



Inflorescence of male flowers



Ragweed infestation in a sunflower field

Measuring the effectiveness of the fight against ragweed: feasibility study

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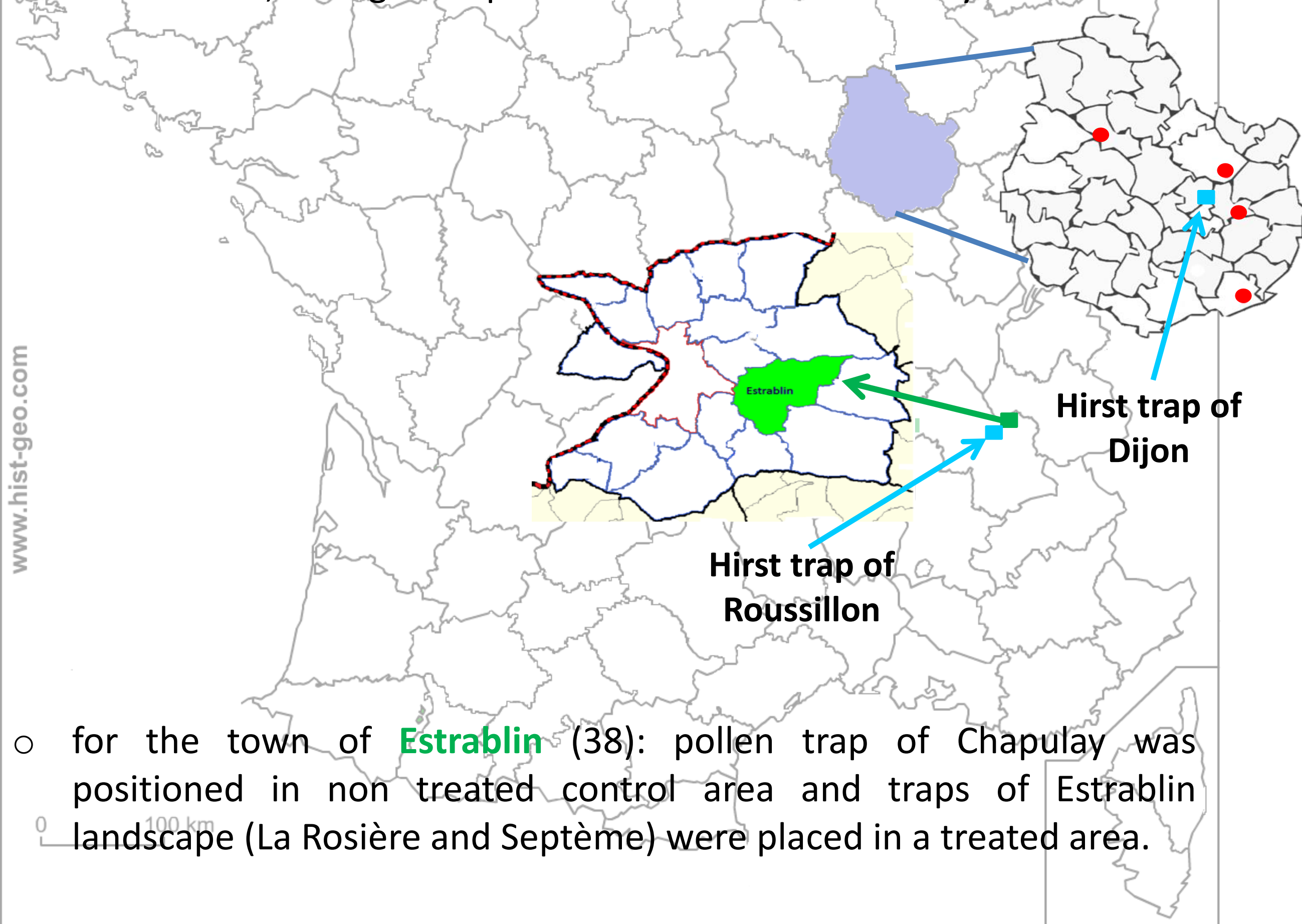
Common ragweed (*Ambrosia artemisiifolia* L.), known for its allergenic pollen, is an invasive plant which is very difficult to control because of real adaptation ability to control practices.

