

SPRAY APPLICATION IN CITRUS – SPRAYER CALIBRATION AND CHECKLIST

by

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Fungicides and pesticides are only as effective as their application. The main objective of spray application is the **optimal** dose transfer of the **well agitated** tank mix, which includes one or more active ingredients, from the **sprayer** to the **tree**, whilst keeping off-target losses from **run-off** and **drift** at a **minimum**. For effective disease or pest control, deposition of a **uniform distribution** of the required quantity of active ingredient(s) is required on the intended targets, be it outside-cover sprays on the outer canopy, medium-cover sprays on all fruit and medium-sized branches to full-cover sprays on all parts of the tree above the ground. Whilst high spray volumes (> 10,000 L/ha) generally meet the requirements for

medium- to full-cover sprays, higher volume sprays are less efficient in terms of time and cost effectiveness. Reduced volume applications offer the potential for significant cost and time savings, but these applications require much more diligent attention to spray technique, sprayer calibration and maintenance.

The attached quick guide includes a spray checklist to be followed before and during the spray season, calibration guidelines as well as basic implementation factors. This guide should be consulted whenever citrus orchards are sprayed.

For chemical store guides and mixing procedure tables contact Gideon van Zyl – gideonvzyl@sun.ac.za.

Spray application checklist				
Implement	Item/tool	Method	Reason	
Tractor	PTO speed (rpm) vs. RPM tractor gauge	<ul style="list-style-type: none"> Use a calibrated tachometer to measure the actual PTO speed Mark the correct RPM on the tractor's RPM gauge. 	Incorrect PTO speed leads to decreased pump performance and reduced lifetime	
	Determine tractor speed	<ul style="list-style-type: none"> With sprayer attached, 1/3 filled with water at recommended PTO speed (540 rpm). Measure driving time over a level, measured test strip e.g. 50 m or 100 m. Do this for all low gears (spraying gears). 	Tractor speed changes over time, for example as tyres wear. Accurate knowledge of tractor speed is important since it is a determining factor of spray volume and effectiveness of application. It directly influences canopy penetration, deposition and uniformity.	
	$Speed (km/h) = \frac{\text{Distance (m)} \times \text{Factor (3.6)}}{\text{Time measured (sec)}}$			
	PTO Shaft and belts	<ul style="list-style-type: none"> Lubricate and thoroughly attach. Check belt tension and proper PTO connection. Universal joints should be properly attached with no play. PTO cover should be present. 	Proper PTO connection and belt tension is needed for optimal energy transfer.	
Spray machine Fill sprayer 1/3 volume with clean water. Pressurize sprayer	Tank volume vs. actual volume	<ul style="list-style-type: none"> Check if the tank volume meter is accurate. Use a flow meter Recalibrate the volume indicator on the spray tank as needed 	Inaccurate tank volume will result in under/over dosing when agrochemical is applied to water in the tank.	
	Taps	<ul style="list-style-type: none"> Thoroughly open and close; no leaks. 		
	Pump/filter/diaphragm	<ul style="list-style-type: none"> Check, clean or replace regularly. Pump should be cleaned with clean water by pumping it through the system after each spray. Check pump oil regularly and replace as necessary. Pump capacity: The pump must be able to deliver 20 to 30% more than the flow rate needed to achieve a certain spray volume (do not use as max. capacity). Lack of pump capacity can impair tank agitation and accurate volume delivery. 	A clogged filter or diaphragm impairs the flow of the spray mixture to the nozzles. Subsequently the nozzles do not deliver the correct amount, making the application volume inaccurate. Also, with granular formulations, the concentration of the spray mixture may be influenced.	
	Pipes	<ul style="list-style-type: none"> Check for leaks and cracks. Pipes should be properly attached to sprayer and tractor control 	Leaking pipes will not pressurise adequately since there is a loss of	

