



Dealing with windblown trees

Do you also give thought to your safety and your health when dealing with windblown trees?

This brochure is intended for people who have to deal with windblown trees. Our aim is to

- Make you aware of the particular dangers involved in dealing with windblown trees
- Encourage you to think about your own capabilities and limitations
- Inform you about safety rules and measures

We have intentionally dispensed with descriptions of working and cutting techniques. These are best learnt in practical courses. Every windblown-tree situation is different and requires an individual approach. Only when taught by a qualified instructor will you learn how to assess a specific situation correctly and how to apply the safest working and cutting techniques.

This brochure is no substitute for minimum basic training nor can it be considered to be a comprehensive training document. It is no substitute for practical, on-the-job training.

Warning
Dealing with windblown trees
is hazardous without the appropriate
training, equipment and work
preparation!

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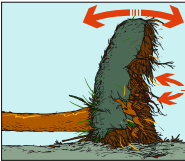

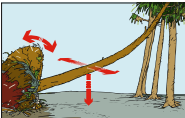


1 Dealing with windblown trees: A job involving particular hazards!

There are many complex hazards in storm-affected forests with thrown, uprooted, broken, heavily leaning and hung-up trees or parts of trees:

- Impassable and obstructed roads and routes, reduced accessibility and visibility
- Incalculable tension and forces both in individual trees as well as in jammed stems and root plates
- Unstable trees, parts of trees, root plates and stones that can suddenly topple, tip over, fall or roll away without any visible reason even days, weeks or months after a storm.



Dealing with windblown trees involves particular hazards. A look at the accident statistics reveals the following main points

Activity	Hazards	
Severing trees from their root plates	<ul style="list-style-type: none"> • Being crushed by a toppling, turning or rolling root plate • Being struck by a stem kicking sideways • Getting caught by a splitting stem • Getting trapped and crushed between stems 	
Felling heavily leaning trees	<ul style="list-style-type: none"> • Getting struck by a splitting stem • Getting struck by a falling part of the stem 	
Bringing down hung-up trees or parts of the crown	<ul style="list-style-type: none"> • Getting struck by a tree or root plate that moves unexpectedly • Getting struck by part of the crown that breaks off and falls 	
Bringing down a tree with a broken crown touching the ground	<ul style="list-style-type: none"> • Getting struck by the stem or part of the crown that breaks off and falls 	
Felling the remains of a tree without a crown	<ul style="list-style-type: none"> • Getting struck by remains of trees that bounce up or kick sideways or backwards when they hit the ground 	

The risk of accidents is substantially reduced if windblown trees are dealt with using the appropriate machines and aids – for example with harvesters and vehicles equipped with grapple cranes.

2 Is your «life insurance» TOP?

Take precautions to meet the particular hazards involved in dealing with windblown trees.
The main points are:

Technique

- All the tools and machines required for «normal» wood harvesting jobs – including spare parts and working aids – must be available in working order at the work area.
- **Additionally, suitable extraction equipment is needed to deal with windblown trees safely.**
- Winches and forestry vehicles must comply with state-of-the-art safety technology.
- The appropriate personal protective equipment must always be worn.
- Material must be available to keep people out of the work area and access routes (folding hazard signs, fencing material, etc.).
- A shelter should be available close to the working area (e.g. a mobile shelter hut with facilities for cooking, heating and keeping food).



Organization

Ask yourself the following questions before starting work:

- How am I going to proceed?
- What jobs have to be done?
- In what sequence do they have to be done?
- Who is going to do what ?
- Who am I working with? (Never work alone!)
- What equipment do I need?
- What safety measures should be taken?
- Am I sufficiently equipped and prepared if an accident occurs?
- How am I insured against accidents?
- Is my liability insurance adequate?



Persons

The following preconditions are essential when dealing with windblown trees:

- Minimum basic training (e.g. wood harvesting course: 10 days, including the felling of «difficult» trees)
- Several years' practical experience of tree-felling
- Practical training in dealing with windblown trees on-site (in your own forest or centrally organized)

For information on tree-felling courses:

- **Swiss Forest Owners Association (WVS), Solothurn, Tel. 032 625 88 00**
- **www.holzerkurs.ch**

Please apply to:

- **Cantonal forestry departments (training section)**

Take a self-assessment test:

Do you know how to deal with windblown trees?

	Yes	No
T echnique (equipment)	<input type="checkbox"/>	<input type="checkbox"/>
O rganization (preparing for work)	<input type="checkbox"/>	<input type="checkbox"/>
P ersons (training)	<input type="checkbox"/>	<input type="checkbox"/>

You may only consider yourself capable of dealing with windblown trees if you can answer «**yes**» to all three questions!

3 Managers: Adapt your safety concepts

Adapt your forestry safety concept to meet an exceptional situation and implement it consistently:

Safety goals

- Safety is paramount!
- No lost working hours due to accidents

Training and further training

- Only entrust well-trained employees with the task of dealing with windblown trees.
- Carry out practical training on how to deal with wind-blown trees with all employees on-site.

