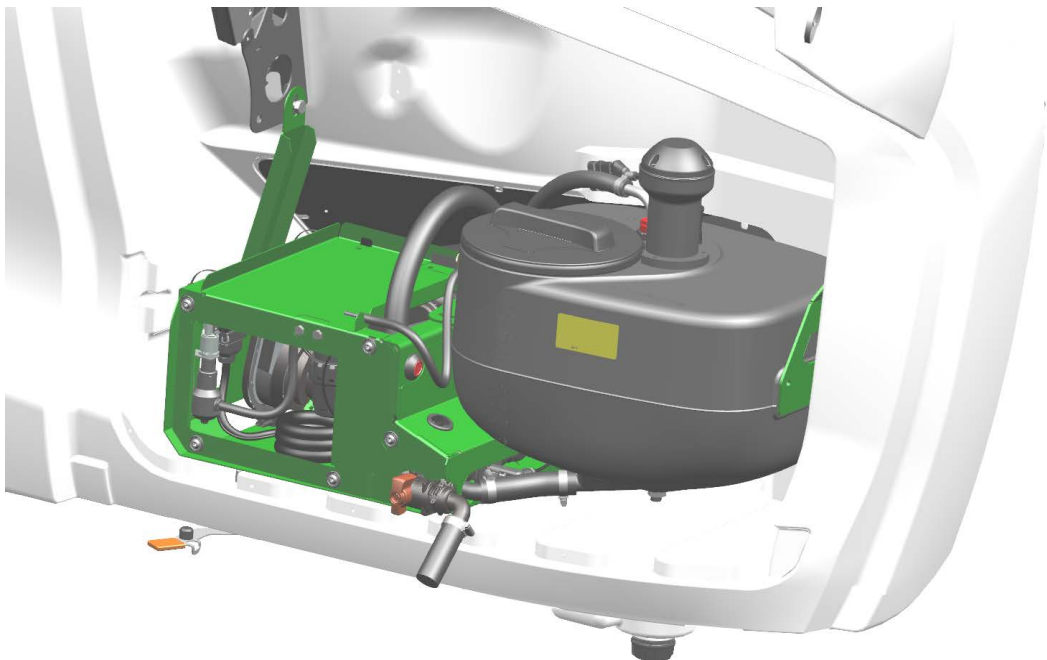


# Supplementary operating manual

## **AMAZONE**

### **UX Super CP Plus DirectInject**

#### **Trailed field sprayer with direct injection**



MG7510  
BAG0239.6 11.23  
Printed in Germany

SmartLearning



**en**

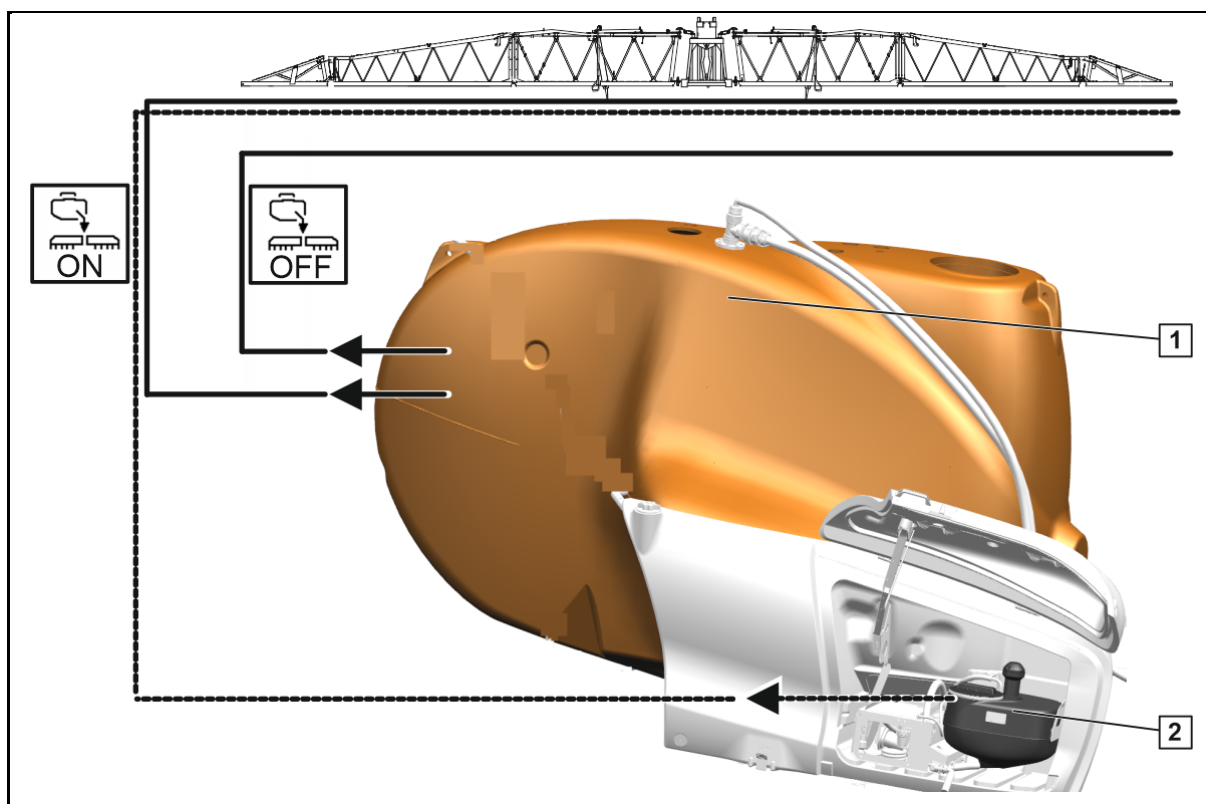




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# 1 Product description

## 1.1 Function



Direct injection enables additional injection of an agent into the spray liquid of the spray liquid tank.

