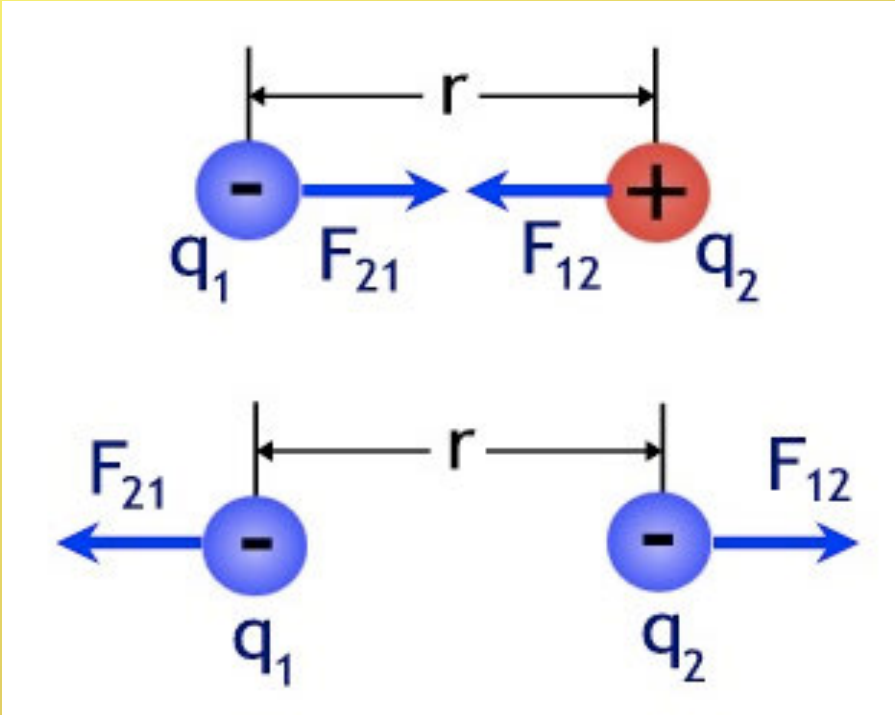
ELECTROSTATIC CHARGE

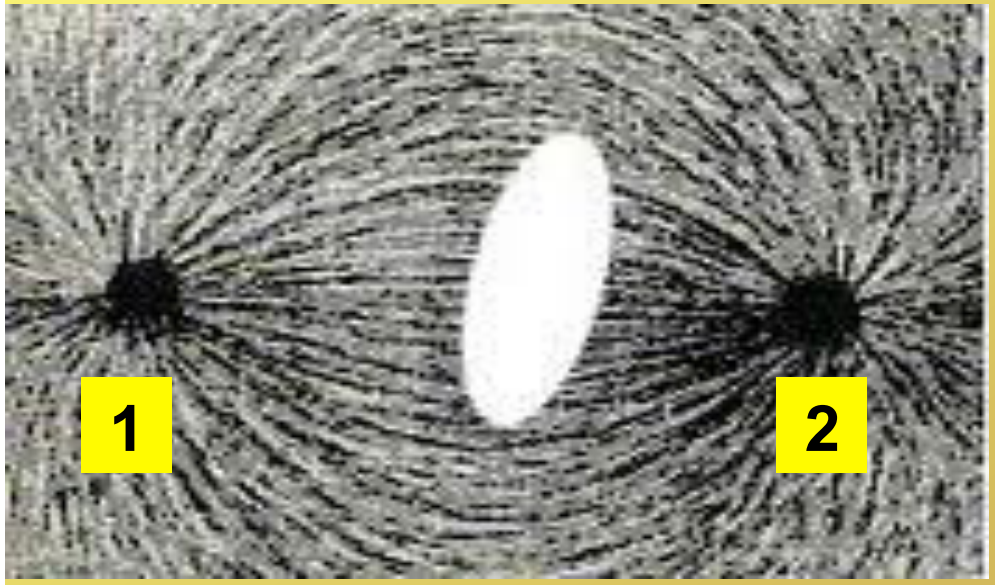
(E±S+)