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		valve.	pressure. This will result in a loss of spray mixture, as well as impairing the nozzle flow rate resulting in inaccurate spray volume.
	Oscillating arms	<ul style="list-style-type: none"> • Oscillating arms/booms should be lubricated and checked for irregularities. • Optimal oscillation speed is 70-75 times per minute. 	If oscillation is impaired, it will result in inadequate coverage and canopy penetration.
	Fan	<ul style="list-style-type: none"> • Check for chipped, broken fan blades – unbalanced fans are usually an indication of dirty or damaged fans. • The intake of the fan should be free of any debris (leaves, mud, twigs etc.) 	<p>Broken fan blades can break off and cause damage to the spray machine and operator.</p> <p>Blocked intakes can put unnecessary stress on the PTO.</p> <p>This will also affect the air output (volume and speed) supplied to the spray tower, influencing the distribution and carrier capacity of the air, which will negatively affect deposition parameters.</p>
	Number nozzles	<ul style="list-style-type: none"> • Allocate numbers to nozzle positions on the spray tower that are visible from the tractor cab. 	This will help the operator to identify faulty nozzles.
	Tower	<ul style="list-style-type: none"> • Check the tower for cracks and holes - no air should escape the tower. 	Air escaping from the tower will reduce the air pressure, volume and speed thereby negatively affecting the carrier capacity and distribution of the spray plume.
	Pressure gauge	<ul style="list-style-type: none"> • Check whether the pressure gauge displays pressure correctly - a new gauge can be used to evaluate pressure. 	Inaccurate pressure indications will result in the wrong spray volume.
	Tank/Tank agitator(s)	<ul style="list-style-type: none"> • Wash tank thoroughly with clean water. • If necessary, use tank cleaning agent. • Tank should be properly attached to sprayer frame. • Check tank for cracks, holes. • Mechanical agitators – check propeller blades as well as shaft connections/glands and the drive belt. • Hydraulic returns/jets should be sufficient to agitate the whole tank; however, can the pump handle it when spraying high volume? 	Sufficient agitation of the spray mixture is needed. Poor agitation will result in non-uniform distribution of the product used, which in turn will result in different dosages of product being transferred to the tree. This can result in treatment failures, phytotoxicity as well as possible resistance build-up.

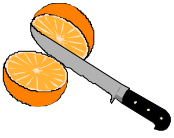
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		<ul style="list-style-type: none"> • The bigger the tank, the higher the rate of agitation needed. • The spray mixture should be properly agitated before applied. Depending on the products used and the size of the tank, it may take up to 15 min before the mixture is uniformly agitated. 	
Spray nozzles	Clean nozzles/filters	<ul style="list-style-type: none"> • Use a nylon brush or compressed air. • DO NOT USE WIRE, TOOTHPICKS, SHARP OBJECTS – ESPECIALLY WITH CERAMIC NOZZLES. 	Clogging is the result of dirty application water and debris or undissolved chemicals. Clogged nozzles will affect spray pattern, spray volume and decrease the lifetime of the nozzle. This can lead to inadequate coverage, under-application and treatment failure.
	Nozzle layout/installation	<ul style="list-style-type: none"> • Ensure nozzles are fitted correctly according to the predetermined setup. • Nozzle layout must be based on needed delivery (See large adjustments). • Do not use disc and core (whirlers) of different materials. • Make sure disc and core are not installed backwards. • Replace nozzle seal • Do not over-tighten caps. • Make sure the spray plumes overlap in the spray pattern before they reach the target. • Ensure that nozzle spray is intercepted by foliage to reduce off-target drift. 	Incorrect nozzle material or nozzle brand will decrease nozzle life and will not deliver an accurate flow. The system will not pressurise optimally with leaks present and if the seal is not installed, thus influencing flow rate.
	Nozzle health	<ul style="list-style-type: none"> • Replace worn nozzles, or nozzles with distorted orifices. • The lifespan of nozzles is dependent on the material it is made from and the amount of sprays applied. • It is good practice to replace nozzles 2 to 4 times a season. • Use nozzles made from durable material such as ceramics. 	Worn/distorted nozzles will result in inaccurate application volumes, coverage, and droplet formation. This in turn will result in over-application, run-off, poor deposition uniformity and quantity and increase environmental pollution. It may also increase the chance of phytotoxicity.
	Nozzle flow rate	<p>Two methods can be used to determine nozzle flow rate:</p> <ul style="list-style-type: none"> • Precise method: Measurement of individual nozzle outputs over 1 min: cover nozzles with pipes; measure flow into bucket. • Good estimation method: Measurement of tank volume sprayed during 5 min. 	Determining nozzle flow rate can be tedious. It is however very important. For example: 10% deviation from actual flow rate on a 10 000 L/ha spray will result in 1000 L/ha over-application.