Working conditions

- For reasons of health protection, dispense with any additional work or extended working hours.
- Release employees regularly from clearing operations, give them another activity or deliberately allow them a day off.

Co-operation with outside firms

- Try to co-operate with outside firms; borrow employees from outside firms.
- Give preference to firms and operations that have already implemented a safety concept.
- Ask for proof of accident and third-party liability insurance.
- Insist on the use of trained personnel (minimum basic training, experience, practical training).
- Establish a work contract on the style and scope of the work as well as responsibilities (e.g. regarding contact partner, blocking of traffic routes, etc.).

Safety inspections

- Carry out regular safety inspections – despite the fact that work is done under time pressure. A lot needs to be improved at the start of the clearing operation. Later on, there is a danger of carelessness resulting from routine.

Internal communication

- Give personnel more information (what, where, when, who, how much, why, etc.).
- Hold discussions in the team, listen to employees' concerns and suggestions.
- Respond to employees' feelings and emotions, review them together.

4 Are you equipped for an emergency?

An undesirable incident – an accident, an insect bite, an acute attack of illness – can affect anyone. Undesirable consequences can often be avoided by taking swift and appropriate action. Therefore:

Never work alone!

Be prepared to call help:

- Complete an emergency card (Suva order number 88217/1)
 - Note down important telephone numbers
 - Determine the coordinates of the nearest usable road to the work area
 - Determine the meeting point for rescuers
- Have your mobile phone and radio ready

Before starting work, check that:

- You are carrying a pocket first-aid set
- Your first-aid kit is at the work area
- Your alarm system (mobile phone, Rega emergency radio) is ready and that reception has been tested
- You have your updated emergency aid card with you
- First-aid measures are known

In the event of an emergency:

- Keep calm!
- Get a clear picture of what has happened
 - What has happened exactly?
 - Injured persons, material damage?
- Assess
 - Danger to rescuers (e.g. from falling branches or parts of the crown, toppling root plates, falling rocks)?
- Take action
 - Protect yourself
 - Get any accident victims out of the danger area
 - Assess the condition of accident victims
- Call for help (emergency call)
- Apply first aid (life-preserving, on-the-spot measures)



5 Warning: Do not expose third parties to risk!

Areas of windblown trees often attract spectators. These third parties must not be exposed to danger when work is done in windblown areas.

Dependent on the situation, it may be a good idea for the local forestry service to issue a limited order prohibiting people from entering a forest with windblown trees.

In the vicinity of public traffic areas, the warning arrangements and measures taken to block off areas must satisfy the Road Traffic Act (RTA), the regulations governing signposting and local implementation rules. Forest trails and tracks and hiking routes that are not for exclusively private use are considered to be public traffic areas.