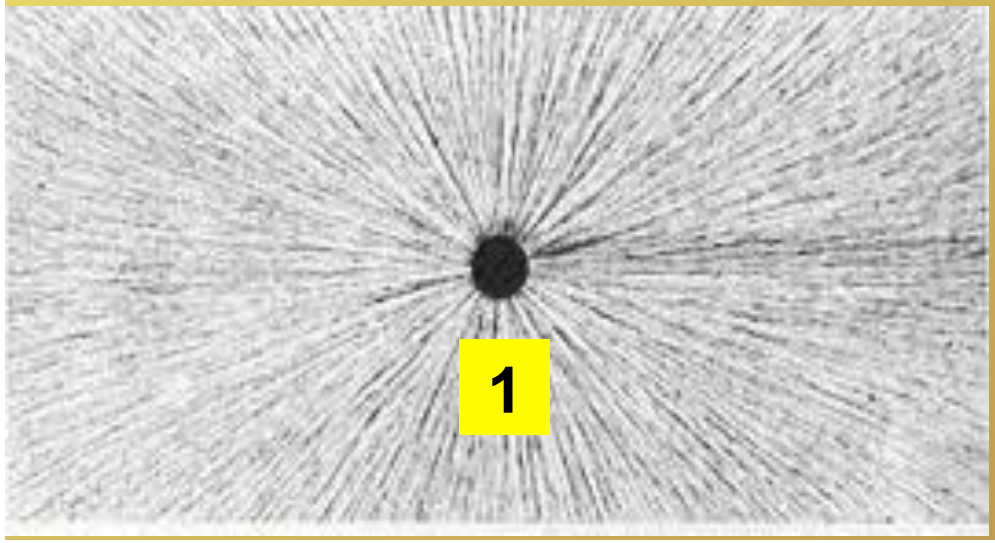
Electric Charge is a physical property of matter that causes a force when near other electrically charged matter. There exist two types of electric charges: Positive and Negative.

Positively-charged matter is repelled from other positively-charged matter, but attracted to negatively-charged matter. Negatively-charged matter is repelled from negative and attracted to positive.

The more the number of electrical charges the more the intensity of the electrical field.



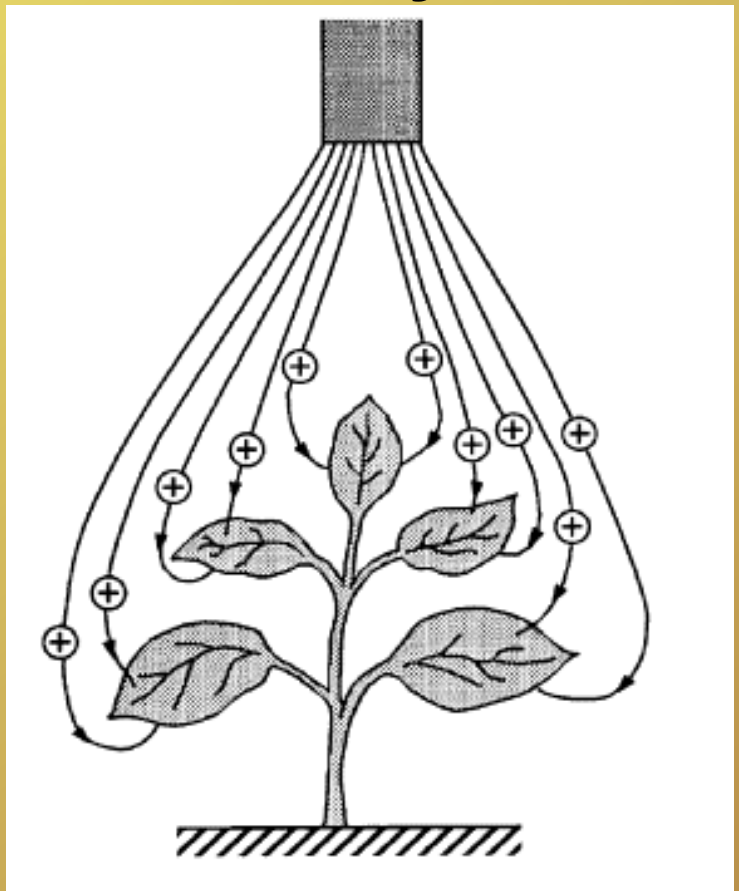
Electrical Field generated by Two Electrical Charges



Electrical Field generated by One Electrical Charge.