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		<ul style="list-style-type: none"> If differing by more than 10%, replace nozzle. 	
Calibration	Spray volume	$volume \frac{L}{ha} = \frac{\text{Nozzle flow rate (L/min)} \times \text{Factor (600)} \times \text{No. open nozzles}}{\text{Row spacing (m)} \times \text{Tractor speed (km/h)}}$ $volume (L) \text{ delivered on both sides/m} = \frac{\text{Nozzle flow rate (L/min)} \times \text{No. open nozzles}}{\text{Tractor speed (m/min)}}$	
	Large adjustments (nozzle selection)	<ul style="list-style-type: none"> Calculate the required flow-rate per nozzle based on the calibrated tractor speed and targeted spray volume. Select the appropriate nozzle size from nozzle charts. $L/\text{min per nozzle} = \frac{\text{Speed (km/h)} \times \text{Row spacing (m)} \times \text{Spray volume (L/ha)}}{\text{Factor (600)} \times \text{No. open nozzles}}$ <ul style="list-style-type: none"> Nozzle layout must be based on required delivery e.g. Spray volume delivery: 25% top 6 full cone nozzles 60% middle 12 Hollow and Full cone alternating nozzles 15 % bottom 6 Hollow and Full cone alternating nozzles 	
	Medium adjustments (tractor speed)	<ul style="list-style-type: none"> Optimal spraying speed 1.7 to 2.4 km/h for full or medium cover. If canopy is “spray friendly”, faster tractor speeds, not exceeding 3.6 km/h can be used for medium cover or outside film cover. Bait sprays on the outer canopy can be applied at higher speeds if the orchard surface allows this. 	<p>Too fast speeds = reduced spray coverage, penetration and uniformity.</p> <p>Too slow speed = over-application, excessive run-off, not economical.</p> <p>Use “water sensitive paper” to evaluate spray plume penetration into the canopy at different speeds</p>
	Small adjustments (pressure)	<ul style="list-style-type: none"> Adhere to pressure range indicated by nozzle manufacturer. Usually between 5 to 20 bar. 	<p>Too high spray pressures will decrease nozzle and pump lifespan – not economical.</p>
Tree canopy	Canopy density	<ul style="list-style-type: none"> Manage canopy to reduce density. 	<p>Dense canopy walls tend to shield/shingle</p>

		<ul style="list-style-type: none"> • Prune windows in the canopy to help with aeration and spray penetration. • Spray plume must readily reach the far side of the canopy. • Use water sensitive paper to evaluate whether adequate canopy penetration is achieved. 	<p>as the sprayer passes, especially when leaves are large. This reduces spray penetration, coverage and deposition uniformity on the inside of the canopy. It also aggravates run-off on the outer canopy leaf wall.</p>
Preparation of tank mix		<ul style="list-style-type: none"> • Calculate g or ml/100 L product needed for spray tank. $product (g \text{ or } ml) = \frac{\text{Label rate (g/100 L)}}{\text{Conversion factor (100)}} \times \text{Volume of water in spray tank (L)}$ <ul style="list-style-type: none"> • Wear proper protective clothing as indicated by product labels. • Follow label instructions. • If mixing products, make sure they are compatible. • Fill spray tank with 1/3 water through hatch filter. • Mixing procedure: Buffer/conditioner → DF, WDG, WP → SC → SL, SP → adjuvants & Stickers → Oil → EC. • Pre-mix calculated amount/s of product in a bucket with water before adding to spray tank. • Add mixed product and fill tank to volume of spray tank. • Remember proper agitation. 	
Spray operators		<ul style="list-style-type: none"> • Only use properly trained operators. • Operators should wear proper protective clothing. • Monitor operators regularly – GPS tracking/spot checks. • Implement “report back” protocol for operators to report spray procedure, problems. 	