Injection takes place at several points in the spray line of the sprayer boom.

The additional direct injection can be switched on and off.

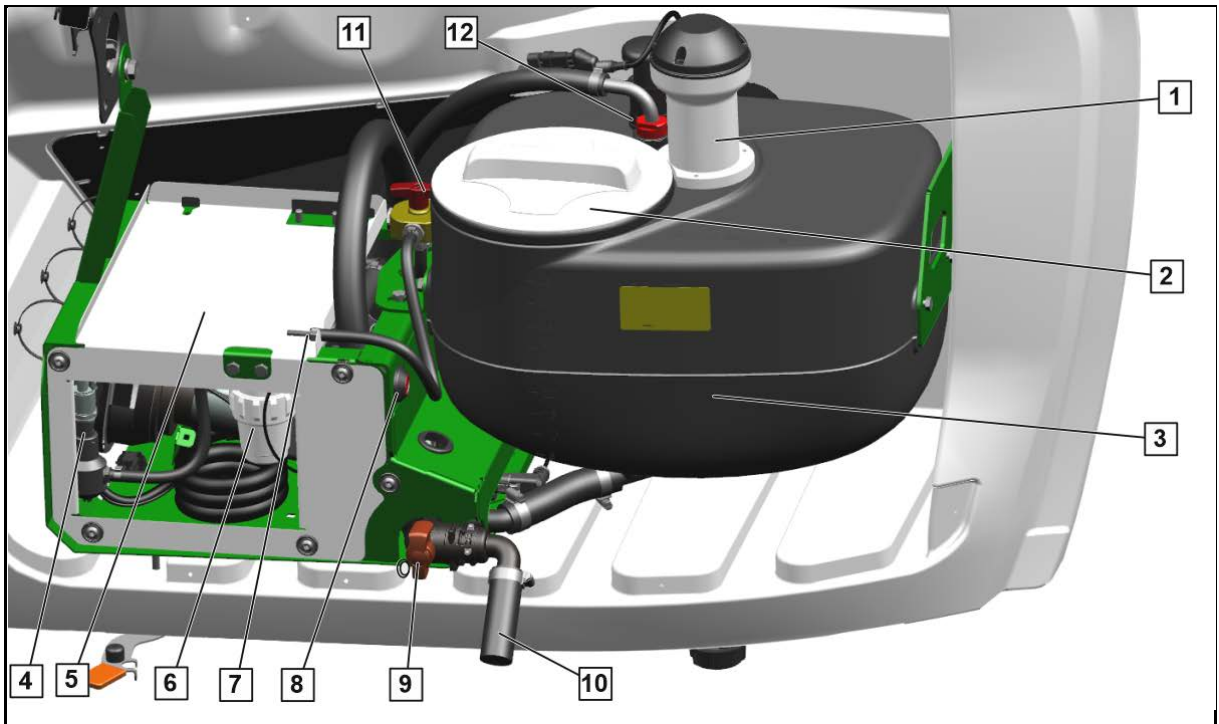
It is operated using ISOBUS via the control terminal.

### **Direct injection functions:**

- Applying an additional agent
- Cleaning the system

When the direct injection is switched on, HighFlow+ is deactivated.

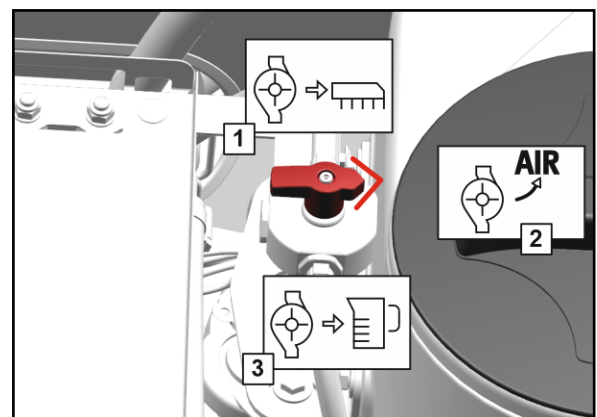
## 1.2 Overview of DirectInject



- (1) Agitator
- (2) Filling opening of the agent tank with lid
- (3) Agent tank for direct injection
- (4) Pressure sensor for the cleaning nozzle
- (5) Pump cover
- (6) Pressure filter of the cleaning nozzle
- (7) Calibration hose
- (8) Button for venting the pump
- (9) Drain tap for agent tank
- (10) Drain from agent tank
- (11) Pump switch tap
- (12) Cleaning nozzle

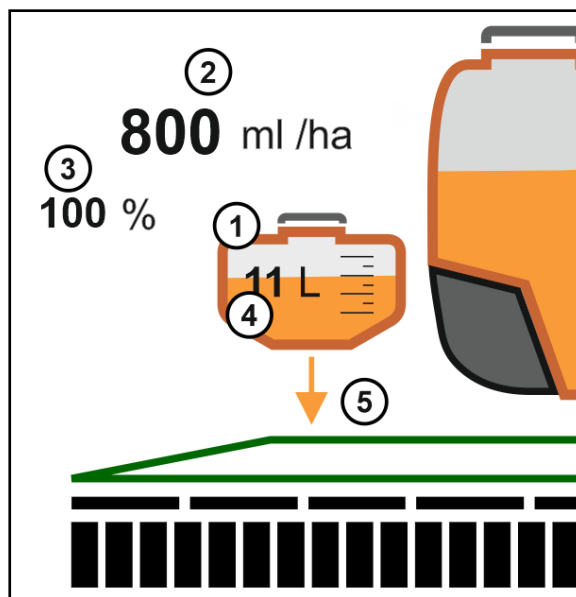
### Pump switch tap

- (1) Spraying operation position
- (2) Venting after filling position
- (3) Flushing and rate control



