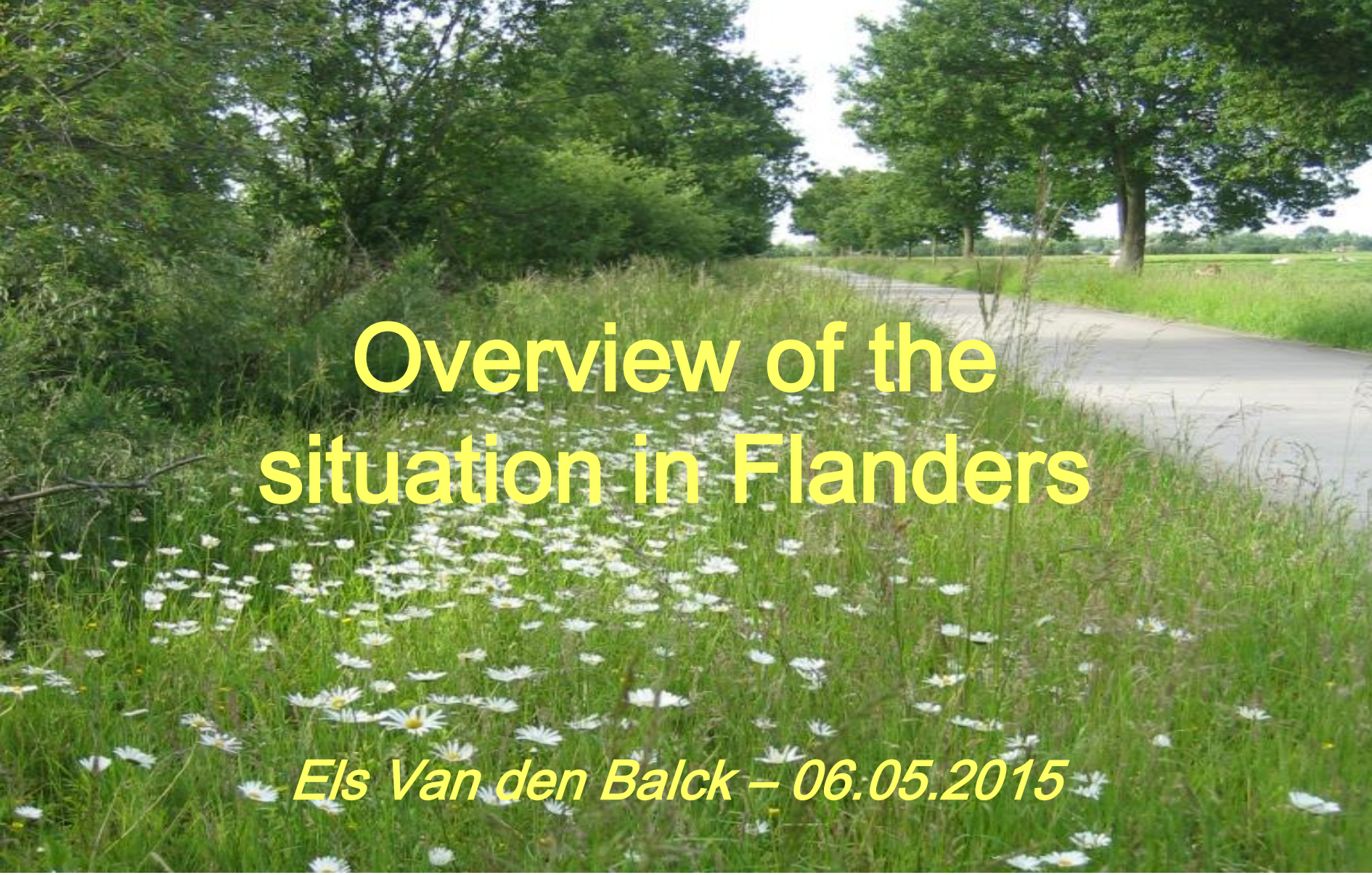


Overview of the situation in Flanders

Els Van den Balck – 06.05.2015

General goals and benefits

Safety

- ✓ Increased visibility and creation of hazard-free zones
- ✓ Reduced risk for road maintenance crews
- ✓ Minimized effects of rain

