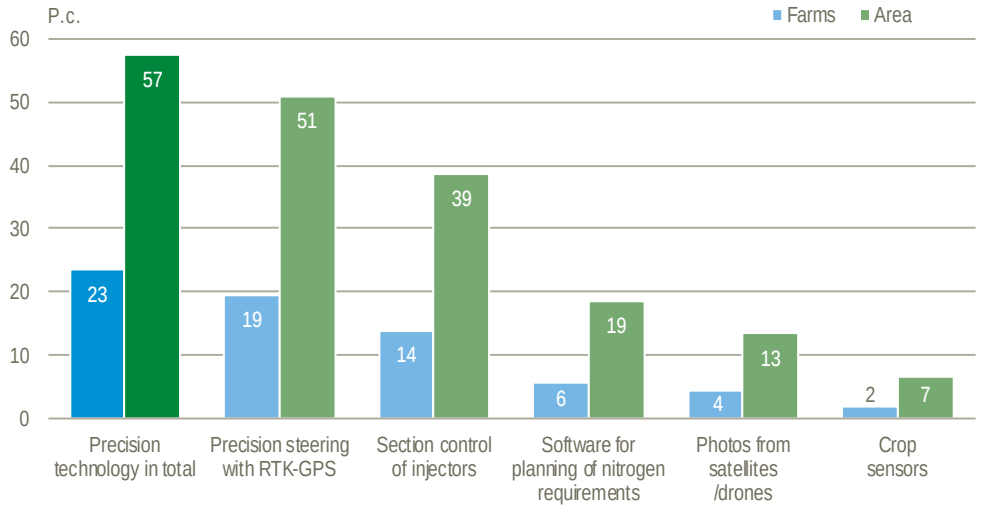
NYT FRA DANMARKS STATISTIK

8 October 2018 No. 380

Advanced technology conquers the Danish fields

Nearly one in four farmers use precision technology in some form. This is particularly the case for the large farms, meaning that precision technology is used on 57 per cent of the total agricultural area. Precision agriculture includes the use of data from satellites, sensors etc. for more accurate navigation and targeted application of fertiliser etc. In this publication, we look into which types of technology farmers apply and which farmers apply them.

Precision agriculture - use by number of farms and area. 2018



Note: Including own use, use by advisors, managers, contractors etc. *RTK-GPS*: GPS with an accuracy of 1-2 cm using land-based signal stations. *Section control of injectors*: individual control of nozzles, e.g. to avoid overlap of pesticides in plots with irregular shapes. *Crop sensors*: sensors on tractors or machines for measuring the state of weed or crops (e.g. Yara N).

Precision steering is still the most widely used

Precision steering with RTK-GPS is the most widely used: 19 per cent of the farmers use it for more accurate navigation of tractors or combine-harvesters. Fourteen per cent use section control of injectors, six per cent use software for planning of varied nitrogen requirements, and four per cent use photos from satellites or drones for monitoring and mapping of the state of the field, e.g. the growth of the crop. Finally, two per cent use crop sensors on tractors and equipment for measuring nitrogen requirements etc.

Precision steering and satellite photos progressing

The share of farms using precision steering increased from 16 per cent in 2017 to 19 per cent in 2018. The use of photographic data from satellites or drones is rarer, but increased from three per cent in 2017 to four per cent in 2018. The other types of use are new in the survey.

Farms using precision technologies are more than twice as big as the rest

Typically, the penetration of the technologies is two to three times higher if you look at the area owned by the users instead of the number of farms. This is because especially the large farms have embraced precision agriculture. Farms using precision technology have an average area of 197 hectares as opposed to 81 hectares for all crop farms.