SPUIT TOEDIENING IN SITRUS – SPUIT KALIBRASIE EN KONTROLELYS

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Swamdoders en insekdoders is slegs so effektief as wat dit toegedien word. Die hoofdoel van spuittoediening is optimale oordrag van 'n goed gemengde spuitmengsel van een of meer aktiewe bestanddele vanaf die spuitmasjien na die boom, terwyl nie-teiken verliese a.g.v. afloop en dryf tot 'n minimum beperk word. Vir effektiewe siekte- en plaagbestuur is neersetting en uniforme verspreiding van die vereiste kwantiteit aktiewe bestanddeel(e) op die noodsaaklike teikens nodig. Dit mag 'n buite-blaar kap, ligte-dek bespuiting wees, of 'n medium-dek bespuiting op alle vrugte

en medium-grootte takke wees, of 'n vol-dek bespuiting op alle boomdele bo die grond. Hoë-volume toedienings (> 10,000 L/ha) voldoen in die algemeen aan die vereistes vir 'n medium- tot vol-dek bespuiting, maar is minder ekonomies in terme van tyd en koste-effektiwiteit. Verlaagde volume toedienings bied die potensiaal vir beduidende koste- en tyd-besparings, maar hierdie tipe toedienings benodig baie meer nougesette aandag aan tegniek, spuit-kalibrasie en instandhouding van spuittoerusting.

Die aangehegde gids sluit 'n spuittoeding kontrolelys wat gevolg moet word voor en tydens die spuit-seisoen, kalibrasie riglyne sowel as basiese implementeringsfaktore in. Hierdie gids moet geraadpleeg word wanneer sitrus boorde gespuit word.

Vir chemiese stoor gidse en mengvolgorde tabelle, kontak Gideon van Zyl – gideonvzyl@sun.ac.za.

Spuittoediening kontrolelys				
Implement	Item/toerusting	Metode	Rede	
Trekker	PTO spoed (RPM) vs. RPM trekker meter	<ul style="list-style-type: none"> • Gebruik 'n gekalibreerde toereter om PTO spoed te meet. • Merk die korrekte RPM op die trekker se RPM meter. 	Verkeerde PTO spoed lei tot swakker pomp werking en verminder die pomp se leeftyd.	
	Stel trekker spoed vas	<ul style="list-style-type: none"> • Met die spuit gehak, 1/3 vol met water by die voorgestelde PTO spoed (540 rpm). • Meet ry-tyd oor 'n gelyke toets-strook van bv. 50 m of 100 m. • Doen dit vir alle lae ratte (spuit ratte). 	Trekker spoed verander met tyd, bv. met die afloop van bande. Akkurate kennis van trekkerspoed is belangrik siende dit 'n bepalende faktor van spuit volume en effektiwiteit van toediening is. Dit beïnvloed effektiwiteit van blaar kap penetrasie, neersetting en uniformiteit van bedekking direk.	
	$Spoed (km/h) = \frac{\text{Afstand (m)} \times \text{Faktor (3.6)}}{\text{Tyd gemeet (sek)}}$			
	PTO en gordels	<ul style="list-style-type: none"> • Smeer koppelaar en heg deeglik vas. • Maak seker van gordel-spanning en PTO hegting. • Universele hegtings moet behoorlik aangeheg wees met geen speling. • PTO dekplastiek moet teenwoordig wees. 	Behoorlike PTO hegting en bandspanning is nodig vir optimale oordrag van energie. Swak hegting, speling en oop PTOs/gordels, kan skade aan die masjien en operateur tot gevolg hê.	
Spuit masjien	Tenk volume vs. werklike volume	<ul style="list-style-type: none"> • Maak seker dat die tenk volume-meter akkuraat is. • Gebruik 'n vloeimeter om akkuraatheid te toets. • Herkalibreer die volume aanwyser op die spuit tenk soos nodig. 	Onakkurate tenk volume sal lei tot onder- of oor-dosering.	
	Krane	<ul style="list-style-type: none"> • Krane moet deeglik oop en toe maak met geen lekkasies. 		
	Maak spuit 1/3 vol met skoon water. Bring spuit op druk. Pomp/filter/diafragma	<ul style="list-style-type: none"> • Gaan na, maak skoon en vervang gereeld. • Die pomp moet skoongemaak word met skoon water of spoelmiddel na elke spuit. • Gaan pomp se olie gereeld na en vervang soos nodig. • Pomp kapasiteit: die pomp moet 20 tot 30% meer volume kan lewer as wat nodig is vir die totale vloeitempo (L/min) om 'n spesifieke volume te kan lewer. 	'n Verstoppe filter of diafragma belemmer die vloei van die mengsel na die spuitkoppe. Gevolglik sal die spuitkoppe nie die korrekte volume lewer nie, wat totale toedieningsvolume beïnvloed. Dit kan ook die konsentrasie, veral met korrel formulasies, beïnvloed.	