ELECTROSTATIC CHARGE IN AGRICULTURE

A charged cloud of droplets is sprayed towards a grounded object driven by Electrostatic force.



APPLE SPRAYING With AND Without ELECTROSTATIC CHARGE.

The apple sprayed **with** Electrostatic Charge is uniformly covered, whereas the apple sprayed **without** Electro-Static Charge is not covered in the back.

Apple Front

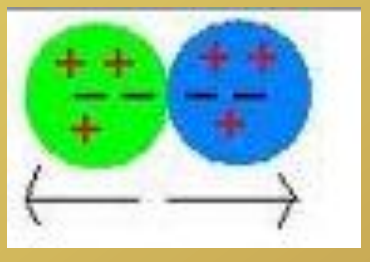
Apple Back

ADVANTAGES

Of the Electrostatic Charge

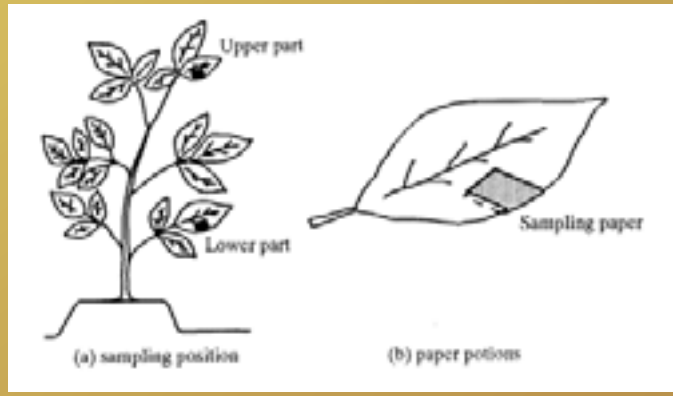
1. Increased spraying efficiency.

The electrical charged droplets repel each other and move apart: this results in a very uniform cloud of droplets.



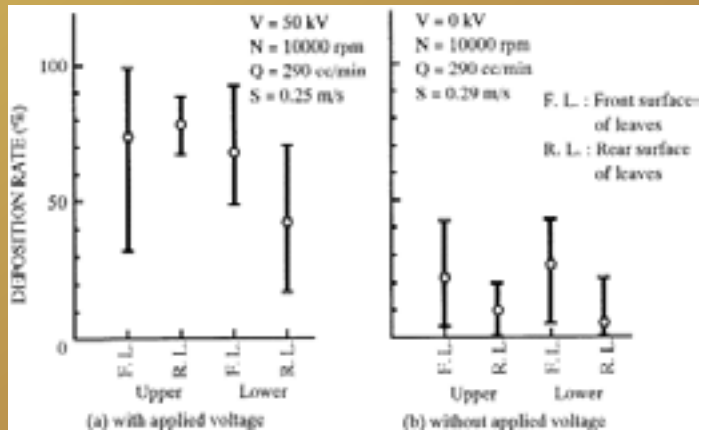
2. Increased pesticide deposition on plant targets.

The force due to the electric field overwhelms gravity and keeps droplets floating in the air, so that they can reach the underside of the leaf, where many pests live as well.



3. Reduced drift.

The mutual attraction between charged droplets and leaves (which are ground connected), reduces the drift.



EXAMPLES

Depositional studies of a charged spray application in an orchard G. N. Laryea, S. C. Kim and S. Y. No
Dept. of Agricultural Machinery Engineering Chungbuk National University, Cheongju, 361-763, Korea.