## 1.3 Overview of the Work menu

- (1) Tank for direct injection
  - Grey – direct injection not prepared
  - Orange – direct injection prepared
- (2) Application rate for direct injection
- (3) Application rate in %
- (4) Calculated fill level
- (5) Direct injection application
  - Orange arrow – Agent for direct injection is applied from all nozzles
  - Grey dashed arrow – Agent is not yet being applied from all nozzles

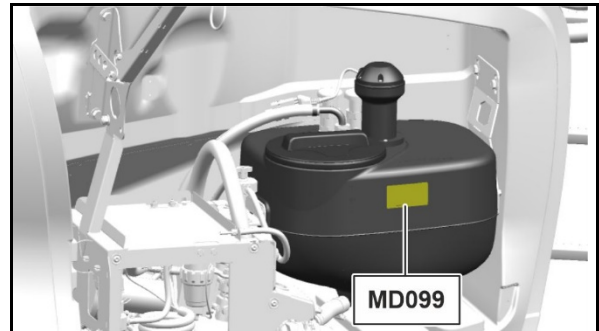


## 1.4 Technical data

Agent tank content	45 l
Delivery volume of the pump	Minimum 30 ml/min Maximum 1180 ml/min

## 1.5 Warning symbols

### 1.5.1 Position of the warning symbols

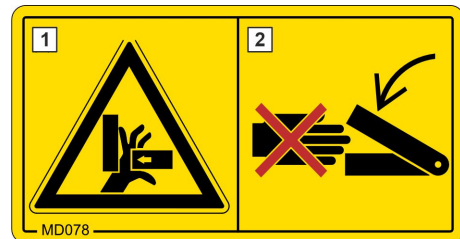


### 1.5.2 Layout of the warning symbols

Warning symbols indicate danger areas on the implement and warn against residual dangers. At these points, there are permanent or unexpected dangers.

A warning symbol consists of two fields:

- Field (1) shows the following:
  - A pictogram depicting the danger area, surrounded by triangular safety symbol
  - The order number
- Field (2) shows a pictogram depicting how to avoid the danger.



### 1.5.3 Description

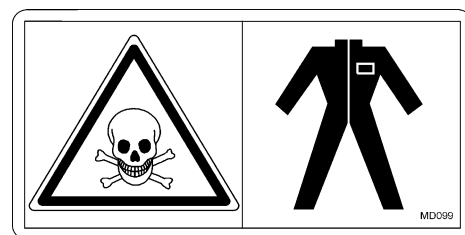
#### MD 099

**Risk of contact with hazardous materials due to improper handling.**

Causes serious, potentially fatal injuries anywhere on the body.

Put on the personal protective equipment.

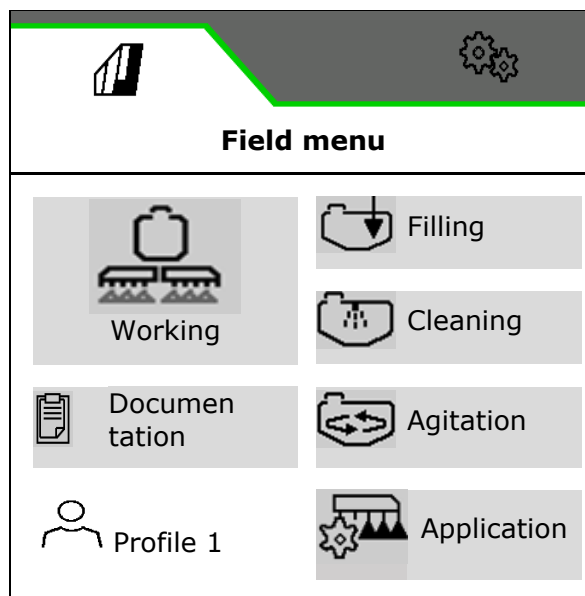
Before coming into contact with hazardous materials, put on protective clothing. Follow the manufacturer's safety instructions for the materials to be processed



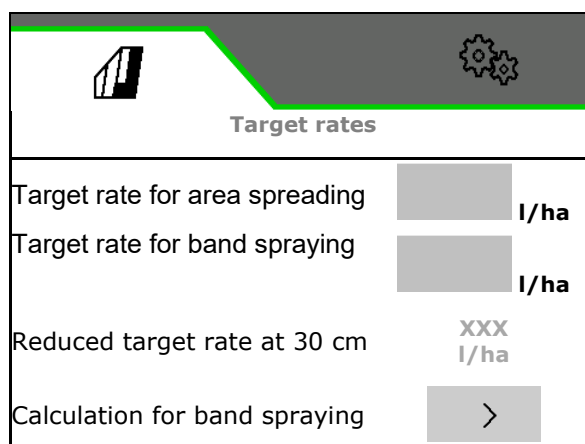
## 2 Setting DirectInject

### 2.1 Start-up and entering the application rate

In the Field menu, select "Application".