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		<ul style="list-style-type: none"> • 'n Gebrek aan pomp kapasiteit kan die tenk roer-aksie asook akkurate volume lewering benadeel. 	
	Pype	<ul style="list-style-type: none"> • Gaan na vir krake, snye en lekplekke, vervang indien nodig. • Alle pype moet goed aan die spuitmasjien self geheg wees, asook die pype aan die beheerklap op die trekker. 	Lekkende pype sal nie voldoende druk opbou nie. Dit sal lei tot 'n verlies van spuit-mengsel en belemmer ook die vloeitempo wat die spuitkop moet lewer, wat lei tot onakkurate spuitvolumes.
	Ossillerende arms	<ul style="list-style-type: none"> • Ossillerende arms moet goed gesmeer word en nagegaan word vir foute. • Optimale ossillasie-spoed is 70-75 keer per minuut. 	As ossillasie foutief is, sal dit lei tot onvoldoende bedekking en blaar kap penetrasie.
	Waaier	<ul style="list-style-type: none"> • Gaan na vir beskadigde of gebreekte waaierlemme – ongebalanseerde waaiers is gewoonlik 'n aanduiding van vuil of beskadigde waaierlemme. • Die opening van die waaier moet vry wees van enige belemmering (blare, modder, takkies ens). 	Beskadigde/gebreekte waaierlemme kan die spuitmasjien beskadig of die operateur beseer. Geblokte waaier-openinge kan onnodige stremming op die PTO/pomp sit. Dit sal lug-uitset (volume en spoed), gelewer aan die spuitoring, beïnvloed, wat die distribusie en dra-kapasiteit van die lug sal belemmer, en op die einde neersetting parameters benadeel.
	Aantal spuitkoppe	<ul style="list-style-type: none"> • Nommer spuitkoppe op die spuitoring sodat dit sigbaar is vanaf die trekker. 	Dit sal die operateur help om foutiewe spuitkoppe te identifiseer.
	Toring	<ul style="list-style-type: none"> • Gaan die spuit lug-toring na vir krake en gate – geen lug moet van die spuit lug-toring ontsnap nie. 	Lug wat van die toring ontsnap, sal die lugdruk daarbinne beïnvloed, wat gevolglik lugspoed en -volume belemmer. Dit sal dra-kapasiteit en distribusie van die spuitnewel negatief beïnvloed.
	Druk meter	<ul style="list-style-type: none"> • Gaan na of die drukmeter die regte druk aandui – 'n nuwe drukmeter kan gebruik word om die druk lesing te evalueer. 	Onakkurate druk sal lei tot verkeerde spuitvolumes.
	Tenk/Tenk menger(s)	<ul style="list-style-type: none"> • Was tenk deeglik met skoon water. • As nodig, gebruik tenk wasmiddels. • Die tenk moet goed aan die spuitmasjien-raam vas wees. • Gaan na vir krake/gate. • Meganiese mengers – gaan waaierlemme sowel as die skag/skag konneksies/dryf band na. 	Genoegsame roer-aksie van die spuit-mengsel is nodig. 'n Swak mengaksie sal lei tot onegalige verspreiding van die produk in die tenk, wat sal lei tot oneweredige produk-oordrag na die boom. Dit kan lei tot oneffektiewe beheer, fitotoksiteit,

