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Equipment for crop protection — Vocabulary

Matériel de traitement phytopharmaceutique — Vocabulaire
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Foreword

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This second edition cancels and replaces the first. edition (1992), that has been technically revised.

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Equipment for crop protection — Vocabulary

1 Scope

This International Standard defines terms used in relation to equipment for applying plant protection products for crop protection.

2 General terms

2.1
plant protection product
product or preparation used to protect or improve the growing, harvesting and storing of crops/plants

2.2
plant protection product container
collective name for plant protection product packaging such as cans, bottles, bags, sacks or boxes

2.3
formulated product
plant protection product as purchased by users

2.4
ready-to-use (RTU) formulated product
formulated product that does not require dilution e.g. ULV formulations

2.5
active ingredient
substance with primary biological activity against specified pests

2.6
carrier
diluent
substance used to dilute the active ingredient to aid in metering and delivery

2.7
treatment
operation of applying plant protection products to produce a biological effect

2.8
overall treatment
treatment carried out over the entire area of a crop or field

2.9
localised treatment
treatment carried out over part of a crop or field, generally in bands, rows or spots

2.10
treated area
sprayed area
area to which the treatment is intended

2.11
spray target
specific pest or surface to which the treatment is intended

2.12
liquid flow
liquid flow rate
volume of liquid flowing through an appliance or device per unit of time

2.13
liquid output
volume of liquid discharged by an appliance or device per unit of time

2.14
air flow
air flow rate
volume of air flowing through an appliance or device per unit of time

2.15
air output
volume of air discharged by an appliance or device per unit of time

3 Equipment for spraying

3.1 Basic definitions

3.1.1
spraying
division and emission into the air of a spray liquid by atomisation into the form of droplets

3.1.2
spray
droplets produced by a nozzle/atomiser

3.1.3
sprayer
spray system
appliance for spraying of plant protection products

3.1.4
spray liquid
spray mixture
liquid containing the formulated product ready for spraying

3.1.5
droplet
substantially spherical liquid particle, generally with a diameter less than 1 000 µm

3.1.6
droplet size
diameter of the droplet in µm

3.1.7
droplet size spectrum
cumulative distribution of droplet sizes by volume or number

3.1.8
volume median diameter (vmd)
$D_{v0,5}$
droplet size where half the volume of the spray is in larger droplet sizes and half in smaller droplet sizes

3.1.9
number median diameter (nmd)
$D_{n0,5}$
droplet size where half the number of droplets in a spray are in larger droplet sizes and half in smaller droplet sizes

Note 1 to entry: the vmd: nmd ratio is used to characterise the uniformity of droplet sizes in a spray

3.1.10
span
measure of range of droplet sizes in a spray

Note 1 to entry: span is expressed as $\frac{D_{v0,9}-D_{v0,1}}{D_{v0,5}}$

3.1.11
droplet volume fraction
$D_{v0,x}$
droplet diameter where the fraction x the spray volume is in smaller droplet sizes

3.1.12
Sauter mean diameter
mean droplet size in a spray by spray volume/surface area

3.1.13
mist
spray with volume median diameter between 50 µm and 100 µm

3.1.14
fog
aerosol
spray with volume median diameter under 50 µm where the droplets are effectively suspended in air with little or no settling by gravity

3.1.15
controlled droplet application (cda)
spray with a narrow droplet size range, designed for a specific target defined by limits of vmd:nmd ratio or span

3.1.16
flat spray
spray with a flat shape

3.1.17
flat fan spray
spray with a thin flat shape

3.1.18
conical spray
spray with a conical shape

3.1.19
solid stream spray
spray with a cylindrical shape

3.1.20
sprayer liquid delivery system
system for delivery of spray liquid from the spray tank to the nozzle/atomiser

3.1.21
sprayer set up
combination of nozzle and boom parameters and sprayer adjustment on a specific sprayer model

3.1.22
spray quality
classification of droplet size spectrum against a reference

3.2 Types of spraying

3.2.1
hydraulic energy spraying
hydraulic pressure spraying
spraying obtained by using only the hydraulic energy of the spray liquid

