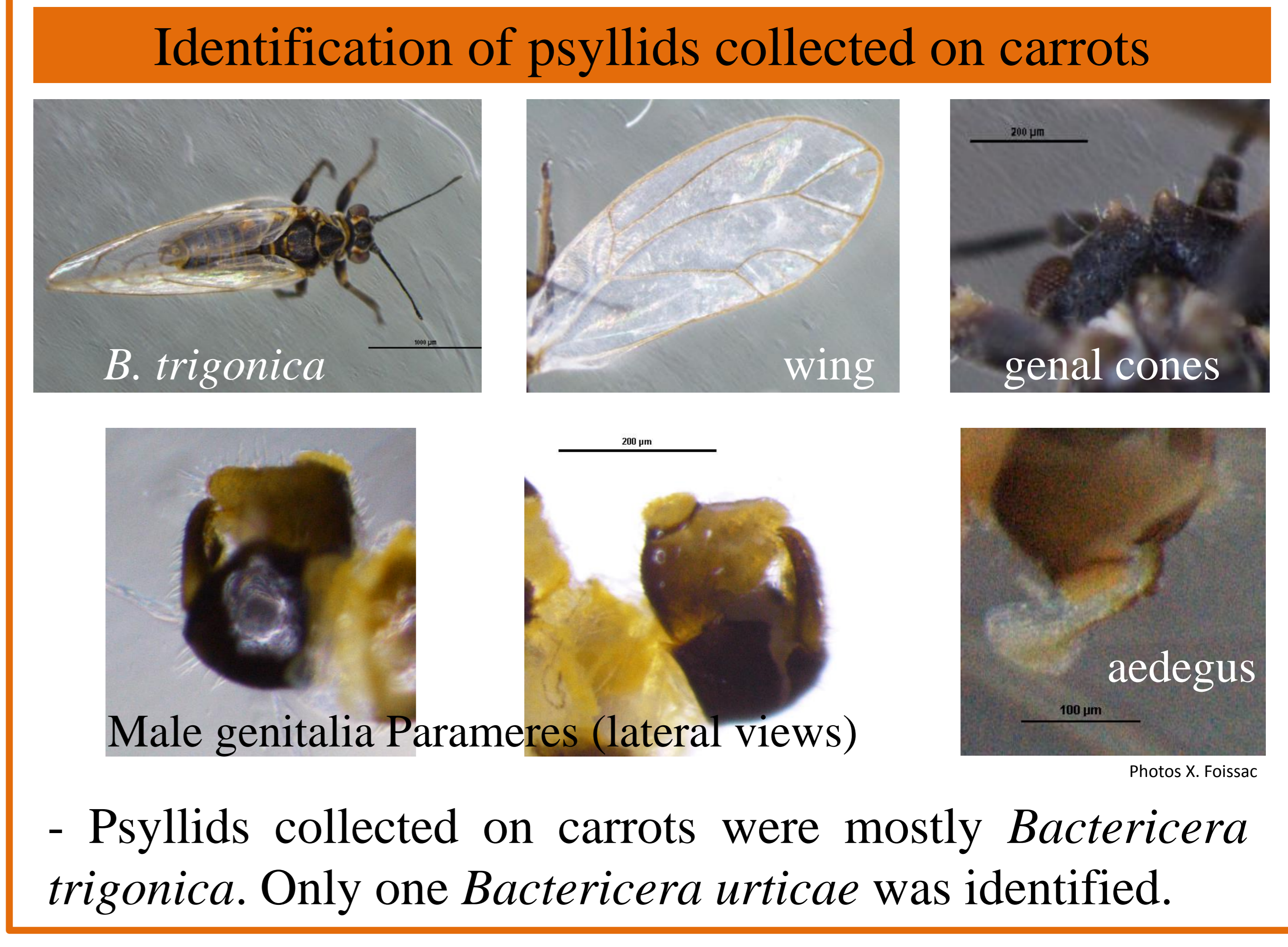