6 Windblown forest areas: The correct approach

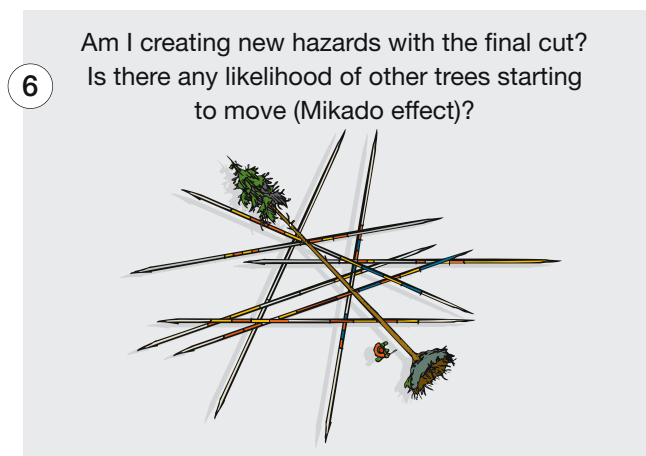
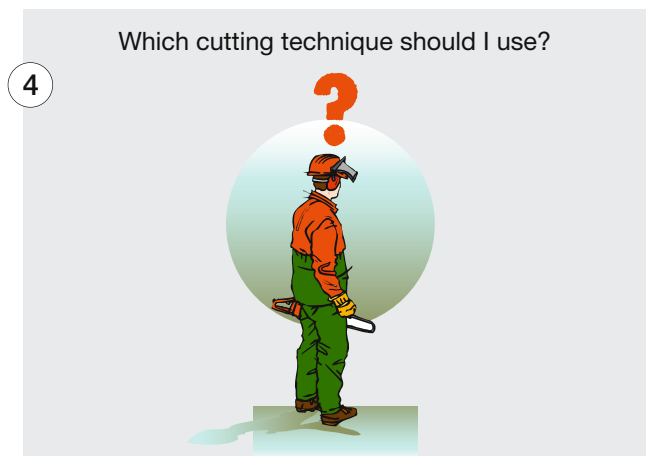
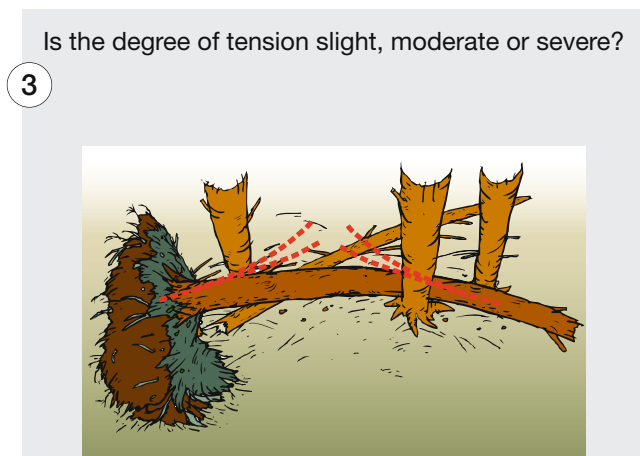
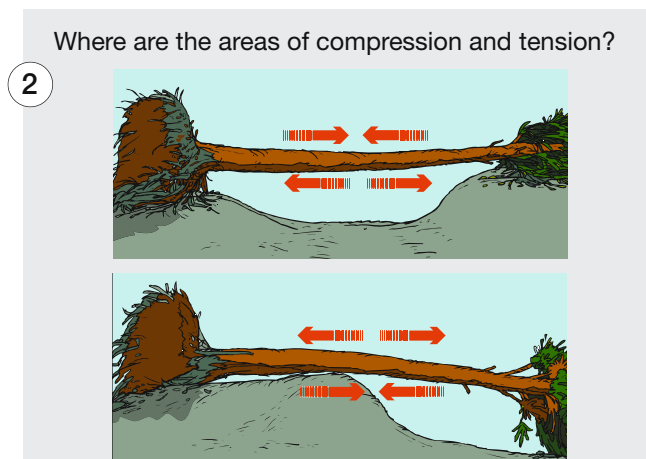
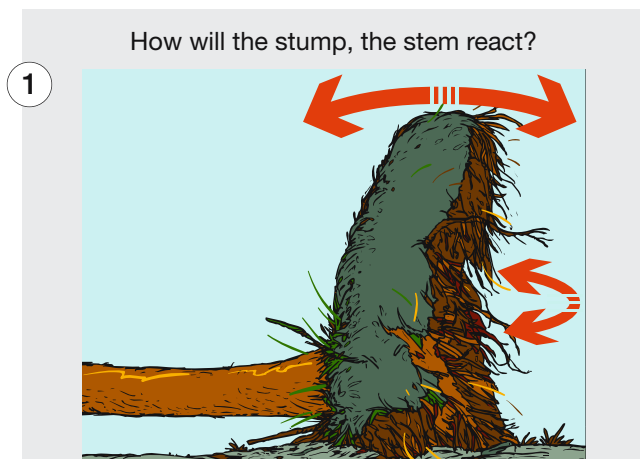
The following principles must be observed in particular when dealing with windblown trees:

- Start work generally in the trees' direction of fall and from the side.
- Only do as much work as is necessary in the damaged area:
 - first eliminate dangers from above (fell unstable, heavily leaning and hung-up trees)
 - then clear lying trees and
 - finally fell the remains of trees without crowns
- Pull out and haul away trees on a continuous basis using a vehicle equipped with a grapple crane, a winch or a cable crane.
- Debranch trees in a safe place:
 - at an ergonomically appropriate workplace (posture)
 - using machines wherever possible



7 Before every cut: Reassess the situation

Ask yourself the following questions before every cut:



8 Tension: Beware of the hazards – your life could be at risk!

Trees under tension are extremely hazardous:

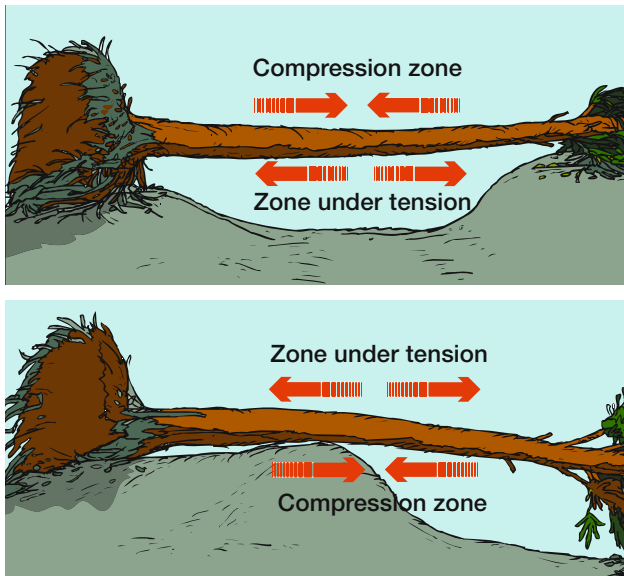
When a cut is made, a tree under tension can suddenly

- kick sideways or upwards
- split

If this happens, the chainsaw operator can be struck,

thrown to one side, crushed or jammed between adjacent stems.