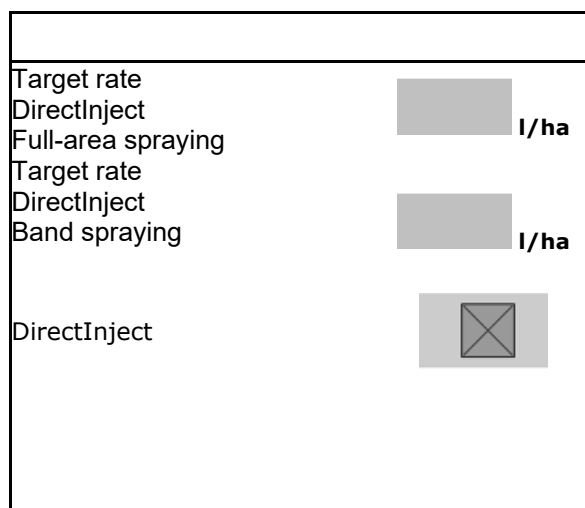


- Target rate for area spraying
- Target rate for band spraying
- Target rate reduced on total area at set band width is displayed.
- Open Band spraying menu





Target rates for DirectInject

- Enter agent target rate in ml/ha for DirectInject area spraying
- Enter target rate for agent in ml/ha for DirectInject band spraying
- Target rate reduced on total area at set band width is displayed.
- Select direct injection
  - ☒ putting into operation
  - or
  - ☐ taking out of operation

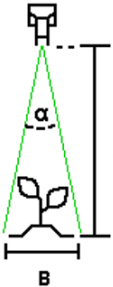


## Calculating band spraying

- Enter desired band width
- The stored nozzle angle will be displayed.
- The spray height to be set is calculated

Calculation for band spraying



Enter the desired band width!

Band width (B)  cm

H Stored nozzle angle **40°**

---

Spray height to be set (H) **41 cm**

## Limits for target rates with DirectInject

The DirectInject pump can convey delivery rates between 30 ml/min and 1180 ml/min.

The constant delivery rate should not be lower than 150 ml/min.

Limit delivery rates lower than 150 ml/min to wedges and headlands.

The table shows the target application rate depending on the delivery rate, speed and working width.

**!** Limit the target application rate so that the delivery rate of the pump is within the operating range of the pump.

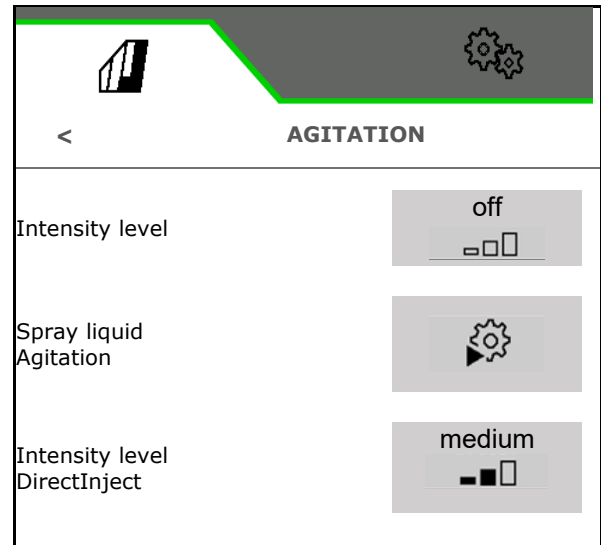
If the minimum target application rate is not reached, dilute the product with another liquid, e.g. water.

Delivery rate [ml/ha]	Speed [km/h]	Working width [m]							
		6	12	18	24	30	36	42	48
100	18	18	36	54	72	90	108	126	144
	15	15	30	45	60	75	90	105	120
	12	12	24	36	48	60	72	84	96
	9	9	18	27	36	45	54	63	72
	6	6	12	18	24	30	36	42	48
	3	3	6	9	12	15	18	21	24
200	18	36	72	108	144	180	216	252	288
	15	30	60	90	120	150	180	210	240
	12	24	48	72	96	120	144	168	192
	9	18	36	54	72	90	108	126	144
	6	12	24	36	48	60	72	84	96
	3	6	12	18	24	30	36	42	48
500	18	90	180	270	360	450	540	630	720
	15	75	150	225	300	375	450	525	600
	12	60	120	180	240	300	360	420	480
	9	45	90	135	180	225	270	315	360
	6	30	60	90	120	150	180	210	240
	3	15	30	45	60	75	90	105	120
1000	18	180	360	540	720	900	1080	1260	1440
	15	150	300	450	600	750	900	1050	1200
	12	120	240	360	480	600	720	840	960
	9	90	180	270	360	450	540	630	720
	6	60	120	180	240	300	360	420	480
	3	30	60	90	120	150	180	210	240
2000	18	360	720	1080	1440	1800	2160	2520	2880
	15	300	600	900	1200	1500	1800	2100	2400
	12	240	480	720	960	1200	1440	1680	1920
	9	180	360	540	720	900	1080	1260	1440
	6	120	240	360	480	600	720	840	960
	3	60	120	180	240	300	360	420	480

Target application rate [ml/ha]

## 2.2 Adjusting the agitator

- Select the DirectInject agitator intensity level.
  - Off
  - Low
  - Medium
  - High



### 3 Using direct injection

**WARNING**

**Field damage due to unwanted application of the DirectInject agent through the spray liquid tank.**

It cannot be avoided that small quantities of the DirectInject agent are flushed into the spray liquid tank.

Take note of this for subsequent treatments without DirectInject.

#### 3.1 Filling the DirectInject agent tank

##### Using pellets

1. Wear personal protective clothing.
2. Dissolve the granules in a separate container before filling into the DirectInject agent tank.



Observe the safety instructions provided by the agent manufacturer!

3. Check that the agents are completely dissolved.



Particles remaining in the liquid can cause system failure and a shorter service life of several components.

## 3.2 Filling the agent tank

! Pay attention to the compatibility of the agents in the DirectInject agent tank with the agent in the spray liquid tank.

! Make sure that the agent has sufficient flowability and can be conveyed by the pump.

Check the volume flow of the pump, see page 23.

1. Wear personal protective clothing.
2. Open the cover hood on the right.

! Make sure that the drain tap is closed.