Economic

- ✓ Economic use (compost etc.)
- ✓ Reduce use of weed and pest control products

Flexibility

- ✓ More efficient use of staff, time, and equipment
- ✓ Different management tools and techniques

General goals and benefits

Environmental

- ✓ Increased biodiversity and focus on rarer plant communities
- ✓ Create new habitats
- ✓ Reduced number of invasive plants and weeds
- ✓ Improved water quality by trapping sediment
- ✓ Support a healthier carbon monoxide/dioxide balance

Aesthetic

- ✓ Creation of a more diverse vegetation
- ✓ Flowering roadsides

Roadside decree – June, 27 1984

- Art. 1: all road shoulders along roads, waterways and railways have to be ecologically mowed if managed by government
- Art. 2: the use of herbicides is forbidden
- Art. 3: mowing with removal of grass/clippings to be performed after June, 15 or September, 15
- Art. 4: exceptions can be granted by the minister of environment

European implementation

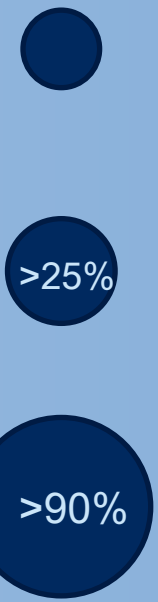
- ✓ **NATURA2000**: EU-wide network of nature protection areas established under the 1992 Habitats Directive

- ✓ **Nature Management Plan** (Flanders), 2015:
  - ✓ 4 types of management plan
  - ✓ Obligation for government at least *type 2*:
    - >25% of surface needs to correspond to a so-called nature type
    - Criteria sustainable nature management