Recommended procedure:

- Thoroughly assess the working situation, the stump, the stems.
 - Where are there any areas under compression and tension?
 - Choose the safest working method and the safest cutting technique.
- Stand on the «safe» side.
- Take up a safe working stance.
- Make your saw cuts carefully and attentively.
- Watch how the cut and the stem react.
- Use a stem press in difficult cases.

An authorised instructor is the best person to teach you which cutting technique is safest in what situation.



Recommended procedure in easily accessible terrain:

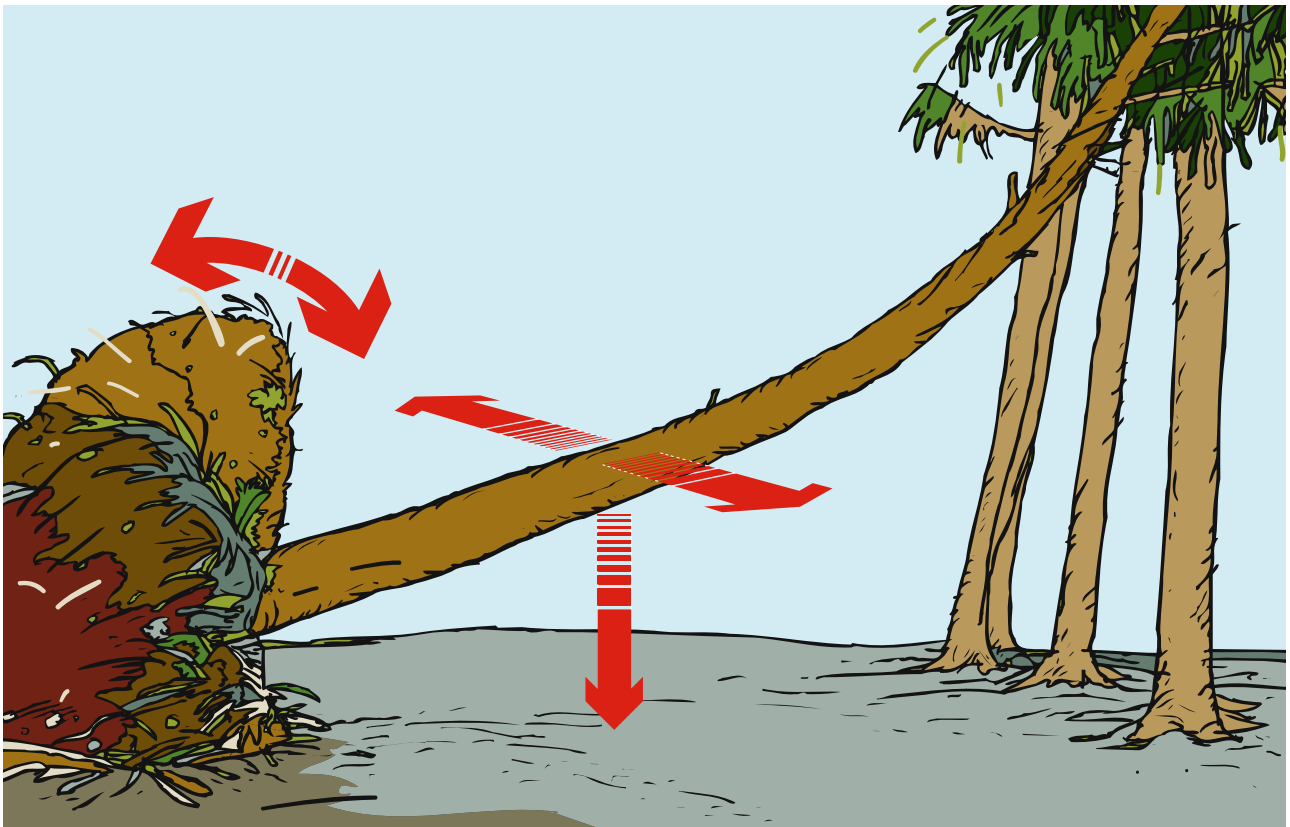
- Use a crane with a grapple.
- Ensure that all those involved can communicate with each other (machine operator, chainsaw operator, other persons).
- Keep out of the crane's danger zones.



9 Bringing down hung-up trees

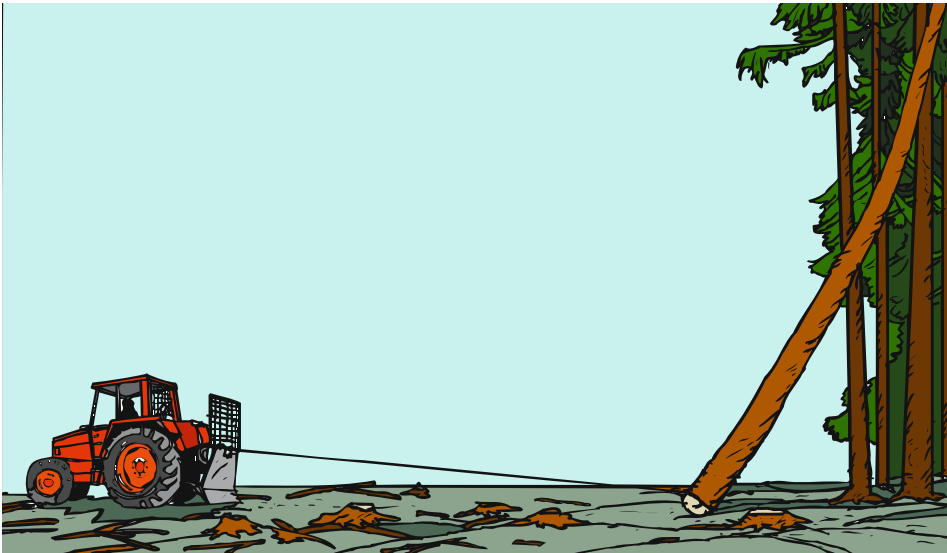
Points you must consider:

- What will happen when a hung-up tree falls down?
 - Will the whole tree fall with its crown?
 - Will parts of the crown or branches fall separately?
 - How will the supporting tree react?
- After the final cut
 - How will the root plate react?
 - How will the hung-up tree react?

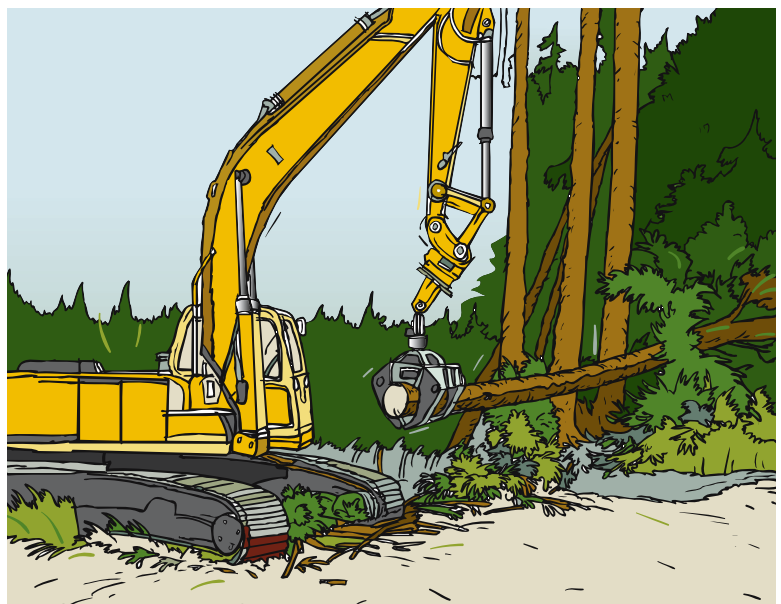


Recommended procedure with the usual equipment:

- Assess the tree and its surrounding area, particularly
 - the area in tension and under compression
 - the crown
- Choose the safest working method (cutting technique, working aids)
- Sever the stem from the root plate
- Pull down the tree using a winch or a cable crane
 - Only from a safe distance
 - With due care for hazardous areas such as the bight of a cable, tensioned and moving cables



Hung-up trees can be brought down swiftly and safely using the appropriate equipment.



10 Bringing down a tree with a broken crown touching the ground

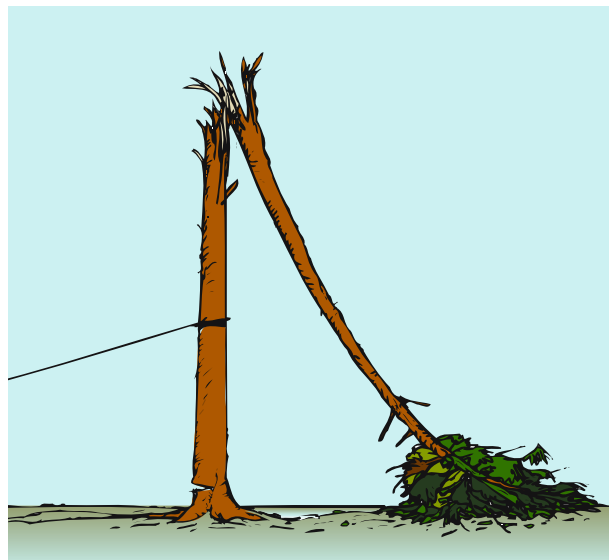
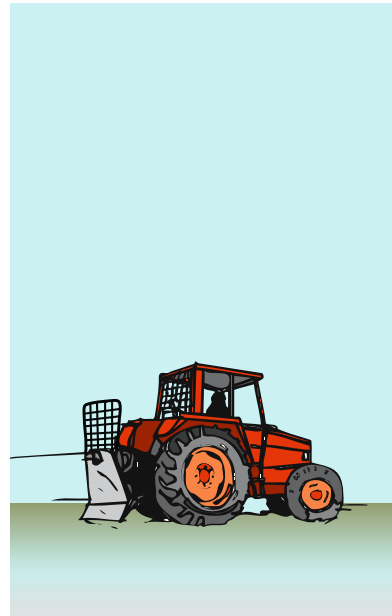
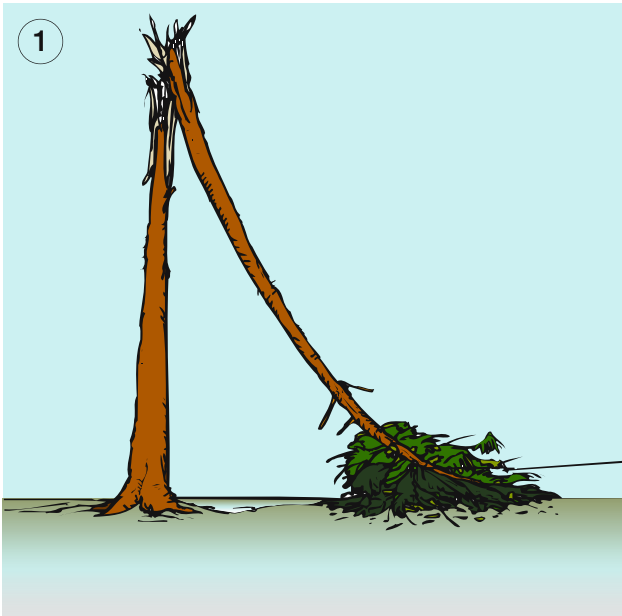
Points you must consider:

- What will happen when bringing down a tree with a broken crown?
 - Will the tree fall to the ground with its crown?
 - How will the tree stump react?



Recommended procedure with the usual equipment:

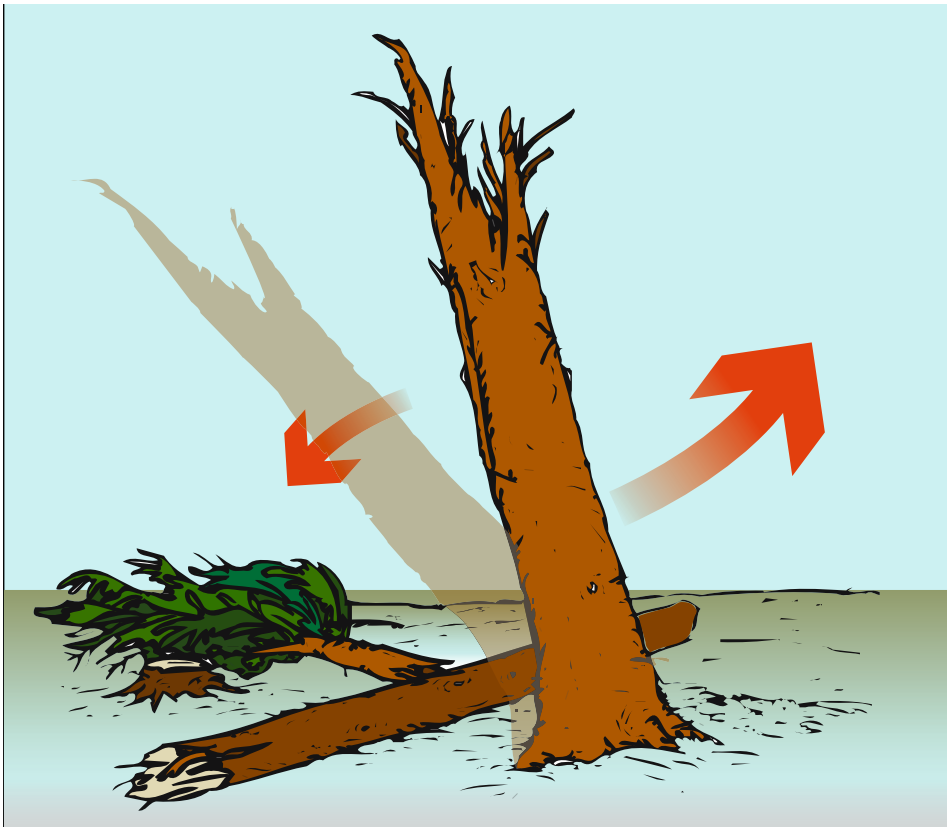
- Thoroughly assess the tree and the point of breakage in particular
- Choose the safest working method
 - First pull down the crown with a winch ①
 - Fell the remaining part of the tree
 - If firmly connected at the point of breakage
 - Fell the tree sideways
 - Cut the tree in the direction of compression if it is the only way and bring the tree down using a winch ②



11 Felling the remains of a tree without a crown

Points you must consider:

- Any obstructions in the direction in which the remaining part of the tree is being felled?
- Reaction of the remaining part of the tree when it strikes the ground?
- Safe stance adopted by the power-saw user?



Recommended procedure:

- Decide on and clear the way to a place of refuge.
- Do not fell the remaining part of the tree over other stems or other obstructions if possible.
- Move to a place of refuge while the stem falls.
- If necessary: Use a stem press



Felling the remaining parts of trees with a harvester will prevent them from bouncing up and kicking back.



