

Information leaflet for Wiesel hail protection systems

General

Hail protection systems are used to protect plants and crops in fruit-growing, wine-growing, open-field market gardening and many other specialist areas of cultivation. The materials used within the system are exposed to various stresses and strains as a result of environmental influences (such as hail, wind, water, snow, sunshine, and so on), and can be damaged by crop care and harvesting equipment. Wiesel hail protection systems are designed to withstand the effects of the weather up to a maximum wind speed of 100 km/h. During hailstorms, the connector clip provides protection against overload. The maximum load is 60 kg for the Wiesel standard connector clip and 70 kg for the Wiesel flat connector clip.

Fruit Security GmbH assumes no liability for loss or damage resulting from overload. The customer must take out residual risk insurance to cover any such loss or damage. The system is not designed for snow or ice loads (frost protection irrigation). It is absolutely essential to put the hail net into the winter storage position before the first snowfall. The net must not be moved into the summer position too early on during the spring.

Technical description

The characteristic feature of Wiesel hail protection systems is the way the cross wire (cross rope) is guided above the hail net. The nets are hung from the start to the end of the row so that they run over the ridge wire to the relevant front rope. The nets are connected to each other in the centre of the machine track using our Wiesel mod.13 standard connector clips or Wiesel flat connector clips, which are attached to the reinforced net edge.

One of the key features of the system is that the ridge wire, the hail net and the cross wire/cross rope are all jointly secured at a single point: the Firstfix ridge anchorage at the head of the column.

Arranging the cross wire so that it runs above the hail net has several advantages:

- 1) From a structural perspective, the highest point is the optimum fastening location.
- 2) The nets are free to droop into the machine track, which is more conducive to emptying out any hail.
- 3) Barrier-free access for machinery, such as tree pruning machinery

It is absolutely essential to take note of the following essential points before setting up the system:

On sloping sites, you should endeavour to arrange the rows so that they run downward in the direction of the slope (for structural reasons).

If the production conditions are such that the rows have to be arranged crossways to the slope, considerably higher system loads are to be expected as a result of hail because of the increased difficulty of emptying the net. In this case, the loads must be countered structurally by placing the columns closer together and using reinforced anchor solutions.

The column height must be calculated on the following basis: the desired crop height plus the additional growth allowance between the crop and the hail net plus at least 60 cm (in the ground).

Anchor distances/turn space: At the planning stage, it is absolutely essential to factor in the necessary anchor distances. The anchor distances are dependent on the column height. With a construction height of up to 3 m, a distance of at least 2 m must be observed at the front (in line with the running of the rows) and at the edges. If the construction height exceeds 4 m, a minimum anchor distance of 3 m must be observed. It is very important to start by positioning the anchor in accordance with the turn space required. Only then should you set up the front columns. In this way, you will avoid dangerous compromises with regard to the anchor distance and/or turn space. Lines running crossways must be at an angle of 90° in relation to the row direction or must be arranged in accordance with the system design.

Once the desired system height and column type have been selected during planning, you can determine the column length. The column length is the length below ground plus the system height. The length below ground is dependent on the soil profile and the size of the column. A depth of 0.6 m can be taken as a rough guide value.

The column can be set up by pushing it directly into the ground with an excavator or similar piece of equipment. In the case of highly compact soil, a hole must be created in advance using a hole making tool or a hole must be dug out. When using an excavator, it is important to look in the direction of the row and also in the direction of the cross stabilisation to ensure that the columns are all in perfect alignment with each other. Minor deviations of up to approximately 10 cm at the tip of the column can be compensated subsequently when anchoring the column.

Anti-sinking plates: The plates must be installed on solid subsoil (at least 15 cm below the surface of the ground). The plates must lie flat against the column on both sides. Initially, the bolts should only be tightened moderately and driven into the ground with a heavy hammer. Only then should the bolts be tightened to a torque of **110 Nm**.

Anchors: The anchors must be matched to the soil conditions to ensure adequate anchoring. The anchors must be able to withstand a load of at least 3 tonnes. To achieve this minimum value, the correct anchor type must be selected for the relevant soil conditions.

Attention! With small anchor distances, there is a massive increase in pressure on the front and edge columns. The plate size, clamping mechanism, column size and anchor capacity must be increased in accordance with the possible anchor distance. In principle, we advise against this. It should only be done in exceptional cases.

Guide to selecting the appropriate anchor for the type of soil concerned:

- Stony hard gravel soil = impact anchor
- Compact mixed soil = screw anchor with 25 cm dia. plate
- Normal soil = screw anchor with 30 cm dia. plate
- Sandy soil = Torpedo or screw anchor with 40 cm dia. plate
- Peat soil = screw anchor with 50 cm or 60 cm dia. plate

When installing anchors, care must be taken to ensure that the column head, column foot and anchor are all aligned in the direction of cable/wire tension. The anchor must be at least 2 m away from the foot of the column (see table in data sheet). Any distances shorter than this are compromise solutions and carry a certain amount of risk.

All anchors must be tested for a load of at least 3 t in the direction of tension with an appropriate anchor distance. If compromise solutions prove necessary, the demand placed on the anchor may increase to +/- 6 t.

Selecting the net type and colour: The net is made from interwoven polyethylene threads with a thickness of 0.32 mm. The quality and thickness of the thread are critical for the life of the system as a whole. The thread can be produced in various colours, with black and clear (the latter looks white) having established themselves as the main colours used in practice. When these two colours are interwoven, it results in a grey appearance. In principle, the advantage of nets woven from clear threads is that they allow more light to pass through. This can be particularly beneficial for red apple varieties, as it helps them to develop their colour. The disadvantages are the much shorter life due to the lower UV-resistance of the threads and the greater risk of crop sunburn compared to a black net.

Connector clip: The connector clip is the connecting component between two net sections. The connector clip must be positioned in accordance with the instructions from Fruit Security. Depending on the width of the crop rows, the connector clips must be spaced 1.20 to 1.50 m apart at the densely woven edge of the net. Particular care must be taken to ensure that the male and female connectors are always attached on the same side of the row and are exactly parallel. Care must also be taken to observe a connector clip distance of at least 60 cm to the left and right of each edge column and inner column.

The Wiesel system is constructed using Wiesel mod. 13 connector clips as standard. If Wiesel flat connector clips are used, please be aware that there is an increased risk of scatter damage. Therefore, we recommend that you only use the flat connector clip in conjunction with scatter damage protection, the installation of which can be ordered separately.

It is absolutely essential to plan the system properly before setting it up and putting it into operation.

All the information has been formulated in a general way and only applies if the system is used correctly for its intended purpose and is regularly maintained in accordance with the instructions and specifications of Fruit Security. The information leaflet does not constitute a set of installation instructions for your specific system. Depending on which version of the system you have, different installation and operating procedures and different values may apply in individual cases.

If anything is unclear, please contact Fruit Security.