visable, in fact, to maintain the filtered materials, and the first passages in culture obtained from them, at temperatures lower than 30 °C, during the isolation. It is also interesting to remark that serum anti Doberdò 1, absorbed with the homologous strain, is still able to agglutinate the strains Friuli 8 and 35.

Table III

Serogroup	Serotypes	Strains
Basovizza	San Giusto	Friuli 8
Basovizza	San Giusto	Friuli 35
Maritza	Valderio	Friuli 37
Orvenco	Orvenco	Friuli 44
Udine	Udine	Friuli 48

Résumé. 5 souches de léptospires saprophytes ont été isolées et classifiées, avec l'identification de 3 nouveaux sérotypes (Orvenco, Udine, Valderio) et de 2 nouveaux sérogroupes (Orvenco, Udine). Une des souches isolées fut incapable de se développer à la temperature de 20 °C ou au dessus.

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Herbicidal Pollution. Pollen Damage by the Herbicide Vapours

The herbicides, because of their specific weed killing activities, have become assets but they may prove harmful also. The lethal effects of herbicides to the pollen grains have not been investigated. While the field estimates are under investigation, a possible effect of 2,4-D on pollen grains of brinjals (*Solanum melongena* Willd.) has been described here.

Method. 75 ml of 2,4-D in concentrations of 100, 250, 500 and 1000 ppm was kept in beakers. The mouth of the beaker was covered by a muslin cloth and pollens were sprinkled on the cloth. The beakers were kept at room temperature (32 ± 1.6 °C) for 4 days. At the end of each day, pollens were taken from the muslin surface and were kept on the extracts of stigmatic surfaces (of brinjal flowers) so as to ensure germination. Average amount of herbicide solution evaporated per day from beakers was 13 ± 2.3 ml. Viability of pollen grains was expressed by its germination.

Results and discussion. The treated pollens appeared to be damaged by the herbicidal vapours. Up to a certain extent, even 100 and 250 ppm concentration had damaging effects which increased with time, while 500 and 1000 ppm of 2,4-D starts its effect right from the first day, of course with a further increase in the effect in later days. It was very clear that a treatment for 4 days with a higher dose of herbicide, i.e. 1000 ppm, can reduce the percentage of the viable pollens to 31%, a decrease of 56% with respect to the untreated ones. Results thus point (Table) to the possible pollen losses in fields after the herbicidal trials because of the subsequent evaporation of the herbicides. In fact the number of the pollens required for fertilization against the number of pollen grains produced is so small that we may not be able to feel a difference in the yields in the earlier stages. But a constant use of the herbicides will definitely increase the amount of herbicidal vapours in the air around the fields. This will certainly cause an air pollution, having definite impacts on pollen viability and the germination.

The study thus reveals the possible role of the herbicides in polluting the air. Among the various works (MIDDLETON[1], HILTON et al.[2], RICH[3], KING[4], MORELAND[5], HECK[6], STERN[7], DUGGER and TING[8]) described, this aspect was never covered.

Zusammenfassung. Herbiziddämpfe reduzieren die Pollenfertilität von *Solanum melongena* Willd.

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Effect of herbicidal vapours on viability of pollen grains

Conc. of 2,4-D (ppm)	Pollen grains germinated (%) (treatment in days)			
	1	2	3	4[a]
100	81 ± 2.6	76 ± 5.5	79 ± 2.8	73 ± 3.6
250	81 ± 2.6	76 ± 5.5	70 ± 6.5	64 ± 3.6
500	74 ± 3.4	66 ± 2	59 ± 3	51 ± 3
1000	74 ± 3.6	53 ± 1.7	44 ± 2	31 ± 4.3
Untreated	87 ± 4.3	87 ± 4.3	88 ± 4.3	87 ± 4.3

[a] Fertility significant at 5% level.

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