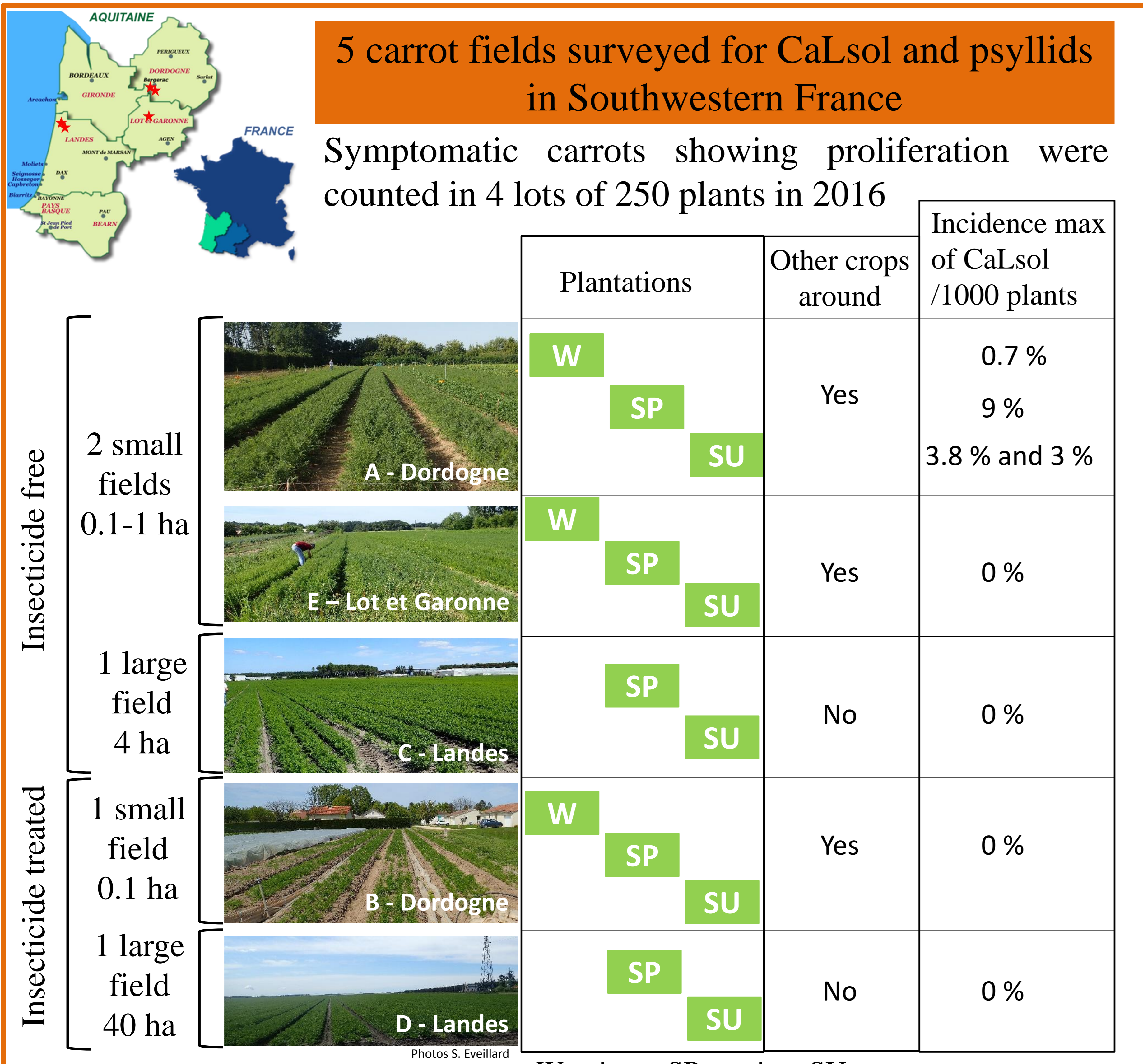