DANMARKS STATISTIK

Newsletters (in Danish) from Statistics Denmark
are published daily at 8.00 am

Link to this publication:
www.dst.dk/nyt/30775

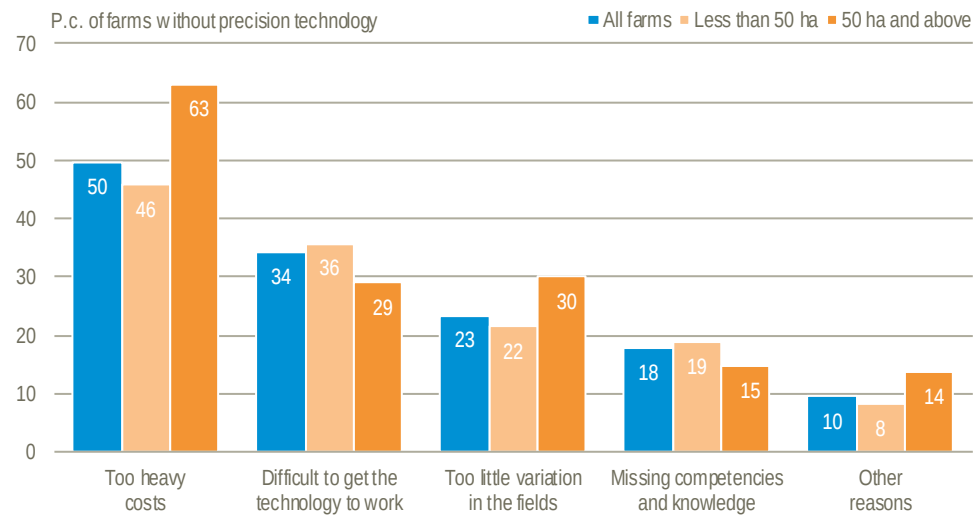
ISSN 1601 1015

Follow us on Twitter

Cost is the most frequent reason not to use precision technology

Half of the farmers not using precision technology mention that costs relative to expected benefits are too heavy. This makes costs the most common reason for rejecting the new technologies. Next, it is problems making the technology work in practice (34 per cent), too little variation in the fields, e.g. soil conditions (23 per cent), and missing competencies and knowledge (15 per cent). Ten per cent mention other reasons, e.g. outdated machinery equipment.

Barriers for use of precision technology. 2018



Note: The sum of barriers exceeds 100 per cent, since it is possible to select several reasons for the non-use.

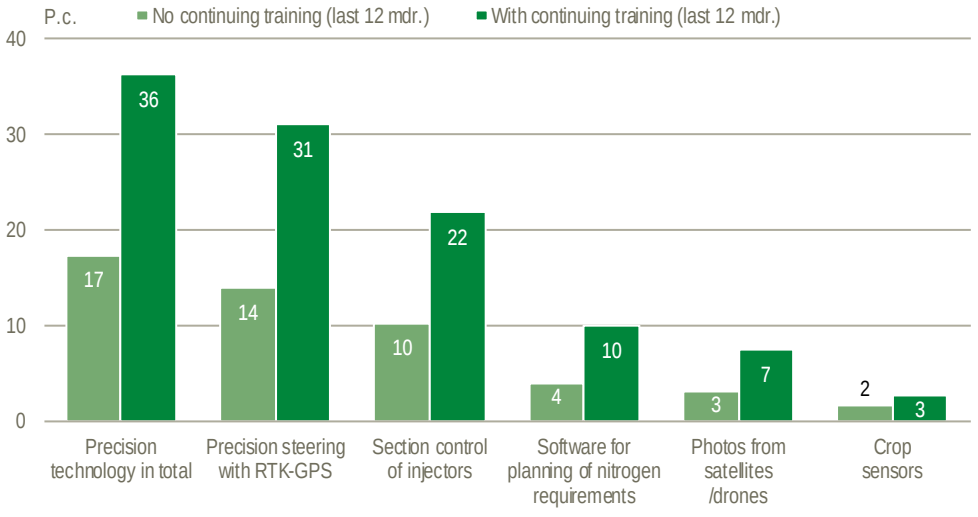
Large farms more frequently see costs of the technology as a barrier

Farms with at least 50 hectares of land more frequently than small farms indicate "too heavy costs" as a reason for not using precision technology. In many cases, farms with less than 50 hectares are part-time farms and might conceivably not take an active approach to the benefits and costs of the technology to the same extent as the large farms. Some farmers have responded, "Don't know" when asked about the barriers, which may be because they have not yet decided or planned to decide.