The field experiment was conducted in a semi-dwarf apple orchard of two different varieties, East Malling Roots (M9 and M26) at Taegu, Korea. With the M9 trees, the distance between rows was 3.2 m; the tree spacing within rows was 1.2 m and average height of about 3.2 m. In the case of M26, the row of trees in this block was 4.8 m and tree spacing was 3m with average height of 3.5 m.

Table 2. Mean tracer deposits from the orchard sprayer operated for M9 trees (ppm)

Fan speed (rpm)	Tree level	One pass Spray treatment Uncharged	One pass Spray treatment Charged	Ratio* C / U	Two passes Spray treatment Uncharged	Two passes Spray treatment Charged	Ratio C / U
2000	Top	1445 (a)	2484 (a)	1.72	1708 (a)	3023 (b)	1.77
	Middle	1455 (a)	3674 (b)	2.53	2207 (a)	4476 (b)	2.03
	Bottom	1861 (a)	4318 (b)	2.32	1740 (a)	4192 (b)	2.40

* C – Charged spray: U – Uncharged spray

** Means within row separated by both the DMRT and the Tukey methods of comparisons, common letter are not significantly different at the 5% level

EXAMPLES

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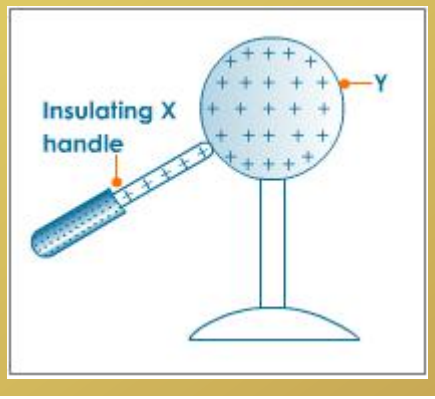
Table 3. Mean tracer deposits from the orchard sprayer operated for M26 trees (ppm)

Fan speed (rpm)	Tree level	One pass Spray treatment Uncharged	One pass Spray treatment Charged	Ratio* C / U	Two passes Spray treatment Uncharged	Two passes Spray treatment Charged	Ratio C / U
2000	Top	784 (a)	1965 (b)	2.51	1404 (a)	2593 (a)	1.85
	Middle	1306 (a)	1343 (a)	1.03	1439 (a)	4016 (b)	2.79
	Bottom	825 (a)	1498 (a)	1.82	2106 (a)	2729 (a)	1.30

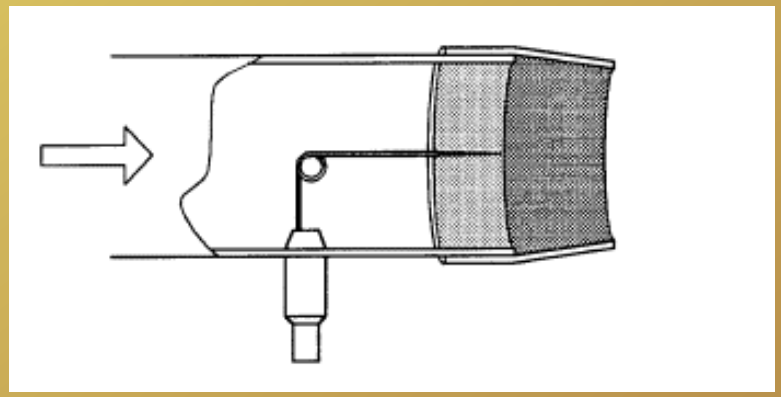
* C – Charged spray: U – Uncharged spray
** Means within row separated by both the DMRT and the Tukey methods of comparisons, common letter are not significantly different at the 5% level