! Do not contaminate the agent tank. The basket filter must be inserted.

! Fill the tank carefully so that the agent does not overflow.

3. Fill the agent tank through the filling opening.

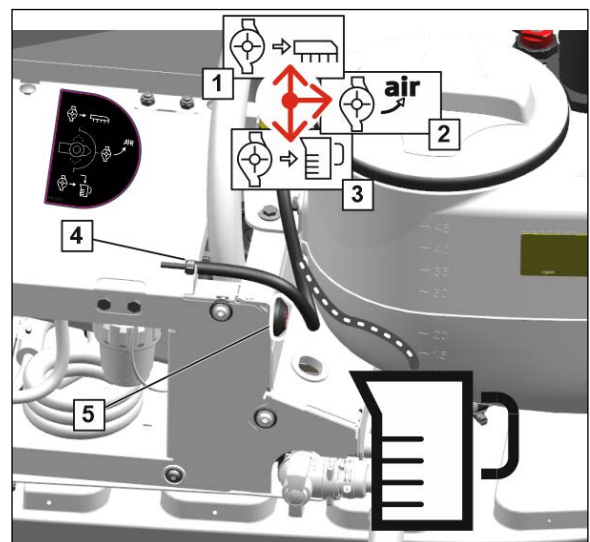
! Only fill in the required quantity of agent. It is preferable to refill if necessary.

→ Maximum tank content: 45 l

4. Vent the DirectInject pump.

Here's how:

- o Switch on the implement so that the pump can deliver.
- o Set the switch tap to the venting position (2)
- o Press the button (5) for 10 seconds.  
→ The pump will be vented.
- o Set the switch tap to the spraying position (1).





5. Clean the canister in the induction bowl.

! Please note that agent residues will be flushed into the spray liquid tank.

See operating manual for the UX field sprayer.


## Using direct injection

- Enter the filled agent quantity in the Filling menu.

FILLING


Enter desired nominal fill level!



Area


Application rate

Nominal fill level



Filling level  
DirectInject

### 3.3 Preparing the direct injection

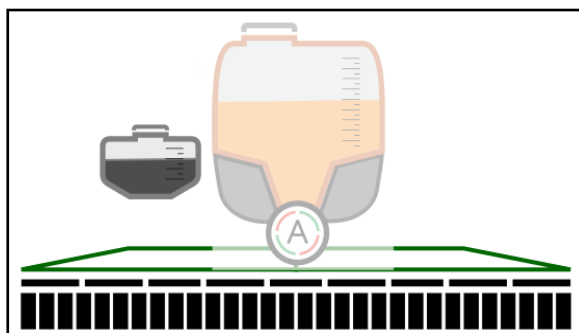
	<b>Preparing the direct injection before operation</b>
---	--

After cleaning, the lines are still filled with flushing water.

Prepare the direct injection on the field with the sprayer boom unfolded.

Spray liquid with agent circulates through the boom and back into the spray liquid tank when the nozzles are closed.

As soon as the liquid in the lines was exchanged, the procedure will stop.



Grey DirectInject tank – implement is not prepared



- Prepare the direct injection,



- Prepare the direct injection.

→ Duration approx. 45 seconds.

→ Orange DirectInject tank – implement is prepared.

The direct injection remains prepared until the DirectInject is pre-cleaned.

### 3.4 Switching the direct injection on / off

	<b>Switching the direct injection on / off</b>
---	--

Prerequisite: direct injection is prepared.

Orange DirectInject tank – implement is prepared



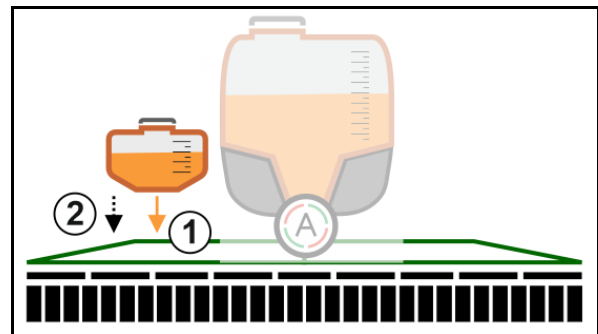
Switch on the direct injection.

→ Agent will be metered.



About 10 seconds after beginning with spraying operation, the DirectInject agent will be applied.

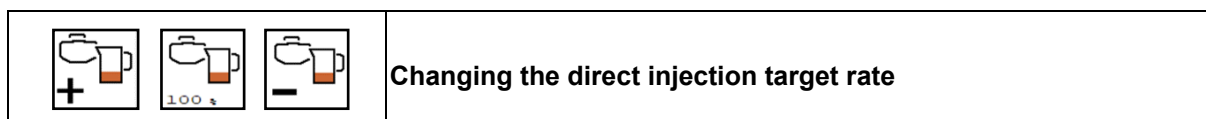
- (1) The direct injection agent is ready for application
- (2) The system needs about 10 more seconds until the DirectInject agent is applied.



When the sprayer is switched off, the direct injection is also interrupted.

When spraying is started again, the direct injection is automatically switched on again.

### 3.5 Changing the direct injection target rate

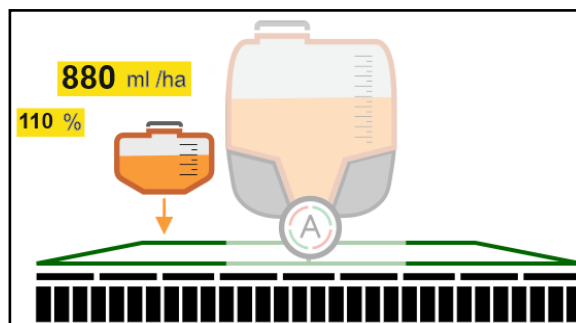


The target rate can be changed during operation.