Among the difficulties, the lack of indicators of success or of improvement of the situation contributes to the discouragement of managers. The aim of this work is to try to establish, from the measurement of the amount of pollen in the air, some indicators of improvement of the situation in a given area. This first experiment aims to test the validity of the Sigma2-like traps, compared with pollen data base obtained with Hirst type pollen traps.

2 areas of study, 4 Sigma2-like traps by area

○ Côte d'Or department (21), colonization front of the plant. Sigma2-like traps are implanted on 4 towns:

- for 3 of this town, ragweed plants have been listed: Spoy, Pagny la Ville et Tart l'Abbaye
- for 1 town, no ragweed plant has been listed: Etormay



○ for the town of Estrablin (38): pollen trap of Chapulay was positioned in non treated control area and traps of Estrablin landscape (La Rosière and Septème) were placed in a treated area.

Materials et methods:

○ *Sigma2-like traps (SLT): passive pollen trap*

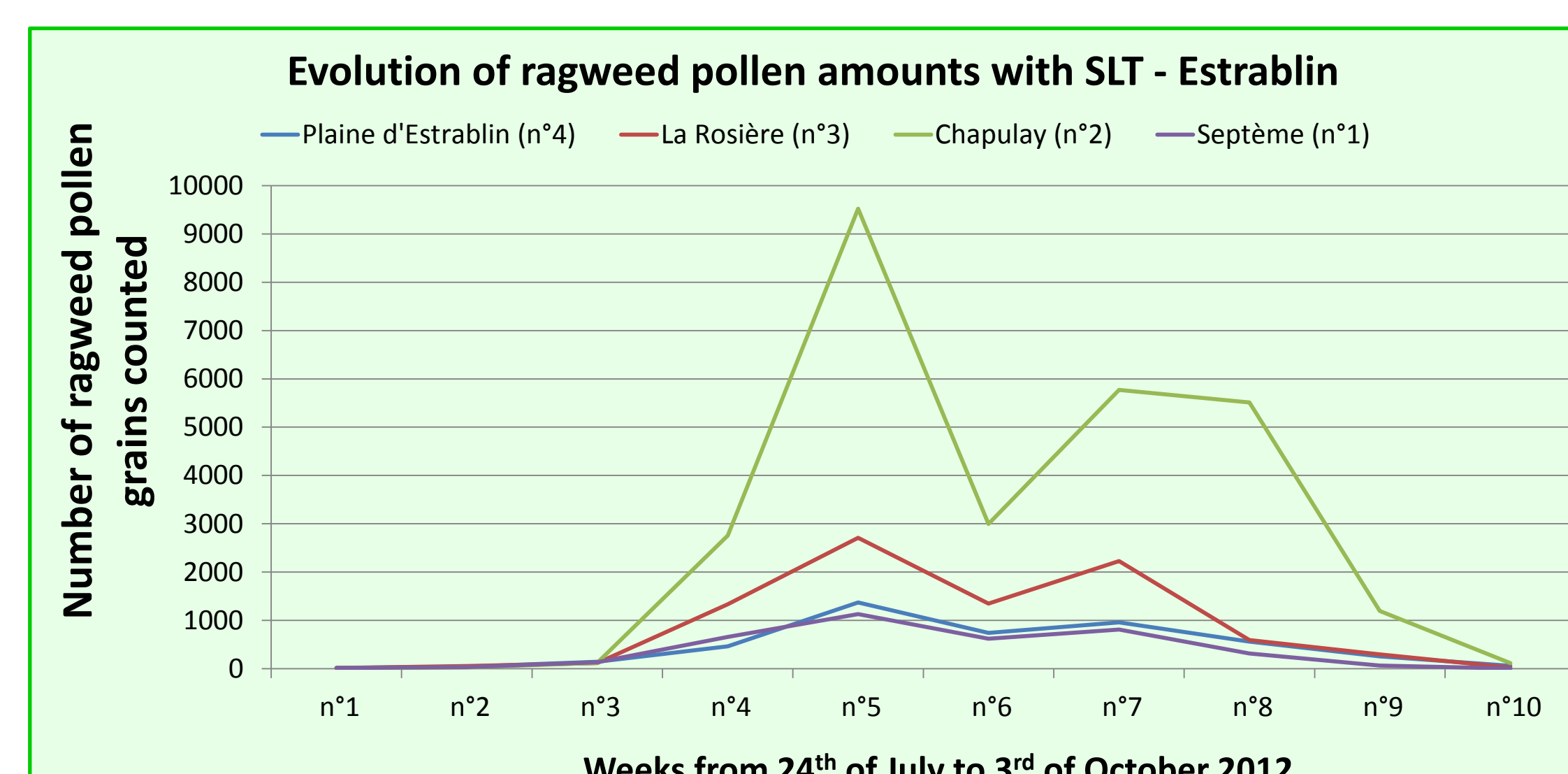
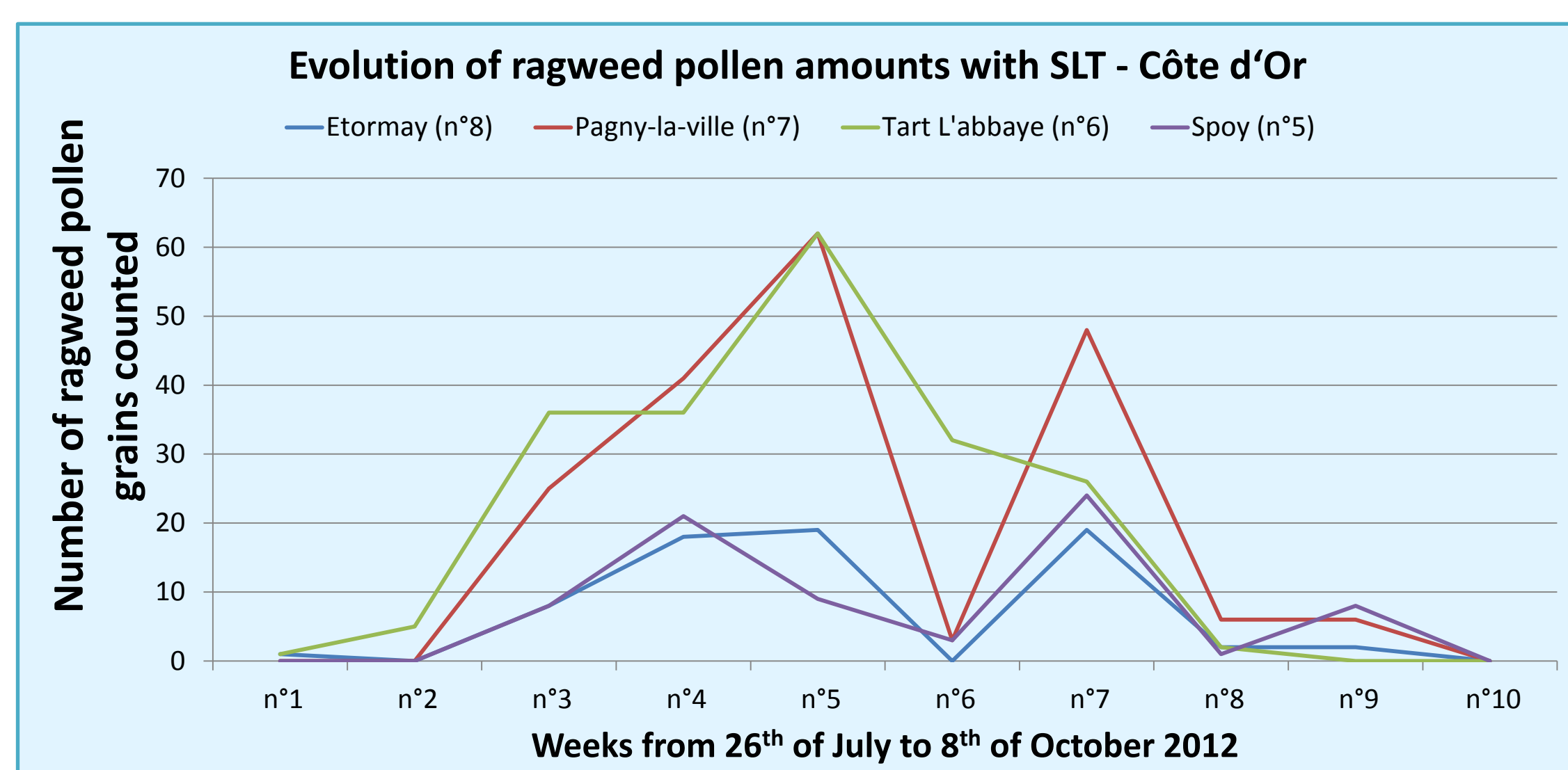


- SLT is composed on one hand of a transfer zone of air flow (high part) and one the other hand of a reception zone of particles by sedimentation (low part). Air flow goes through the trap in central zone, particles sediment and come on a coated slide disposed in the lower part of the trap
- The slides are changed every week
- 10 weeks of sampling
- Then the slides are analysed with an optical microscope to obtain ragweed and total pollen counts (number of pollen grains by unit of time).