Type 1:
Basic nature quality

Type 2:
Increased nature quality

Type 3-4:
Nature quality = goal

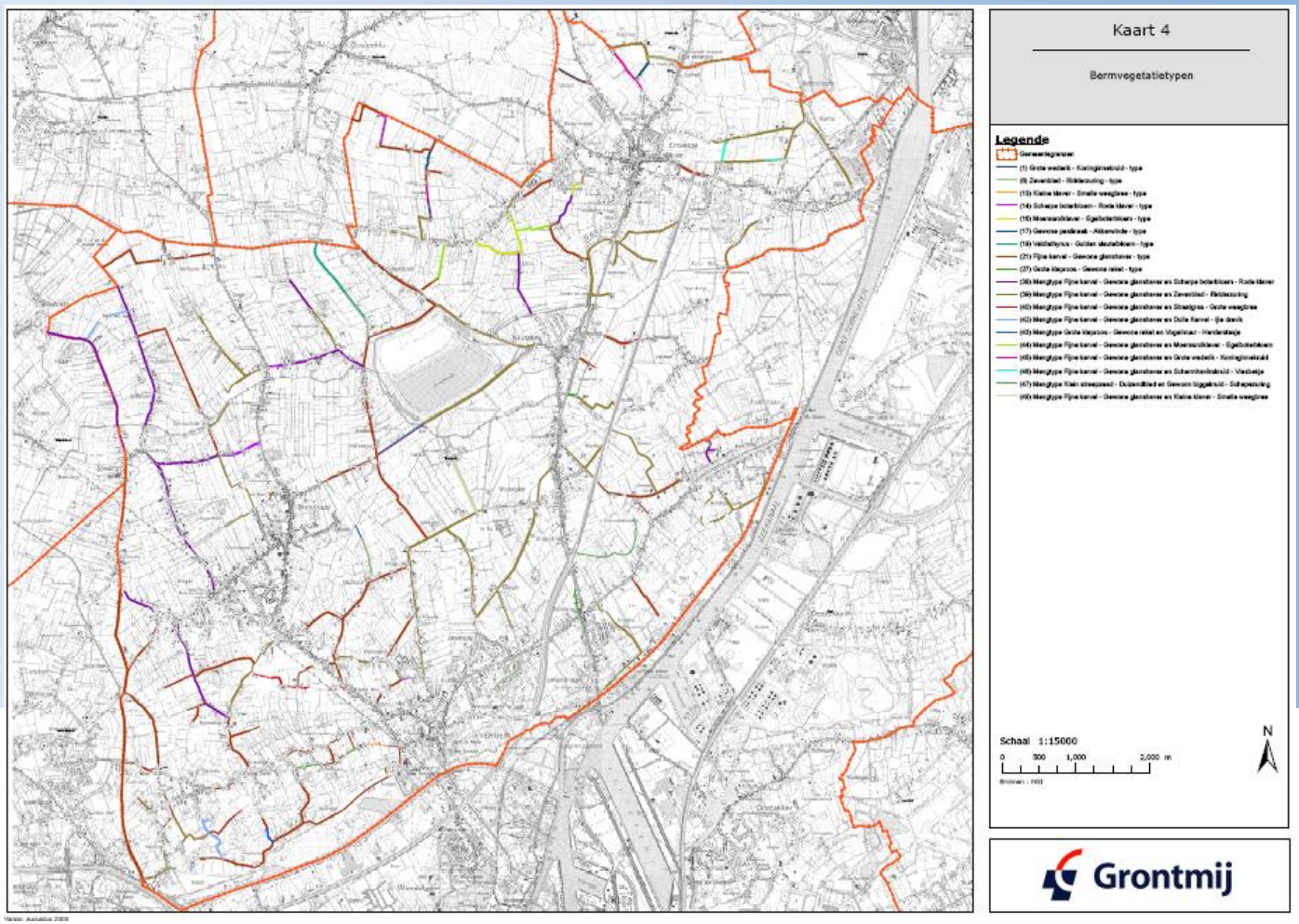


Methods – Inventory

- Inventory vegetation types: may-june (+ september)
  - *or* 37 types according to Zwaenepoel, 1998