The changed target rate is marked in yellow in the Work menu:

- Rate in ml/ha, in percent
- Increment 10% (default value)

The response time when changing the target rate for the direct inject agent is about 30 seconds. The target rate display flashes during this time.



The display of the DirectInject agent target rate is also marked in yellow when the target rate for spray liquid is changed.

### 3.6 Emptying the agent tank



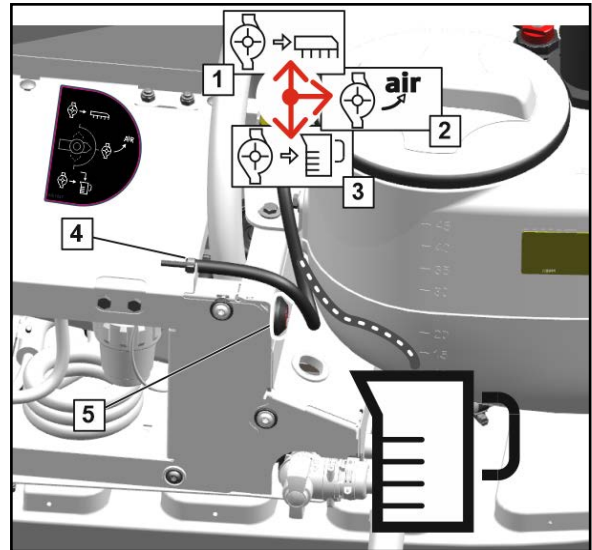
Agent residues contaminate the implement!

Empty the agent tank using the pump:

1. Wear personal protective equipment.
2. Open the cover hood on the right.
3. Set switch tap to the Flushing position (3).
4. Route the hose (4) into a collection bucket.
5. Press the button (5).

→ The agent tank will be emptied.

6. Set switch tap to the Spraying position (1).
7. Close the cover hood on the right.

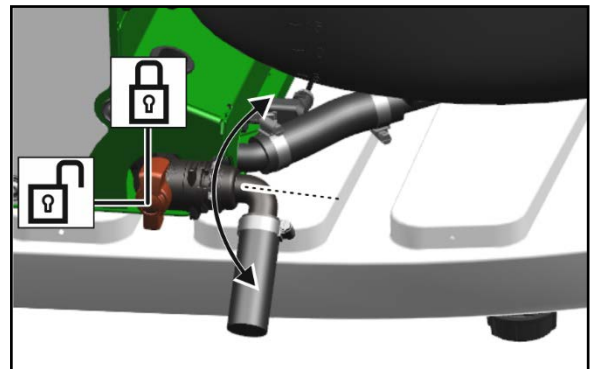


Drain the residual quantity:

1. Wear personal protective equipment.
2. Open the cover hood on the right.
3. Swivel the drain hose down.
4. Place a collection bucket under the drain outlet.
5. Open the stop tap.

→ The agent tank will be emptied.

6. Close the stop tap after emptying.
7. Swivel the drain hose up.
8. Close the cover hood on the right.



### 3.7 Pre-cleaning the direct injection tank

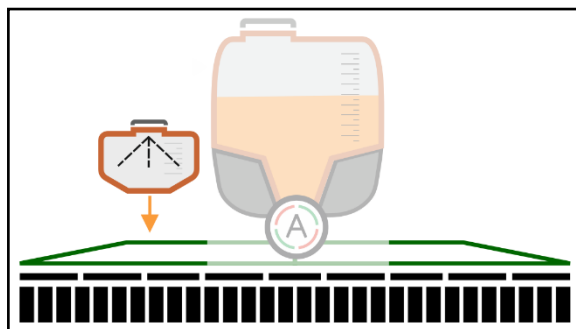


#### Pre-cleaning the direct injection tank

Pre-cleaning is performed with spray liquid through the agitator pump during the spraying procedure.

Minimum fill level in the spray liquid tank: 200 l

The tank for direct injection must be empty.



Agent residues will be conveyed into the spray liquid tank.



1. Pre-clean the tank for the direct injection with spray liquid.



2. Stop the pre-cleaning.

- The cleaning symbol flashes until the pre-cleaning is finished.
- The tank is grey again - not prepared

## 4 Cleaning DirectInject

Intensive cleaning of the entire implement after operation on the field:

- The direct injection pump and lines will also be cleaned.
- ☒ The agent tank is optionally cleaned.

Quick cleaning of the entire implement on the field:

- The direct injection pump and lines are also cleaned.
- ☒ The agent tank is optionally cleaned.

Flushing the boom on the field when interrupting work









- The direct injection lines will be cleaned with flushing water.
- Then the circulation cleaning can be performed with the cleaning water for any period of time.
- The agent tank will not be cleaned.

Flush the direct injection with flushing water if necessary:



- The direct injection pump and lines are also cleaned.
- The agent tank will be cleaned.

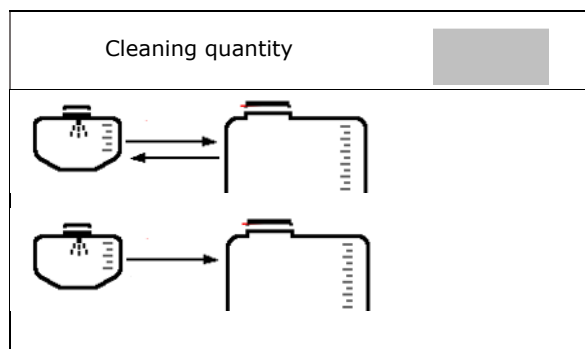
Pre-clean the direct injection with spray liquid, see page 18.

- The direct injection pump and lines are also cleaned.
- The agent tank will be cleaned.