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		<ul style="list-style-type: none"> • Hidroliese spuite – moet genoegsaam wees om die hele tenk te meng. Maak seker die pomp kapasiteit is voldoende. • Hoe groter die tenk, hoe hoër die roertempo nodig. • Die spuitmengsel moet behoorlik geroer/gemeng word voor toediening. Afhangende van die produkte wat gebruik word en die grootte van die tenk, kan dit tot 15 minute neem vir die mengsel om egalig te roer. 	vermorsing en moontlike opbou van weerstand.
Spuitkoppe	Skoonmaak van spuitkoppe en filters	<ul style="list-style-type: none"> • Gebruik 'n nylon borsel of hoëdruk lugspuit. • MOENIE DRAAD, TANDESTOKKIES, SPYKERS OF ENIGE SKERP VOORWERPE GEBRUIK NIE – VERAL NIE MET KERAMIEK SPUITKOPPE NIE. 	Verstopping van spuitkop is a.g.v. vuil water, ander nuwe-materiaal en onopgeloste chemikalieë. Verstopte spuitkoppe sal spuitpatroon en volume beïnvloed en spuitkop-leef tyd belemmer. Dit kan lei tot onvoldoende neersetting, onder-dosering en oneffektiewe beheer.
	Spuitkop uitleg/installering	<ul style="list-style-type: none"> • Maak seker spuitkoppe is reg opgestel volgens die voorafbepaalde opstelling. • Spuitkop-uitleg moet gebaseer wees op die benodigde lewering (Sien groot aanpassings). • Moenie plaatjies en kerne gebruik van verskillende materiaal. • Maak seker dat die plaatjie en kern nie verkeerd-om opgestel is nie. • Vervang spuitkop-seël gereeld. • Moenie spuitkop-boudte te styf vasdraai nie. • Maak seker die spuitnewel oorvleuel in die spuitpatroon voordat dit die teiken bereik. • Maak seker dat die spuitnewel deur die teiken opgevang word om dryf te verminder. 	Verkeerde spuitkop materiaal en produk sal spuitkop lewensduur verlaag en sal nie 'n akkurate vloeitempo lewer nie. Die spuit sal nie voldoende druk opbou as daar lekkasies is nie en dus sal spuitkoppe nie die regte vloeitempo lewer nie.
	Spuitkop toestand	<ul style="list-style-type: none"> • Vervang verslete/verweerde spuitkoppe. • Die leeftyd van 'n spuitkop hang van die materiaal af waarvan dit gemaak is asook die hoeveelheid toedienings wat dit dien. • Dit is goeie praktyk om spuitkoppe gereeld te vervang; 2 tot 4 keer per spuitseisoen. • Gebruik spuitkoppe gemaak van bestaande materiaal bv. keramiek. 	Verslete/verweerde spuitkoppe sal lei tot onakkurate spuitvolumes, bedekking en druppel-formasie. Dit lei tot oor-toediening, afloop, swak neersetting, uniformiteit en kwantiteit en vermeerder omgewingsbesoedeling. Dit kan ook die kans vir fitotoksiteit verhoog.

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	Spuitkop vloeitempo	<p>Twee metodes kan gebruik word om spuitkop-vloei te bepaal:</p> <ul style="list-style-type: none"> • Presiese metode: Meet spuitkoppe individueel oor 1 min: Sit pyp oor spuitkoppe, meet lewering in maatemmer oor tyd. • Goeie skattingsmetode: Meet verlies in spuit volume oor 5 min. • As verskil met meer as 10%, vervang die spuitkop. 	Die bepaling van 'n spuitkop vloeitempo kan omslagtig wees. Dit is tog baie belangrik; bv. 'n 10% afwyking van die vloeitempo op 'n 10 000 L/ha spuit beteken 1000 L/ha gaan verlore op 'n elke ha.
	Spuit volume	$volume \frac{L}{ha} = \frac{\text{Spuitkop vloeitempo (L/min)} \times \text{Faktor (600)} \times \text{aantal. oop spuitkoppe}}{\text{Ry spasiëring (m)} \times \text{Trekker spoed (km/h)}}$ $volume (L) \text{ gelewer aan altwee kante/m} = \frac{\text{Spuitkop vloeitempo (L/min)} \times \text{aantal. oop spuitneuse}}{\text{Trekker spoed (m/min)}}$	
Kalibrasie	Groot aanpassings (spuitkop-keuse)	<ul style="list-style-type: none"> • Bereken die benodigde vloei-tempo per spuitkop gebaseer op gekalibreerde trekkerspoed en teiken spuitvolume. • Kies die regte spuitkop kombinasie vanaf die spuitkop grafiek. $L/ \text{min per spuitneus} = \frac{\text{Spoed (km/h)} \times \text{Ry spasiëring (m)} \times \text{Spuit volume (L/ha)}}{\text{Fator (600)} \times \text{aantal oop spuitkoppe}}$ <ul style="list-style-type: none"> • Spuitkop-uitleg moet gebaseer wees op die bepaalde lewering bv. Spuit volume lewering: 25% bo 6 volkeël spuitkoppe. 60% middel 12 holkeël en volkeël alternerende spuitkoppe. 15 % onder 6 holkeël en volkeël alternerende spuitkoppe. 	
	Medium aanpassings (trekker spoed)	<ul style="list-style-type: none"> • Optimale trekker spoed is 1.7 tot 2.4 km/h vir vol- en medium-dek bespuitings. • As die blaar kap "spuit vriendelik" is, kan trekker spoed tot en met 3.6 km/h gebruik word vir medium-dek en buite-blaar kap bespuitings. • Lokaas bespuitings op die buite blaar kap kan by vinniger 	<p>Te vinnige trekker spoed = verlaagde spuitbeddeking, penetrasie en uniformiteit.</p> <p>Te stadige trekker spoed = oor-toediening, afloop en onekonomies.</p> <p>Gebruik watersensitiewe papier as</p>