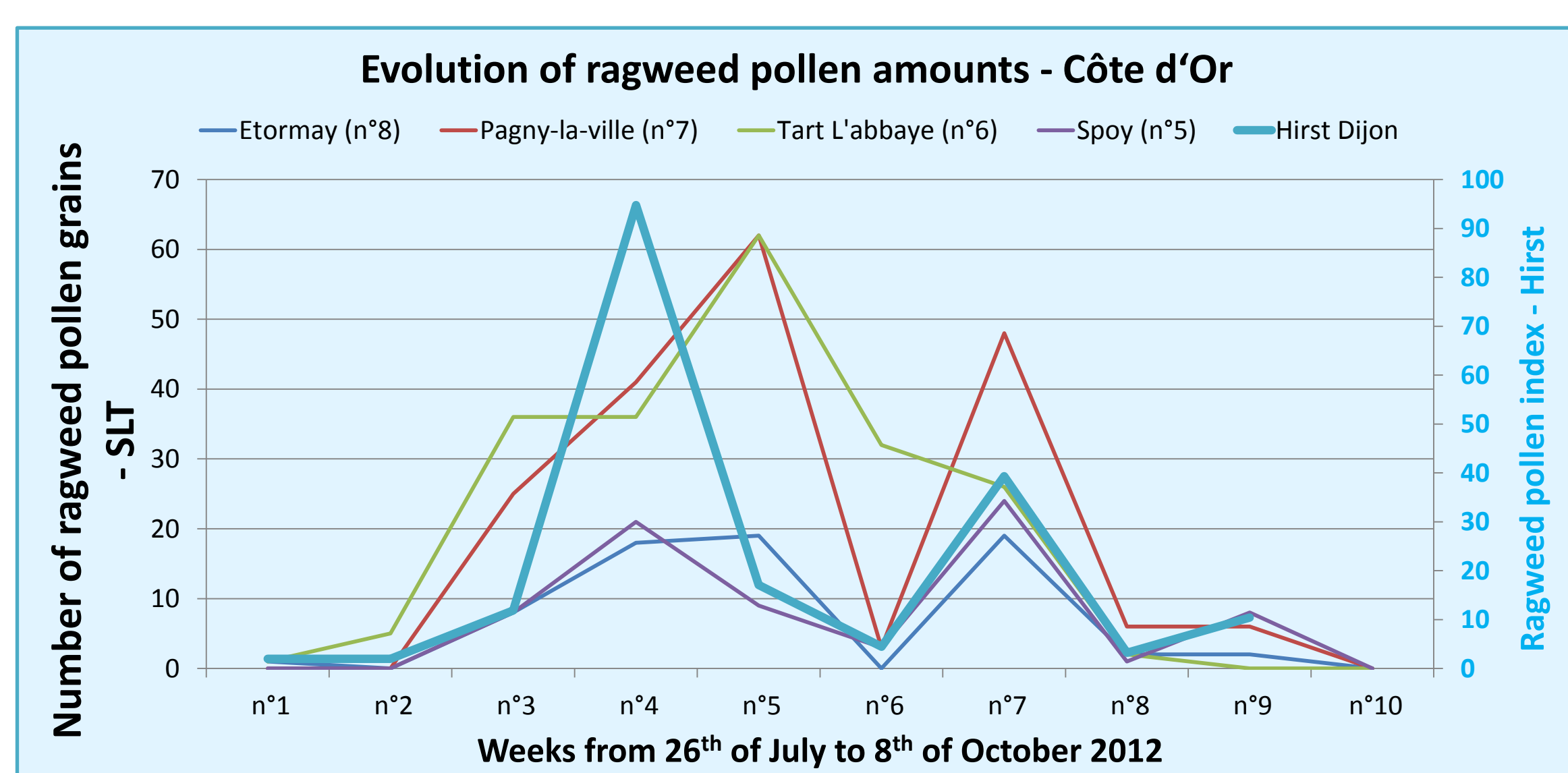
○ *Hirst pollen trap: volumetric spore traps with continuous aspiration*