12 Felling heavily leaning trees

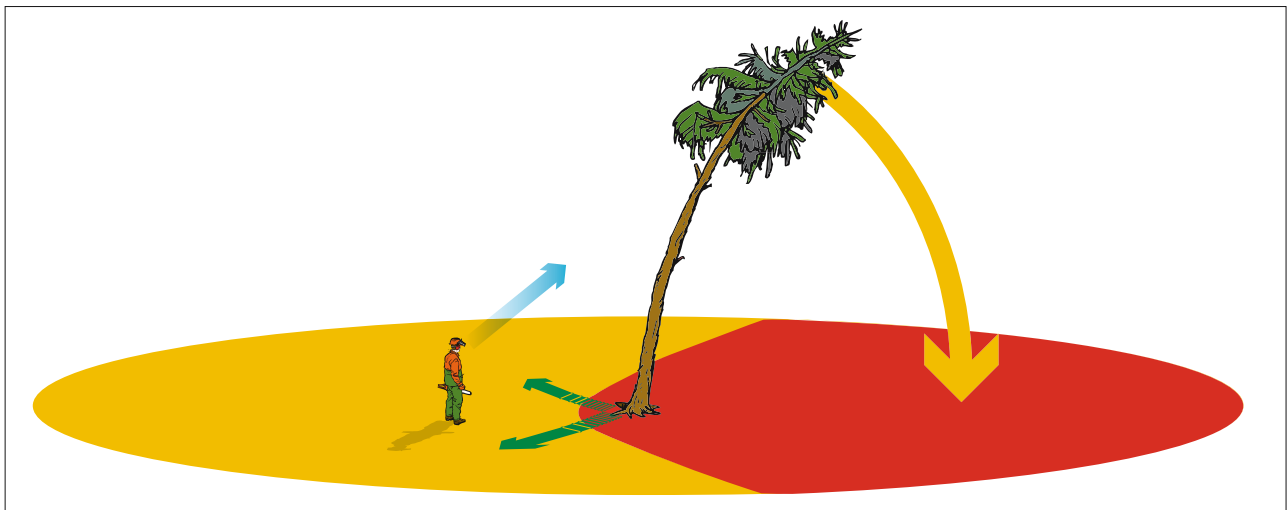
A point you must consider:

- How can the stem be prevented from splitting during felling?



Recommended procedure when felling with a chainsaw:

- Assess the tree and its surrounding area, in particular, the areas of compression and tension.
- Select the safest way to fell it.
- Consider whether a stem press should be used.
- Decide on a place of refuge.
- Decide on and clear the escape route.



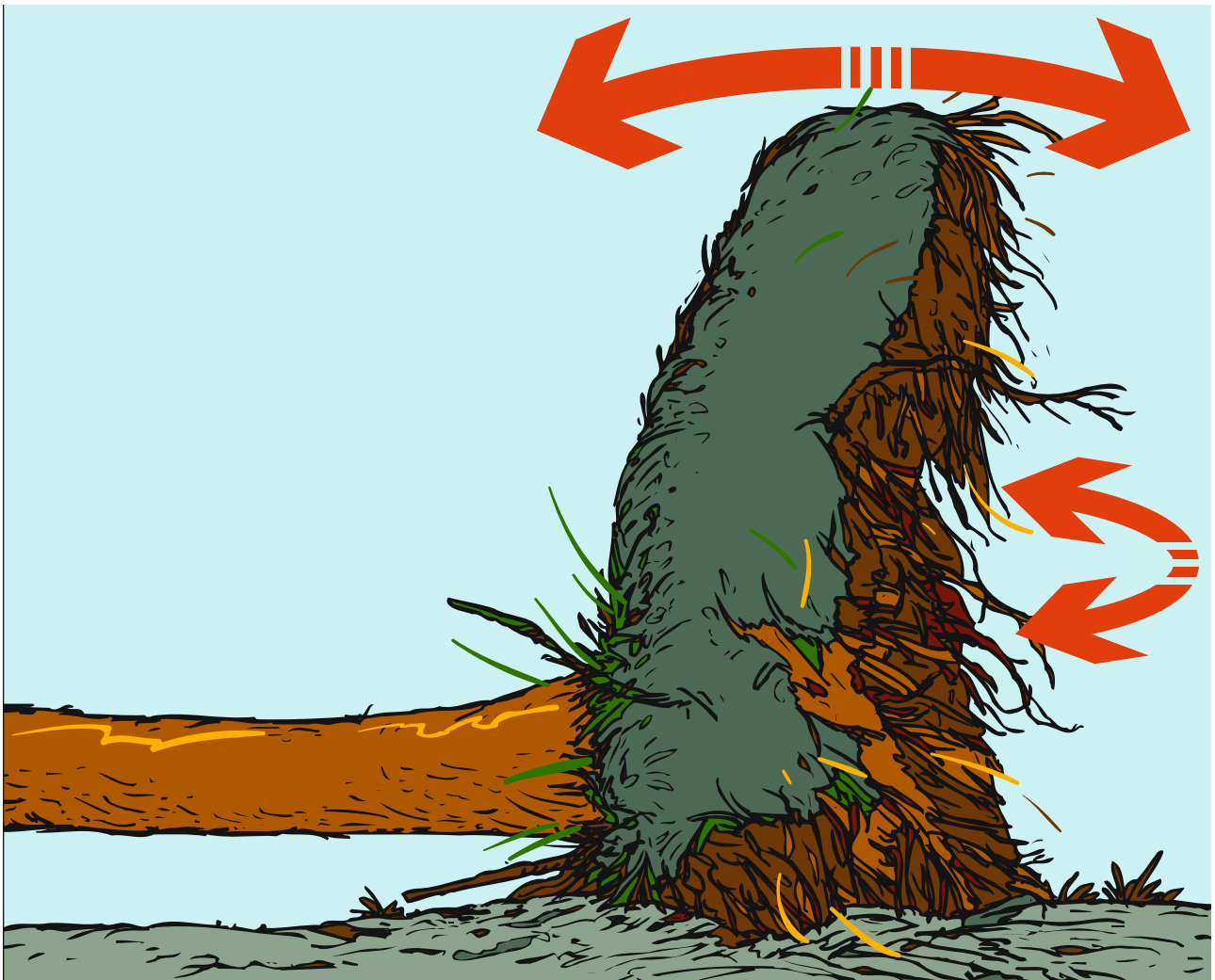
Where circumstances allow (small-diameter trees, terrain practicable), the use of fully mechanised tree-felling machines can prevent stems from splitting.