  - *or* reduced inventory (nutrient status vegetation)
- Inventory of plant species

Results of the inventory

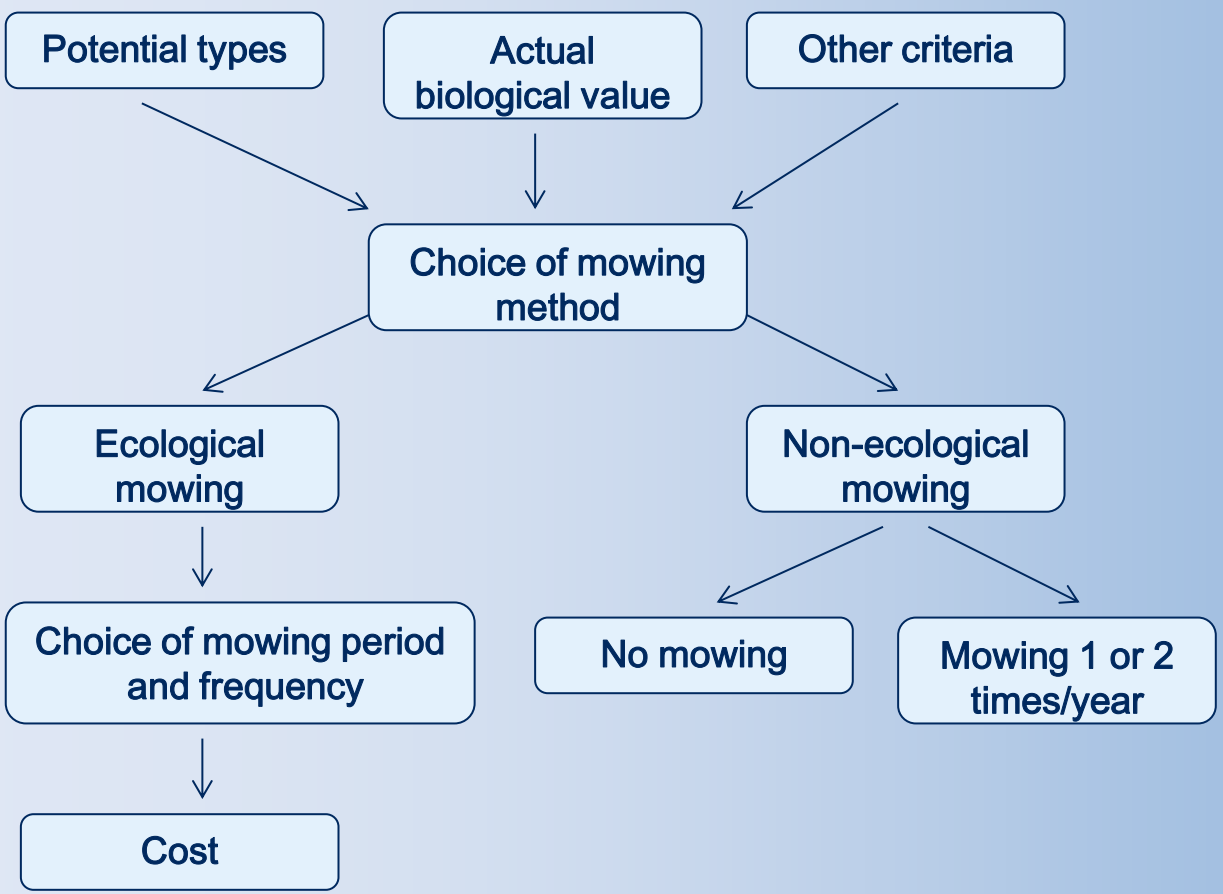
- Species list – Red list species (Van Landuyt, 2006)
- Maps with vegetation types