 	
< CLEANING	
	Intensive cleaning
	Quick cleaning
	Flushing the boom
	Dilute
	Flushing DirectInject
	Pre-cleaning DirectInject

## 4.1 Flushing the direct injection with flushing water

1.  Start the flushing of DirectInject
  2. Enter the amount of flushing water that is required for cleaning.
- Cleaning active
3.  Confirm finishing of the cleaning procedure.
- Cleaning finished



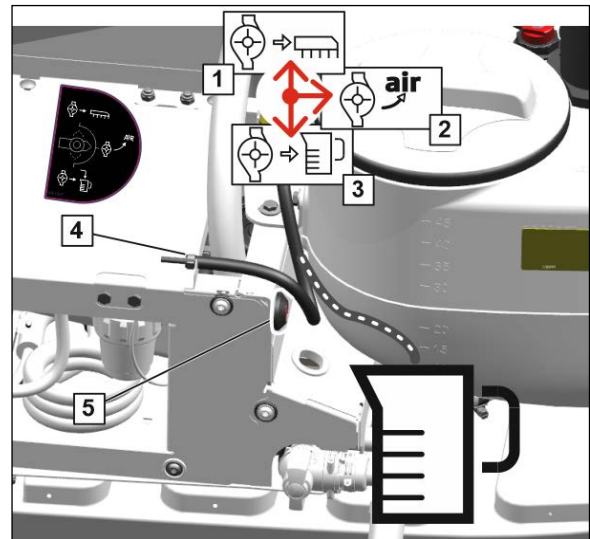
## 5 Changing agents

Before filling a different agent:

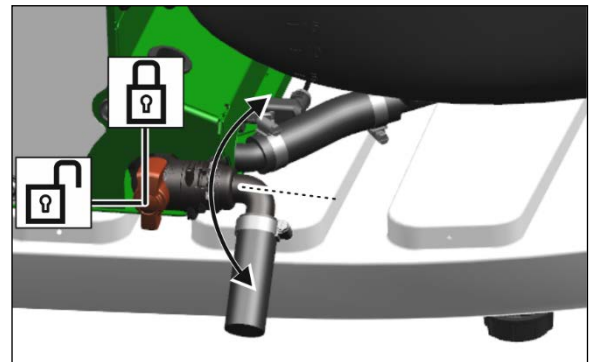
1. Empty the agent tank.
2. Clean the agent tank with the cleaning program, see page 19.
3. Flush the DirectInject pump.
4. Empty the cleaning water with agent residues from the agent tank.
5. Clean the pressure filter.
6. Fill flushing water into the agent tank.
7. Flush the hose (1).

Also:

- o Set the switch tap to the Flushing position (3).
- o Route the hose (4) into a collection bucket.
- o Press the button (5).
- The hose will be flushed.
- o Set the switch tap to the spraying position (1).



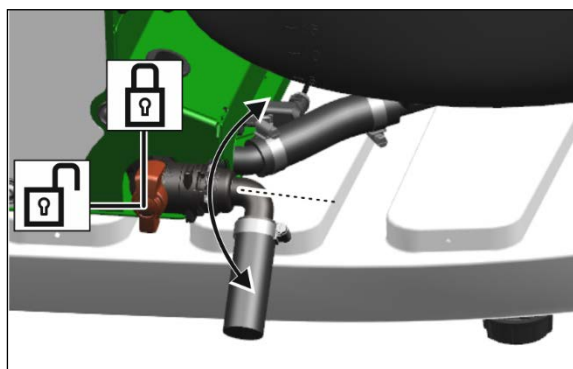
8. Flush the agent tank drain. Open the stop tap for this.



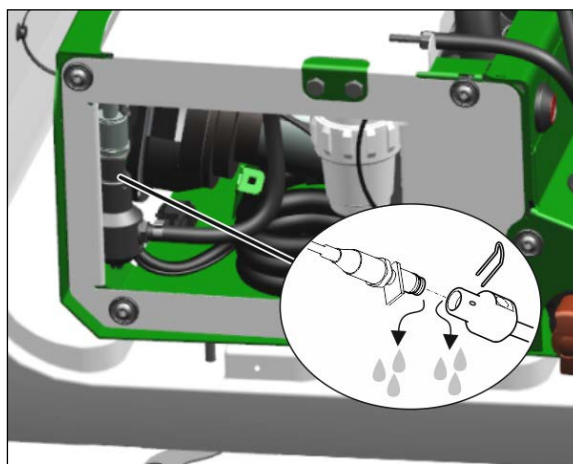
## 6 Maintenance

### 6.1 Winterising with antifreeze

1. Empty the agent tank.
2. Clean the agent tank.
3. Flush the DirectInject pump.
4. Empty the cleaning water with agent residues from the agent tank.
5. Clean the pressure filter.
6. The DirectInject components are protected from frost damage with the winterising function of the TwinTerminal.





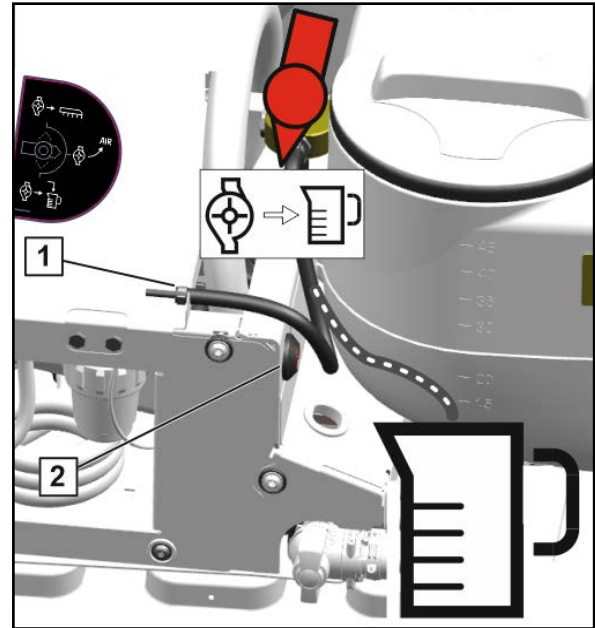
7. Drain the pressure sensor.