CHARGING METHODS

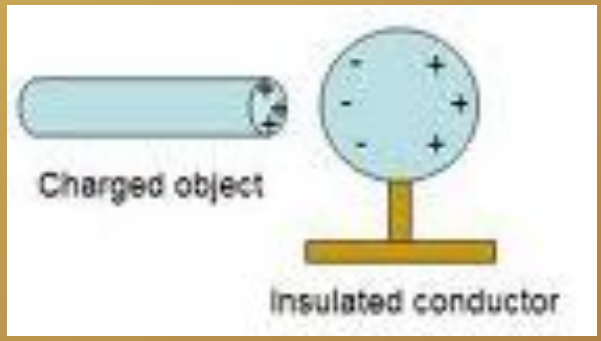
- **Conduction Charging.**



- **Corona Charging.**



- **Induction Charging.**

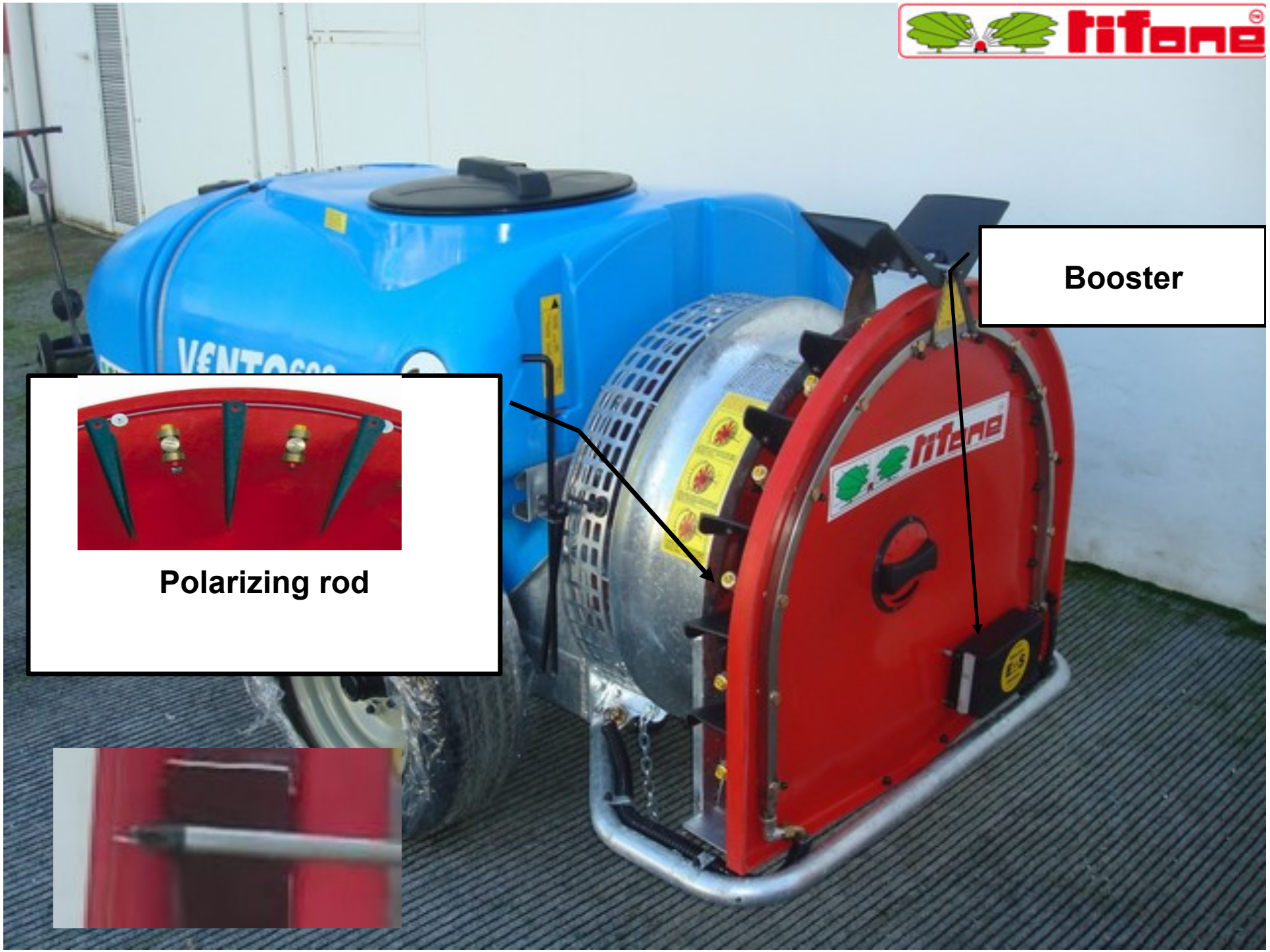


WHY INDUCTION CHARGING ?