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		trekkerspoed toegedien word as die boord-oppervlak die spoed akkommodeer.	indikator om te sien of die spuitnewel die blaar kap gereedelik penetreer en pas trekkerspoed daarvolgens aan.
	Klein aanpassings (druk)	<ul style="list-style-type: none"> Hou by druk reeks aangedui deur spuitkop vervaardiger. Gewoonlik tussen 10 tot 20 bar. 	Te hoë spuitdruk bevorder nie blaar kap penetrasie nie, verminder spuit kop leeftyd en sit onnodige meganiese stremming op pomp.
Boom blaar kap	Blaar kap digtheid	<ul style="list-style-type: none"> Beheerblaar kap digtheid. Snoei vensters in blaar kap om spuitnewel-penetrasie en lugvloei te bevorder. Die spuitnewel moet die middel en vêrste kant van die blaar kap gereedelik kan bereik. Gebruik watersensitiewe papier om te evalueer of die spuitnewel die blaar kap penetreer. 	Digte blaar kap is geneig om te oorvleuel en penetrasie te verhinder, veral as die blare baie groot is. Dit bemoeilik en verlaag penetrasie, bedekking en neersetting uniformiteit aan die binnekant van die blaar kap. Dit vererger ook afloop aan die buitekant van die blaar kap.
Voorbereiding van tenkmengsel		<ul style="list-style-type: none"> Bereken g or ml/100 L produk benodig vir 'n spuit tenk. $produk (g \text{ or } ml) = \frac{\text{etiket dosis (g/100 L)}}{\text{Omskakelings faktor (100)}} \times \text{Volume water in spuit tenk (L)}$ <ul style="list-style-type: none"> Dra gepaste beskermende klere soos aangedui deur die produk etiket. Volg etiket instruksies. As produkte gemeng word, maak seker dit is verenigbaar. Maak die tenk 1/3 vol water deur die deksel filter. Meng prosedure: Buffer/ Bevorderaar → DF, WDG, WP → SC → SL, SP → Benatters & Kleefmiddels → Olie → EC. Meng produkte vooraf in 'n emmer saam met water en dien dan tot tenk toe. Onthou genoegsame mengtyd voor bespuiting. 	
Operateur/toediener		<ul style="list-style-type: none"> Gebruik slegs goed opgeleide operateurs. Operateurs moet altyd nodige beskermende klere dra tydens tenk voorbereiding en toediening. Monitor operateurs gereeld – “GPS tracking/spot checks”. Implementeer 'n verslag-protokol sodat operateurs enige foute, probleme kan rapporteer. 	

JOU HEFFING WERK VIR JOU – PRODUSENTE SE HEFFINGS WORD AANGEWEND OM DIE AKTIWITEITE VAN DIE CRI TE BEFONDS