Farmers with continuing training take the lead

Of farmers who have recently been in continuing training, 36 per cent use precision technology, whereas this is the case for only 17 per cent of farmers without recent continuing training.

Use of precision agriculture and continuing training. 2018



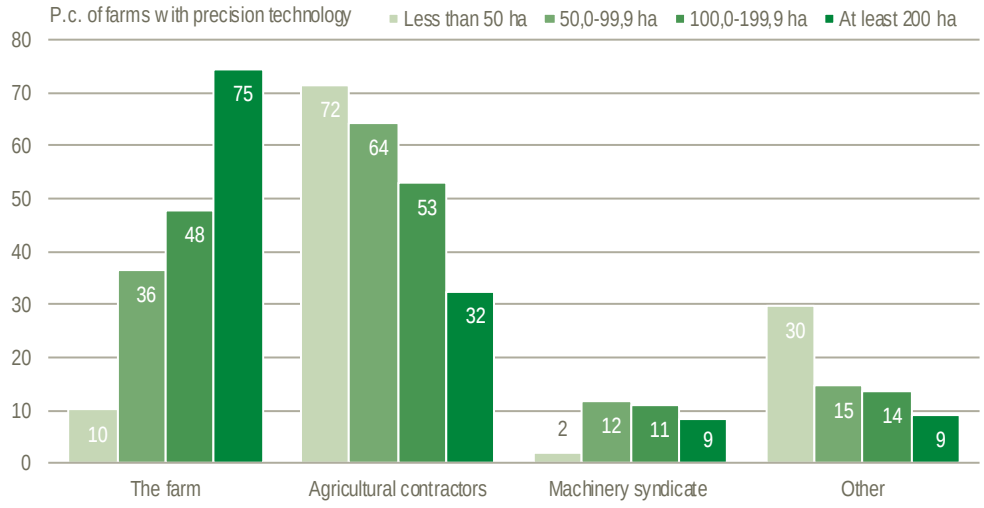
Note: 32 per cent of all farms have been in continuing training within the last 12 months.

Contractors are a shortcut to precision technology for small farms

For 53 per cent of the farms using precision technology, agricultural contractors ("tractor stations") own the equipment. 45 per cent of the farms own their own equipment and eight per cent own it via a machinery syndicate with other farmers. 17 per cent indicate other types of ownership.

Owning your own equipment is most common among the large farmers. This is the case for 75 per cent of farms with at least 200 hectares against only 10 per cent of the farms with less than 50 hectares. For small farms, agricultural contractors are vital for their use of precision agriculture. E.g. contractors own the equipment used on 72 per cent of farms with less than 50 hectares against 32 per cent of the farms with at least 200 hectares.