Management plan - criteria

- ✓ the type of vegetation desired
- ✓ the desired appearance of the roadside
- ✓ soil conditions
- ✓ roadway traffic
- ✓ roadway use and safety
- ✓ adjacent land use

Management plan – general method



Management plan – mowing period

1st mowing period:

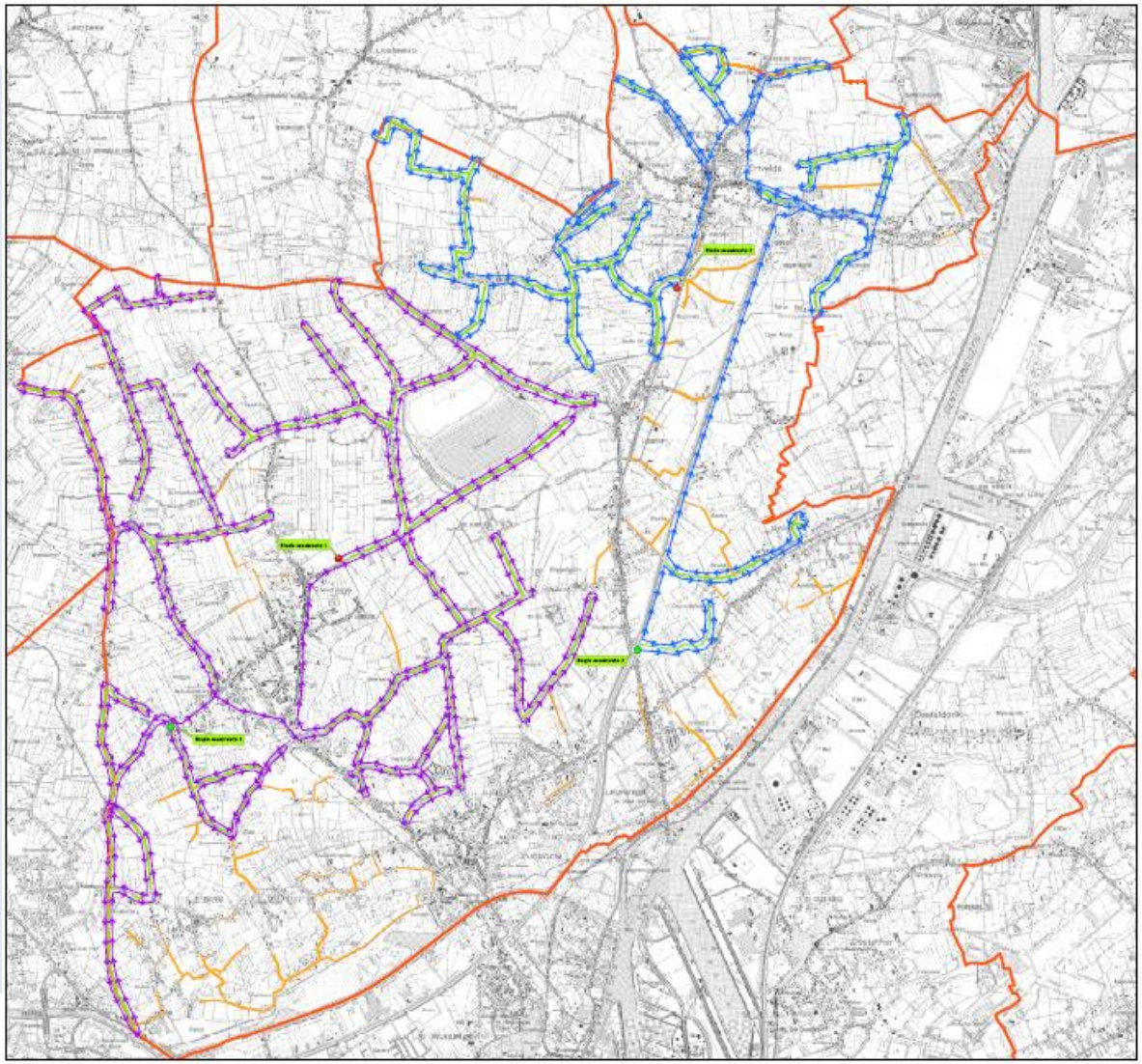
- *Species-poor vegetations, nutrient rich*: mid May
  - quicker lower vegetation (tourism, visibility)
  - climate change: early growing season
- *(Suboptimally) Flowering vegetations, nutrient rich*: beginning to mid June
- *Waterways*: 1st mowing period

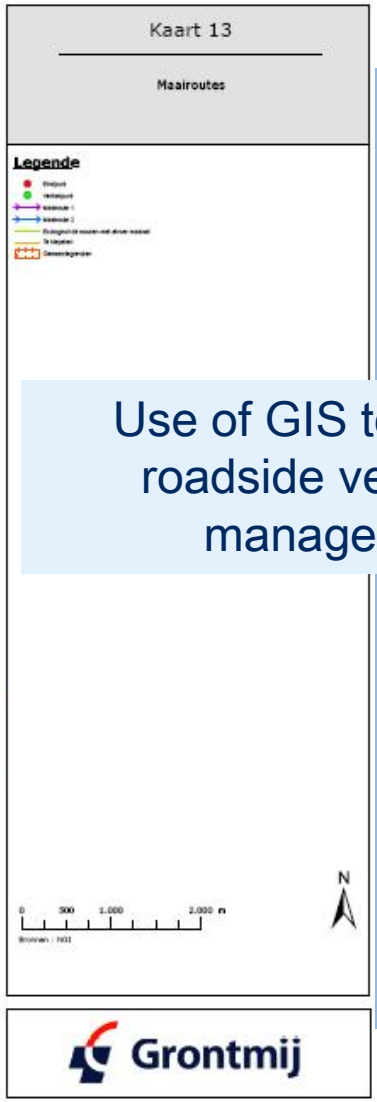
Management plan – mowing period

2nd mowing period:

- ***Species-poor vegetations, nutrient rich :*** September-October
- ***(Suboptimally) Flowering vegetations, nutrient rich***: September-October
- ***(Suboptimally) Flowering vegetations, nutrient poor: only 1 mowing period:*** September-October

Mowing map





Use of GIS to assist in roadside vegetation management.