- **The Liquid is not in direct contact with High Voltage**.
- **The Current capacity can be very small**, as theoretically there is no current from the power supply.
- **Electrode Insulation is easier,** as the electric field strength is below the breakdown strength of the air.

TIFONE ELECTROSTATIC CHARGE (E±S+)

Tifone Electrostatic Charge (E±S+) for Fan, utilizes a integral polarization rod, extended for the whole spray outlet perimeter (integral polarization), instead of the usual ring shaped polarisers, placed around any single nozzle.


Booster
Polarizing rod

COMPONENTS of TIFONE ELECTROSTATIC CHARGE (E±S+) TIFONE

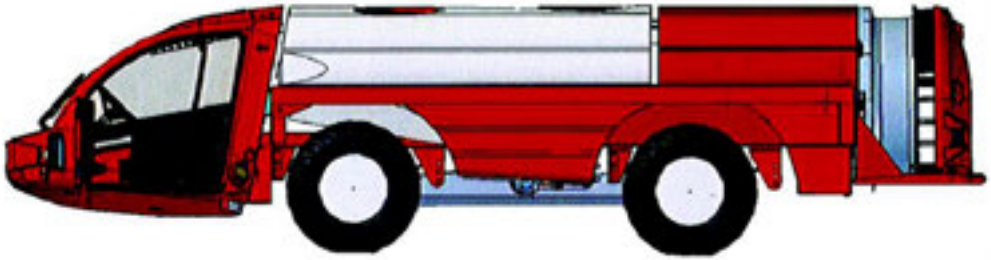
Booster

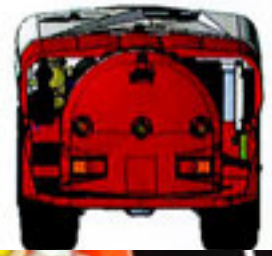
Polarizing rod

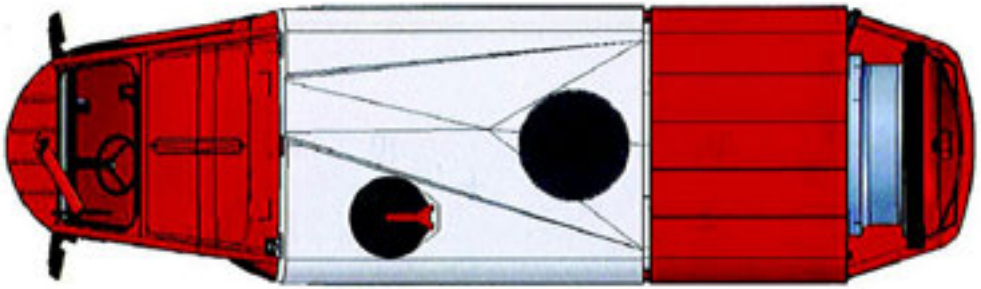
VECTOR 1000 WITH 32” TOWER WITH TIFONE ELECTROSTATIC CHARGE (E±S+)