## 6.2 Checking the volume flow of the pump

With viscous agents, we recommend that you check the volume flow.

1. Wear personal protective clothing.
  2.  Set the pump switch tap to the Rate control position.
  3. Hold the calibration hose (1) in the measuring cup.
  4. Press the calibration button (2) and measure the time.
  - A defined quantity of 1 litre per minute should be conveyed into the measuring cup.
  5. Release the calibration button after a defined amount of time.
  6. Calculate the volume flow.
  7.  Set the pump switch tap to the Spraying operation position.
  - Dilute the agent if the volume flow of 1 litre per minute is not reached.
- Observe the specifications from the agent manufacturer.



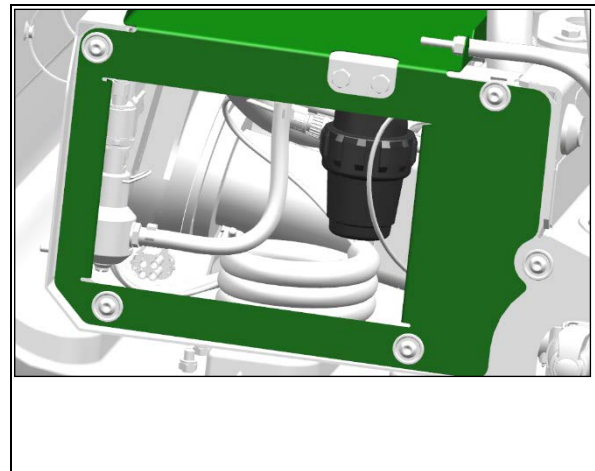
If there is a deviation of more than 20%, there can be contamination in the pump valve. Go to a specialist workshop.

## 6.3 Cleaning the pressure filter of the cleaning nozzle

Every three months / every 250 hours

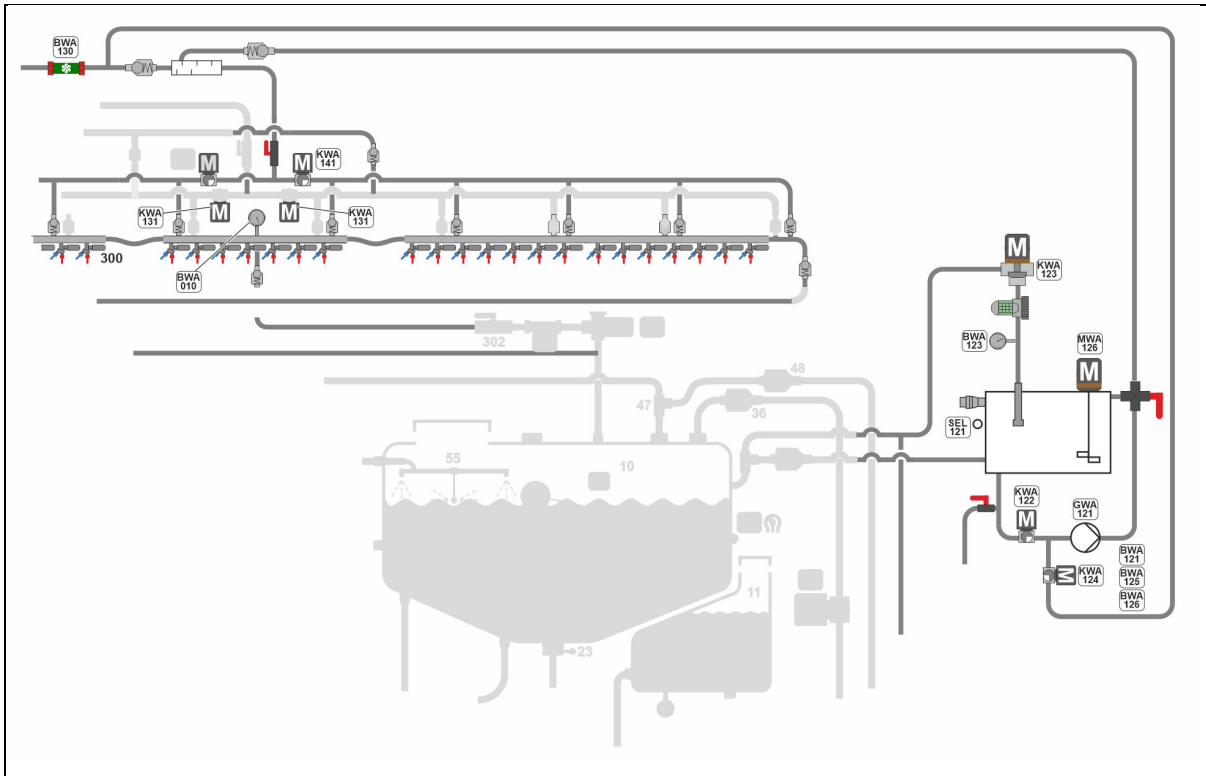


- The pump must not be running.
1. Place a collection bucket under the pressure filter.
  2. Unscrew the pressure filter.
  3. Clean the pressure filter insert.
  4. Grease the O-rings.
  5. When installing the pressure filter, make sure that the O-rings are correctly seated.
  6. Dispose of the collected liquids.



## 7 Appendix

### 7.1 Liquid circuit





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