Grontmij

Cost

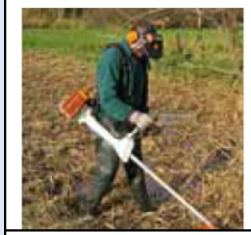
- **Ecological mowing vs. non-ecological mowing:**
  - *1 mowing period:*
    - 0.06-0.11 €/m² vs. 0.02-0.025 €/m²
  - *2 mowing periods*: cost of 2nd mowing lower (lower production):
    - 0.10-0.19 €/m² vs. 0.04-0.05 €/m² (total cost)

- **Manual mowing (e.g., brush cutter round trees, obstacles, …):**
  - 0.015 €/m²

Mowing equipment

Mower type	Advantages	Disadvantages	Uses
Rotary mower 	• Similar to a lawn mower, fine result • High efficiency • Combined with a collector: removes hay in one operation • Size may be adapted, from small machine to tractor based	• Significant perturbation • Clippings are cut and reduced in size and therefore hard to remove fully • Useless for high vegetation • Cannot be used on uneven terrain	• For herb vegetations and limited woody vegetation • For large, fairly even surfaces including inclines • Easy use under and along road infrastructure such as fencing
Disc mower 	• Very well suited for tall grass • Hay does not get shredded • Applicable to less even surfaces and inclines • Less prone for breakdowns than bar cutters	• Less perturbation • Hay has to be put on swaths for later removal • Not suitable for rough terrain: rather prone to breakdowns	• Regular mowing of grassy vegetations • Mowing of tall grassy vegetations • Haymaking
Flail mower 	• High efficiency • Universally applicable (high inclines, rough terrain) • Robust and not prone to breakdowns • Hay and clippings can be removed in one operation when combined with a collector	• Not ecological • Strong perturbation • Clippings hard to remove completely because they get shredded	• Can be used on all sorts of terrain • Combined with a collector often used along long roadsides
Drum mower 	• Hay does not get shredded • Hay is put on swaths immediately • High efficiency • Low maintenance cost	• Average perturbation • Not useful in very high vegetations • Requires a powerful tractor • Clippings must be removed separately	• Hay making • Especially for large areas

Mowing equipment

Mower type	Advantages	Disadvantages	Uses
Cutter bar mower 	• Adaptable to one or two axles • Minor perturbation • Fine result, grass is orderly cur and placed • Usable on inclines • Requires little tractor power due to low weight • Ideal for high vegetations	• Very prone to breakdowns • Not useful for uneven terrain • Slow • Clippings and hay must be removed separately	• Long grass vegetations and heavy herbal growths • Light woody vegetations and heather • Small scale uses • Limited use on roadsides but ecologically advisable
Brush cutter 	• Hay does not get shredded • All-terrain use • Very precise • Mower heads adaptable to vegetation type	• Hay must be separately removed • Slow, so small scale only	• Mowing around street infrastructure (signposts, trees, ...) • Not easy to reach places
Basket mower 	• Hay is cut immediately and gathered in the basket • Ideal for aqueous environments and high (reed) vegetations.	• Slow	• Ditches and riversides

Raking equipment

Rake type	Advantages	Disadvantages	Uses
Rotary turner 	• Organizes hay in swaths or distributes it for drying. Some combine both capabilities	• Requires tractor	• Drying of hay
Bank tedder 	• Tractor pulled or on hydraulic arm • Organizes hay in swaths or distributes it for drying		• Small scale use • When used with a hydraulic arm, can be used on inclines

Some management plans for roadsides

- ✓ Ring (RO) Brussels: ecological mowing
- ✓ E17 (Eastern Flanders, Waasmunster): heather development
- ✓ Ring (RO) Antwerp: differentiated (ecological) mowing
- ✓ N42 (Eastern Flanders, Zottegem): sheep grazing

Grontmij

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- Leaflet Roadside mowing Flemish Government: Leidraad Natuurtechniek – Ecologisch bermbeheer: http://www.lne.be/themas/milieu-en-infrastructuur/Leidraad%20natuurtechniek%20-%20ecologisch%20bermbeheer.pdf