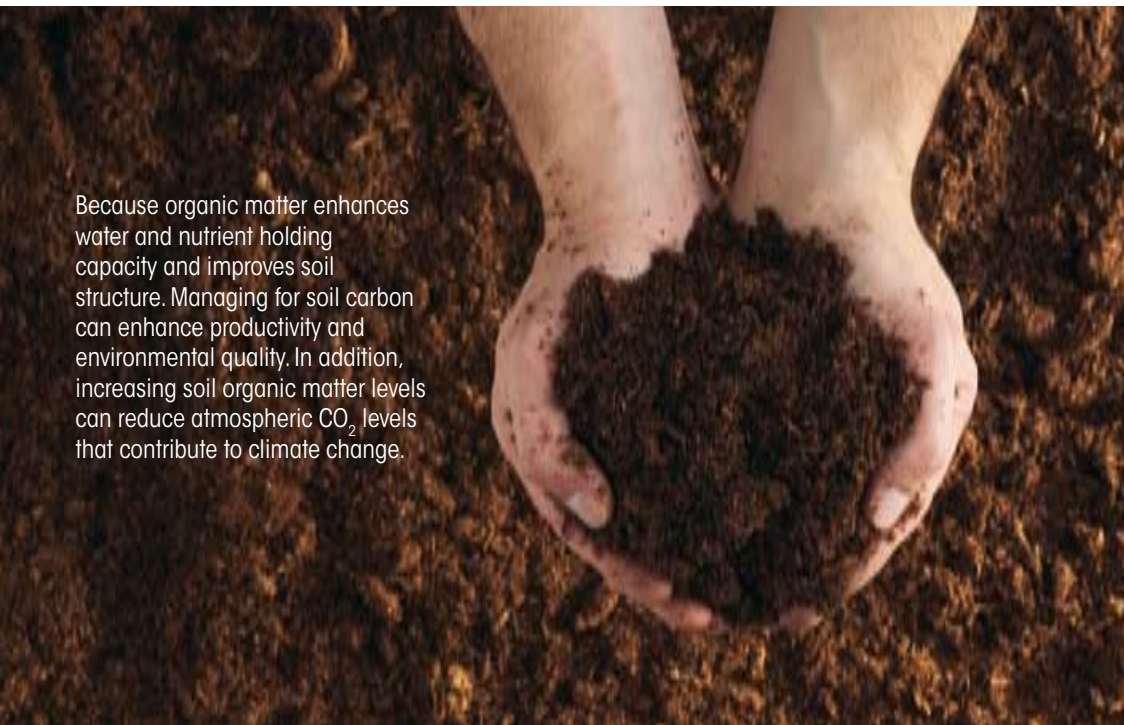
- Reduction in tractor's emissions equivalent at 147.58 Kg of CO₂ per ha per year, due to the reduction of tilling needs

Decrease the loss of organic matter

- avoiding to release the equivalent to 1380.00 kg of CO₂ per ha per year, due to the reduction of the organic matter decomposition related to no-tillage techniques

Quote Lal R.2004 SCIENCE 304,1623-1627

Quote Smith P.2004 European Journal of Agronomy 20,229-236



Because organic matter enhances water and nutrient holding capacity and improves soil structure. Managing for soil carbon can enhance productivity and environmental quality. In addition, increasing soil organic matter levels can reduce atmospheric CO₂ levels that contribute to climate change.

Tonutti Group And the new under-surface seeding technique

- **Non inversion of soil layers: decrease in tillage**
- **Preserve and improve soil organic matter, its fertility and biological activities**
- **Preserve soil moisture: improve water circulation and retention in the soil**
- **Reduces the energy consumption of farming operations and increases energy productivity output**
- **Machineries that are quick, practical with simple concepts and which guarantee durability and minimum maintenance**
- **Every solutions proposed are developed toward efficiency, profitability and sustainability into today's cropping systems**

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Tonutti Group
committed to give them a FUTURE



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