3.2.2
centrifugal spraying
spraying obtained by the use of centrifugal force imparted to the spray liquid, generally by mechanical rotational energy from a spinning disc, cup or gauze

3.2.3
pneumatic spraying
spraying obtained by the action of a high velocity air stream on the spray liquid,generally after the nozzle outlet and using a distributor/plate

3.2.4
air-assisted spraying
spraying in which the droplets are carried wholly or partly by a flow of artificially created air

3.2.5
electrostatic spraying
spraying obtained by the use of electrostatic forces or where electrostatic forces are used to aid spray deposition

3.2.6
ultra-sonic spraying
spraying obtained either partly or wholly by (ultra-) sonic energy

3.2.7
thermal spraying
spraying obtained either partly or wholly by thermal energy

3.2.8
twin fluid spraying
spraying obtained by the action of an air stream mixed with the spray liquid before the nozzle outlet

3.2.9
underleaf spraying
spraying where the spray target is the underside of the leaves

3.2.10
spray dose
quantity of plant protection product applied

3.2.11
spray volume
quantity of spray liquid applied

3.2.12
spray deposition
quantity of spray that is deposited

3.3 Droplet generators

3.3.1
nozzle
atomiser
device to form droplets from a spray liquid

3.3.2
hydraulic energy nozzle
part or an assembly of parts with an orifice through which the spray liquid is forced under hydraulic pressure to provide the energy to obtain a spray at the nozzle tip

3.3.3
fan nozzle
hydraulic energy nozzle with an opening in the shape of a slit or elliptical orifice, producing a flat sheet of spray at the nozzle tip

3.3.4
flat fan nozzle
fan nozzle producing a planar spray

3.3.5
double flat fan nozzle
flat fan nozzle having two separate openings when mounted, generally directing spray into and rearward of the direction of travel

3.3.6
centrifugal energy nozzle
rotary nozzle
rotary atomiser
device atomizing the spray liquid by centrifugal energy

3.3.7
deflector nozzle
anvil nozzle
impact nozzle
flood(ing) nozzle
hydraulic energy nozzle with a deflector producing a flat sheet of spray, with the shape of the spray dependent on the deflector

3.3.8
off-centre nozzle
nozzle in which the fan pattern is not symmetrical around the centerline of travel for the nozzle

3.3.9
off-centre fan nozzle
fan nozzle in which the angle of the spray sheet and volume distribution are asymmetrical about the nozzle axis

3.3.10
directional nozzle
nozzle which enables the direction of spray to be altered

3.3.11
cone nozzle
hydraulic energy nozzle in which the spray liquid flows rotationally, or is swirled, producing a conical sheet of spray at the nozzle tip

3.3.12
hollow cone nozzle
disc-core nozzle
cone nozzle in which most of the spray liquid is in the outside of the conical spray pattern

3.3.13
solid cone nozzle
full cone nozzle
cone nozzle in which spray liquid is directed throughout the conical spray pattern

3.3.14
solid stream nozzle
nozzle which produces a cylindrical spray

3.3.15
impinging stream nozzle
hydraulic energy nozzle designed so that spray is produced by the impact of two or more streams of spray liquid

3.3.16
pneumatic nozzle
nozzle in which the spray is produced by the action of an air stream on the spray liquid

3.3.17
twin fluid nozzle
air atomizing nozzle
nozzle in which mixing of spray liquids or the spray liquid and air takes place within the nozzle with the spray discharged through a common nozzle tip

3.3.18
air shear nozzle
pneumatic nozzle using a large volume of high velocity air

3.3.19
vibratory nozzle
nozzle in which an oscillating solid surface is the primary source of energy used to produce the spray

3.3.20
ultra-sonic nozzle
pneumatic or vibratory nozzle in which energy is imparted to the spray by (ultra-) sonic waves

3.3.21
fog nozzle
nozzle for producing a fog

3.3.22
pre-orifice nozzle
nozzle with an internal orifice that meters the spray liquid prior to producing spray at the nozzle tip

3.3.23
variable orifice nozzle
nozzle with an adjustable opening to vary spray liquid flow rate and/or droplet size

3.3.24
air induction nozzle
Venturi nozzle
nozzle which accelerates spray liquid velocity to suck external (generally atmospheric) air into a reduced pressure chamber to mix with the spray liquid