13 Severing trees from their root plates

Points you must consider:

- How will the root plate react during and after the final cut?
 - Will it topple forward or fall backwards?
 - Will it turn to one side?
 - Will it roll away: e.g. in the falling line, sideways, in the direction of a building, in the direction of a road located at a lower level?
- How will the stem react during and after the final cut?
 - Will it kick back: to one side, upwards?
 - Will it split?
- What else could happen? Is there any likelihood of a «Mikado effect»?
 - Will other stems move?
 - Will other root plates move?



Recommended procedure:

The root plate will fall back into the ground:

- Where are areas under tension and compression?
- Assess the surrounding area: nobody must be allowed to stand behind the root plate!
- Stand on the «safe» side.
- Take up a safe working stance.
- Make the final cut and, at the same time, keep an eye on the cut, the stem and the root plate.



The root plate will probably fall forward or sideways:

- Which areas are under tension and compression?
- Stand on the «safe» side.
- Take up a safe working stance.
- Make the final cut at an adequate distance from the root plate and, at the same time, keep an eye on the cut and the root plate.
- Bring the root plate into a safe, final position if possible (pull it over or move it back from a safe distance).



14 Publications

Suva and EKAS (Swiss Coordinating Committee for Occupational Safety) publications

2134.d	EKAS-Richtlinie Waldarbeiten
44005.d	Sicherheit beim Holztransport mit Helikopter: Regeln für Flughelfer und Forstpersonal
44011.d	Unfallgefahren und Sicherheitsregeln beim Fällen von Bäumen
44051.d	Vorsicht bei Zeckenstich
44064.d	Baum- und Umgebungsbeurteilung. Damit Sie die sicherste Fällmethode wählen.
44069.e	Be a «professional» in your own woodlot (Only available as a download)
55029.d	Obligatorische Schutzausrüstung für Motorsägeführer (Kleinplakat A4)
67014.d	Checkliste «Rolltischkreissäge für das Einschneiden von Brennholz»
67033.d	Checkliste «Arbeiten mit der Motorsäge»
67060.d	Checkliste «Keilspaltmaschine für das Spalten von Brennholz»
67061.d	Checkliste «Notfallplanung für nicht ortsfeste Arbeitsplätze»
67069.d	Checkliste «Wippkreissäge für das Einschneiden von Brennholz»
67096.d	Checkliste «Schraubenspaltmaschinen für das Spalten von Brennholz»
67118.d	Checkliste «Rücken von Holz mit Seilwinde und Fahrzeug»
67124.d	Checkliste «Arbeitsvorbereitung (AVOR)»
67155.d	Checkliste «Buschholzhacker»
84034.d	Die 10 wichtigsten Verhaltensregeln für Fällarbeiten
88067.d	Sicherheit bei der Waldarbeit. Testen Sie Ihr Wissen!
88076.d	Persönliche Schutzausrüstung für das Forstpersonal (Kostenbeispiel) nur als PDF verfügbar

88216.d Arbeitsauftrag und Notfallorganisation im Forst

88217/1.d Notfallkarte

88234.d FALTI – ein Hilfsmittel zur Gefährdungsbeurteilung in der Grundausbildung

These publications can be ordered from:

Suva

Kundendienst, Postfach, 6002 Luzern

Fax 041 419 59 17, Telefon 041 419 58 51,

www.suva.ch/waswo

DVD **Windblown trees** (49 mins.)

- Danger
- Dealing with windblown trees

This DVD can be purchased from:





Waldwirtschaft Verband Schweiz (WVS)

P.O. Box, CH-4501 Solothurn

Fax 032 625 88 89, Tel. 032 625 88 00

info@wvs.ch, www.wvs.ch

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