Genetic characterization of *Candidatus Liberibacter solanacearum* strains infecting carrot psyllids in Southwestern France

Bernard BERGEY, Sandrine EVEILLARD, Xavier FOISSAC

UMR 1332 Fruit Biology and Pathology, INRA, University of Bordeaux, CS20032, 33882 Villenave d'Ornon cedex, France

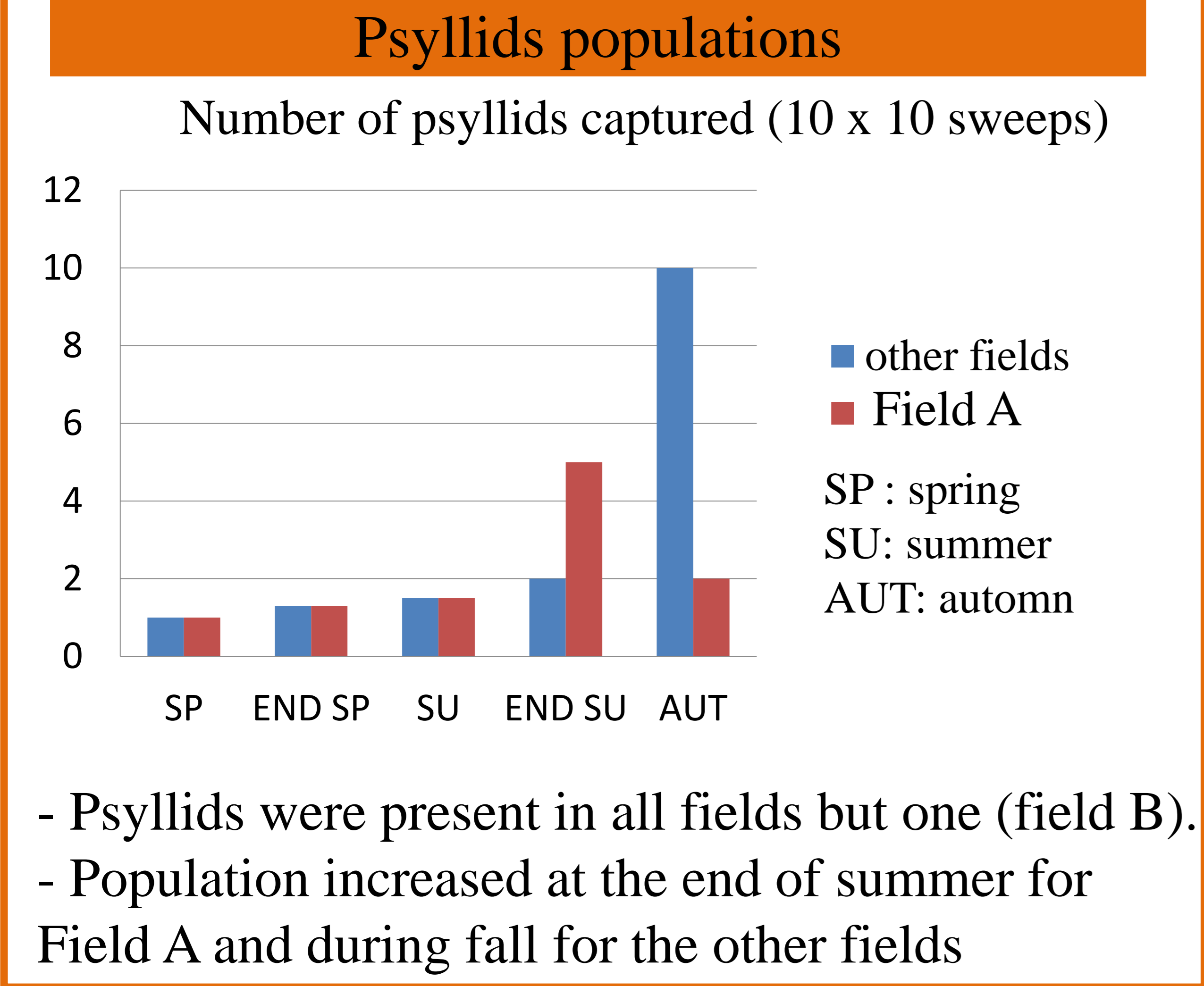
The phloem-limited bacterium, *Candidatus Liberibacter solanacearum* (CaLsol), is responsible of several diseases on Solanaceae (USA, New-Zealand) and on Apiaceae such as carrots in several European countries (Spain, France, Finland, Sweden, Germany). This bacterium is vectored by psyllids, *Bactericera cockerelli* to potatoes, or *B. trigonica* and *Trioza apicalis* to carrots. Different haplotypes of the bacterium were identified, based on the 16S rDNA and the ITS sequences: A and B on the american continent, C, D and E in Europe. In France, since the 1970s, proliferation of carrots was shown to be associated with this psyllid-transmitted, phloem-limited bacterium. In order to reassess disease impact and better characterize the bacterium involved, five organic or non-organic carrot fields were surveyed in 2016 for CaLsol and psyllids in three production areas of Southwestern France.