3.3.25
pulse width modulation (PWM) nozzle
nozzle using a controlled solenoid valve to determine the volume of spray liquid sprayed from the nozzle, thereby allowing independent variation of spray liquid flow rate and pressure

3.3.26
vibrating reed nozzle
vibratory nozzle in which individual droplets are formed from a needle point attached to an oscillating reed

3.3.27
vibrating needle nozzle
vibratory nozzle in which spray liquid under pressure is passed through a vibrating needle to form a liquid jet which disintegrates into droplets

3.3.28
piezoelectric vibratory nozzle
Bergland-Liu nozzle
vibratory nozzle in which a piezoelectric transducer transmits high frequency oscillations to a liquid jet to create droplets

3.3.29
electromagnetic vibratory nozzle
vibratory nozzle in which an electromagnetic transducer transmits high frequency oscillations to a liquid jet to create droplets

3.3.30
adjustable nozzle
hydraulic energy nozzle designed so that the spray liquid flow rate to the nozzle tip and spray droplet size can be altered without changing the components

3.3.31
nozzle body
nozzle holder
main component into or on which other components of a nozzle are fitted, generally mounted on the spray boom, nozzle bar or spray lance

Note 1 to entry: In some designs, the nozzle boss (3.3.33) performs the function of the body and the cap (3.3.32) screws directly on to the boss.

3.3.32
nozzle cap nut
component which retains the assembled parts in or on a nozzle body

Note 1 to entry: The nozzle disc (3.3.35) or tip (3.3.34) may be integral with the cap.

3.3.33
nozzle boss
part of the sprayer boom or spray lance to which a nozzle body or cap nut is fitted

3.3.34
nozzle tip
component containing the final orifice of a nozzle, usually a fan nozzle

3.3.35
blank nozzle disc
device to prevent the emission of spray liquid from a nozzle, usually a solid insert

3.3.36
nozzle disc
component containing the final orifice of a cone nozzle

3.3.37
multi-head nozzle
assembly containing two or more nozzles, any one (or more) of which can be spraying

3.3.38
turret nozzle
rotating assembly containing two or more nozzles, any one of which can be brought into the spraying position

3.3.39
nozzle deflector
component of a nozzle which deflects the spray liquid after its emission from the final nozzle orifice

3.3.40
swirl plate
swirl core
component of a cone nozzle which imparts rotary motion to the spray liquid

3.3.41
swirl back-plate
component of a particular type of cone nozzle which forms the rear part of the swirl chamber and the tangential spray liquid entry channels

3.3.42
swirl chamber
cavity or chamber in a cone nozzle in which the spray liquid rotates or is swirled

3.3.43
nozzle spacing
distance between adjacent nozzles on a sprayer boom or sprayer lance

3.3.44
nozzle orientation
angle of nozzle bodies and tips to the vertical

3.3.45
spray angle
angle formed close to a nozzle by the edges of the spray sheet formed at the nozzle tip

3.3.46
nominal spray angle
spray angle obtained at a reference pressure for a given type of fan nozzle

3.3.47
spray angle offset
angle differential of adjacent nozzles to avoid collision of spray patterns

3.3.48
nozzle flow control method
method for setting a constant spray liquid output rate delivered by a nozzle

3.3.49
nozzle flow control setting
the spray liquid output rate set to be delivered by a nozzle

3.4 Sprayers

3.4.1
hydraulic pressure sprayer
appliance using one or more hydraulic energy nozzles for spraying

3.4.2
air-assisted hydraulic pressure sprayer
hydraulic energy sprayer using air assistance to carry the droplets

3.4.3
centrifugal sprayer
appliance using one or more centrifugal energy nozzles for spraying

3.4.4
air-assisted centrifugal sprayer
centrifugal sprayer using air assistance to carry the droplets

3.4.5
pneumatic sprayer
appliance with one or more pneumatic nozzles

3.4.6
twin fluid sprayer
appliance with one or more twin fluid nozzles

3.4.7
fogger
aerosol generator
appliance for producing a fog or aerosol

3.4.8
thermal sprayer
appliance for thermal spraying