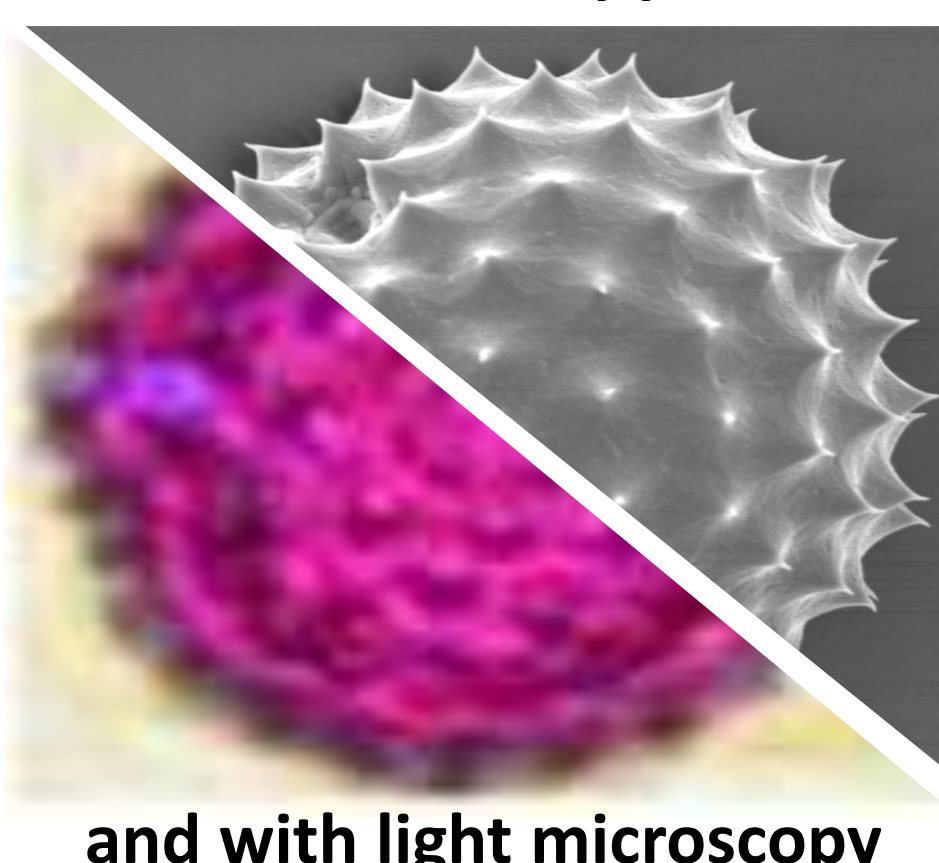
- The ambient air is sucked with a flow rate of 10l/min. Particules are deposited by impaction on coated tape moving in front of the orifice of the trap (2mm/hour) in a continuous way.
- The tape is cut into 24h sections and prepared for microscopical observation.
- The sampling surface is examined by optical microscopy with a x400 magnification, by using criteria of the determination key of pollens established by the RNSA, and provide qualitative and quantitative data (grains per m³ of air by time unit).