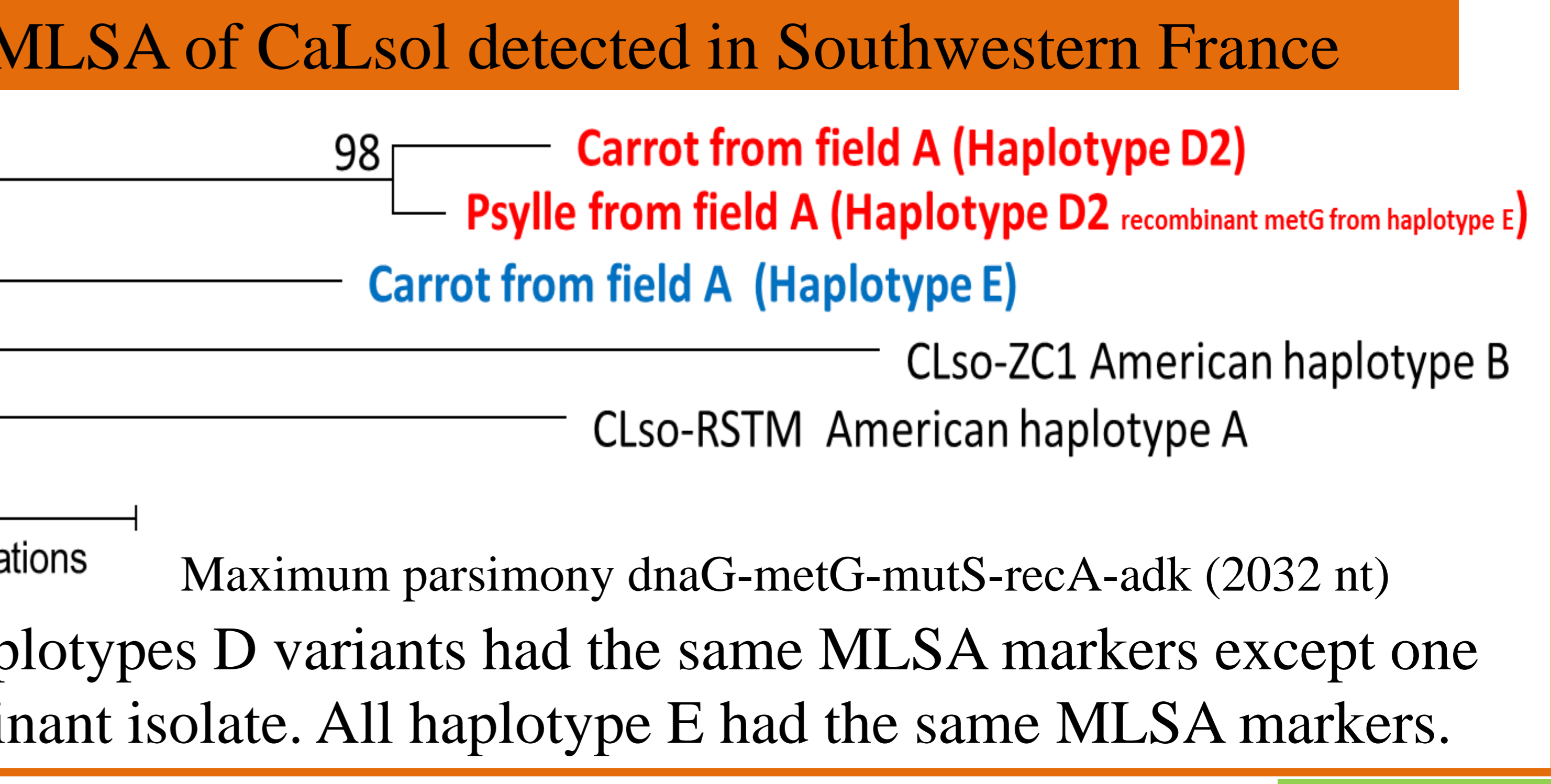
CaLsol detection in psyllid populations

Region	Fields	Insecticide treated (T) or not (NT)	Date of seedling	nb psyllids positive for CaLsol / total tested			
				May	July	August	September
Dordogne	A	NT	2015-11	6/39		1/10	
			2016-02			1/14	
			2016-06				
Landes	C	NT	early spring 2016			0/6	
			summer 2016				3/24
	D	T	early 2016		4/7		
Lot-et-Garonne	E	NT	2015		0/27		
			early 2016			2/11	
			early 2016				3/25

- Symptomatic carrots were identified only in one field (A).
 - Incidence of CaLsol is very low but increased up to 9% in field A.



- CaLsol detection in psyllids was globally of 12% and ranged from 0% to 57% per sampling (rt-PCR detection, Teresani et al. 2014)
- Three haplotypes (16S rDNA and ITS) were identified: two variants of D, named D2 and D3, and E.
- Haplotype D2 differs from D by 2 SNPs in 16S and ITS, and D3 is identical to D for 16S and to D2 for ITS.
- D2 and E were found in carrots; D2, D3 and E in psyllids.



Conclusions

- Psyllid populations were found in carrot fields in Southwestern France, mostly *B. trigonica*. Some were infected with CaLsol.
- The capacity of *B. trigonica* to transmit CaLsol from carrot to other crops remain to be established.