Equipment ownership of the precision technologies used on the farm. 2018

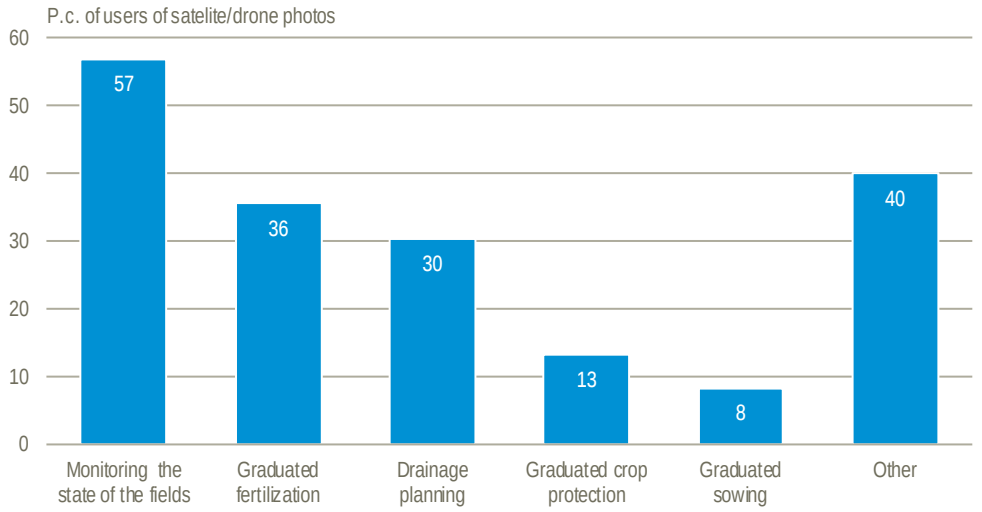


Note: The sum of ownership exceeds 100 per cent, since some farms use equipment with different types of ownership.

Few farms use photographic data from space

Four per cent of all farms use landscape photos and data from satellites or drones to monitor or analyse the state of the fields. Of these, 57 per cent use the photos to monitor the state of the crops, 36 per cent as a basis for graduated (i.e. more detailed management of the application) fertilization, and 30 per cent for drainage planning. Graduated crop protection and graduated sowing are less widespread uses with 13 and 8 per cent respectively. Forty per cent indicate other purposes.

Use of photos from satellites and drones by purpose. 2018



Note: The sums of the bars exceed 100 per cent because some farmers use photos for several purposes. Figures for use of photos from satellites and drones are subject to some uncertainty because of the small number of users. Some users could not state whether they used satellite or drone photos, e.g. because they did not do the job themselves. Use of traditional aerial photos from aircraft is not included.

Use of precision technology. 2018

	Farms	
	no.	per cent
Farms in total with cultivated area	**32 833**	**100**
Use photos from satellites/drones	1 465	4
Type of photos		
From satellites	1 177	4
From drones	251	1
Don't know satellites/drones	186	1
Purpose of use of photos from satellites/drones		
Graduated fertilization	521	2
Graduated crop protection	193	1
Sowing/seed	121	0
Monitoring of the state of the crops	835	3
Compilation of draining schemes	445	1
For other purposes	585	2
Tractor/combine-harvester with RTK-GPS	6 388	19
Software for planning and documentation of varied nitrogen requirements	1 902	6
Section control for application of crop protection or chemical fertilizer	4 589	14
Crop sensors on tractors or machines	642	2
Farms in total with precision technology	7 698	23
Without precision technology	25 136	77

More information: Other figures from the Agriculture and horticulture census are available in Statbank Denmark at www.dst.dk/stattabel/2394.

Sources and methodology: The survey of precision agriculture was compiled as part of the Agriculture and horticulture census and financed in part by the Danish Agricultural Agency.

The results on precision agriculture are based on responses from 5,708 farms in a preliminary survey of the Agriculture and horticulture census (approx. 74 per cent of total responses). Total population: 32,833 farms with a cultivated area (excl. farms without a cultivated area, typically greenhouse nurseries and poultry or fur farms).

The questions in the survey all refer to use in the past 12 months in relation to May 2018. It includes own use and use via advisors, managers, agricultural contractors, etc.

RTK improves ordinary GPS signals to an accuracy of 1-2 cm using land-based signal stations. RTK-GPS is primarily used in tractors and combine-harvesters. Precision navigation saves time and fuel, and is also a condition for applying a number of GPS-related data. Alternatives to RTK with less accuracy (3-20 cm) were not included in the survey.

Read more about sources and methodology in the statistical documentation of the Agriculture and horticulture census.

Next publication: *Precision agriculture 2019* is published in week 39 of 2019.

Contact: Martin Lundø, +45 39 17 38 73, mlu@dst.dk
Karsten Larsen, +45 39 17 33 78, kkl@dst.dk