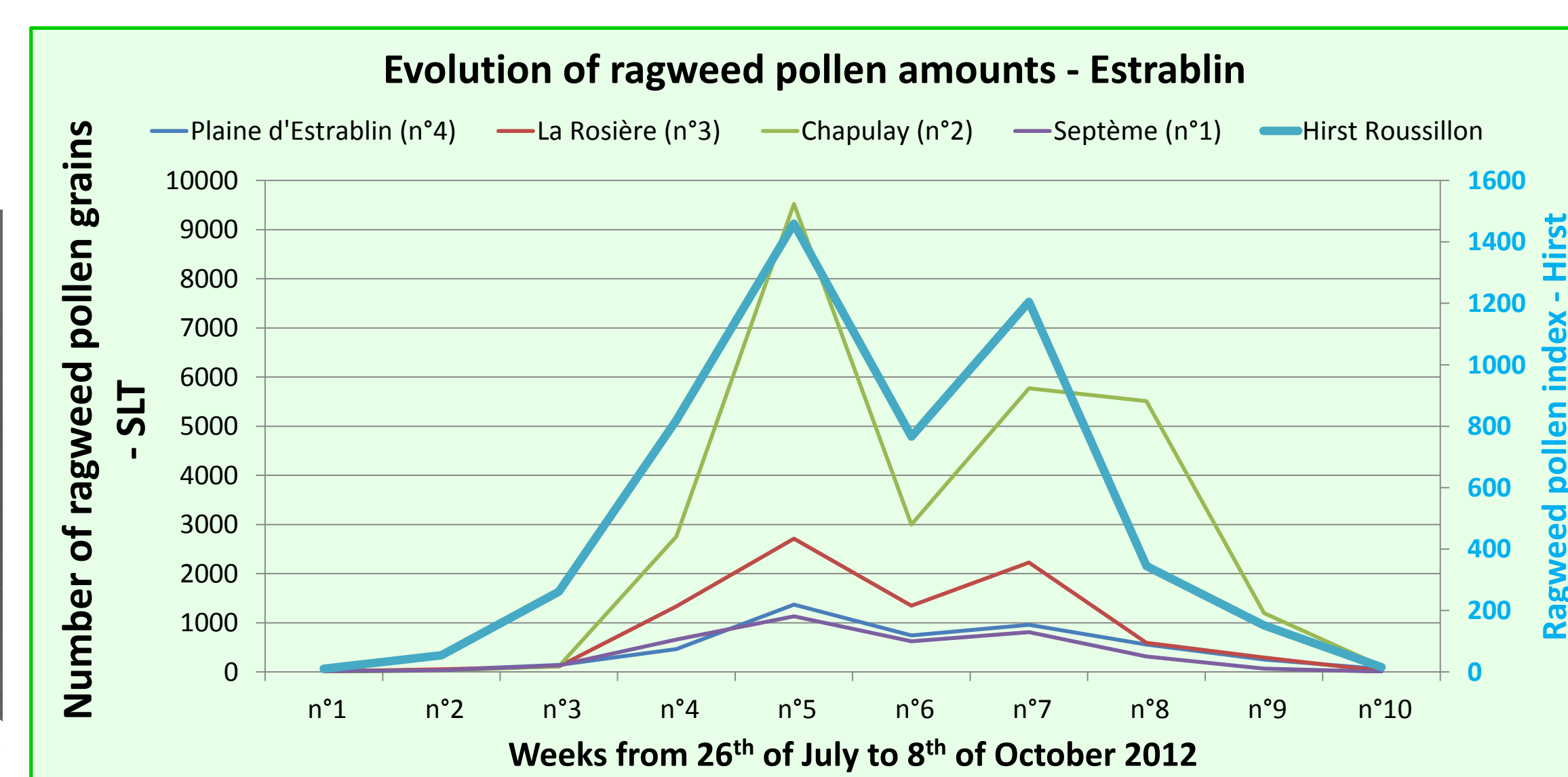
The different graphics show the temporal coincidence between SLT and with the Hirst traps both in the border area of colonization and in the area of infestation. In Côte d'Or, amounts of ragweed pollens are lower in Etormay and Spoy, but the results stay in the same range of pollen (some tens of grains on the whole traps). On the graphic of infested area, pollens quantities are in hundreds or thousands of grains. SLT trap of Chapulay, placed in a non-treated area, shows quantities significantly higher than the other SLT (in treated area) but also than the Hirst trap of Roussillon.



Ragweed pollen with scanning electron microscopy



and with light microscopy



- ➔ In the 2012 experimental conditions, SLT allow to measure variations of pollen quantities between areas and inside the zones of study. SLT seems meet objectives
- ➔ Pollen quantities got in Isère are 100 times higher than the ones got in Côte d'Or. The dynamics of pollen production is comparable in the two zones
- ➔ In Côte d'Or, pollen quantities is three times higher in two of the cities where ragweed has been identified. For the « control city », pollen identification show an exogenous origin
- ➔ In Estrablin, quantities are very high (more than 1000 pollen grains by week). But there are less pollens in the treated zone than in the close untreated zone

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