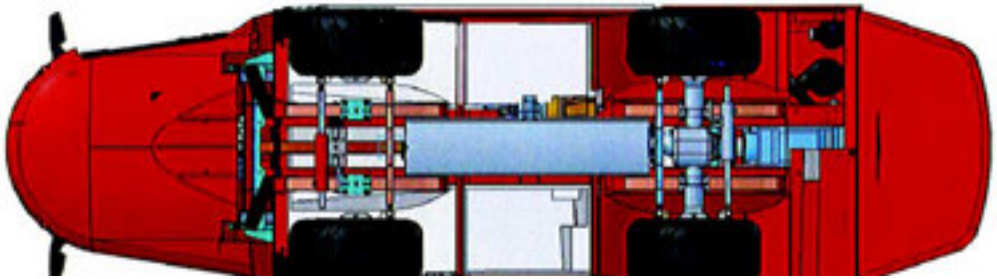
VECTOR 1000 with Turbofan 32” AA and TIFONE ELECTROSTATIC CHARGE (E±S+)

COBRA INTERCEPTOR with 36” AA FAN
TIFONE ELECTROSTATIC CHARGE (E±S+)

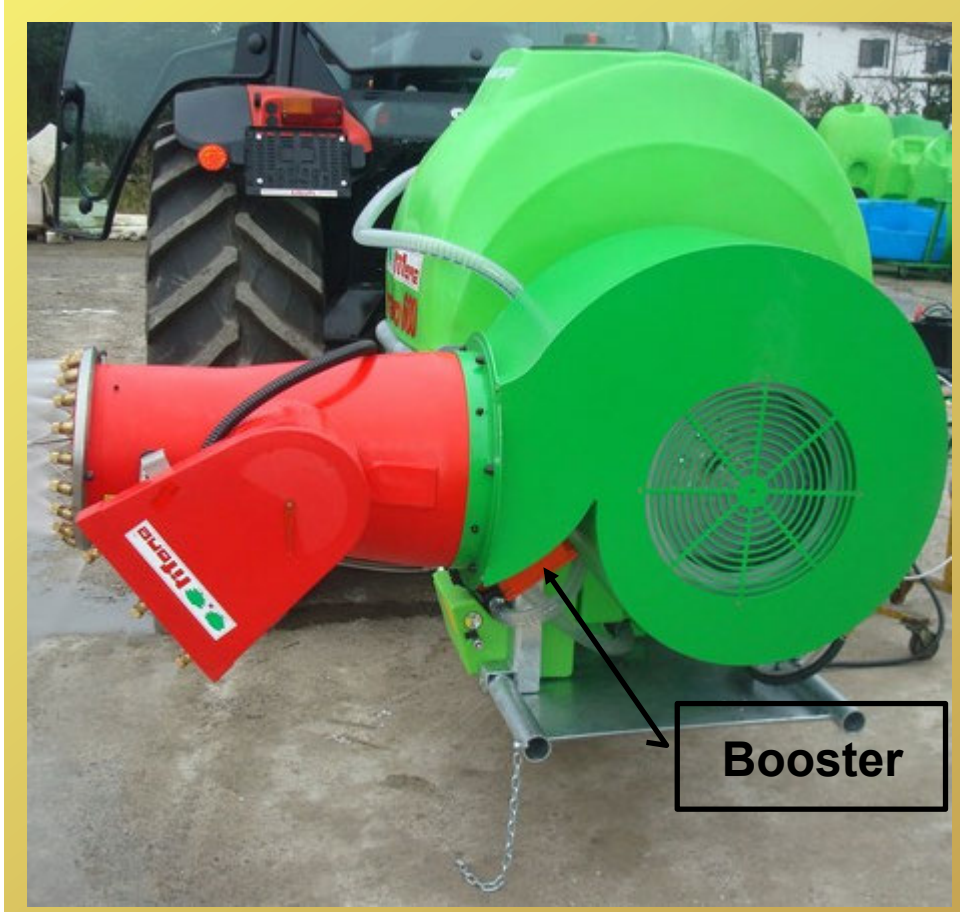








ELECTROSTATIC CHARGE (E±S+) TIFONE for CANNON



BRAVO 600 with CANNON 65s
TIFONE ELECTROSTATIC CHARGE (E±S+)

BRAVO 600 with CANNON FLEXIGUN 65s
TIFONE ELECTROSTATIC CHARGE (E±S+)