

# Results of a trial land use survey on Google Earth Pro in Japan using the Dot Sampling Method

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Dot Sampling Research Center conducted a trial land use survey of cultivated land area estimation on Google Earth Pro using the dot sampling method in July 2018.

The test was conducted to see whether the estimated cultivated land area was stable or not when the survey with a sample size of about 1000 was conducted 12 times while changing the starting point, and the results were compared with the official statistics.

The results are shown in Table-1 below. The table shows that the estimates of the dot sampling method on Google Earth Pro are stable and close to the official statistics by MAFF. Although the estimated value of cultivated land in No8 is a little low, it is an event that can occur often from sampling theory. In addition, to avoid such estimates, the sample size needs to be increased.

**Table-1: Results of land use survey on Google Earth Pro**

Trial survey	Share of land use by category (Unit:%)						Sample size
	Non-cultivated land	Cultivated land			Avandand cultivation	Total	
		Cultivated land with dyke	Cultivated land without dyke	Dyke			
No1	86.5	12.5	11.7	0.8	1.0	100.0	983
No2	86.9	12.5	11.3	1.2	0.6	100.0	977
No3	86.6	12.4	11.6	0.8	1.0	100.0	976
No4	85.6	13.0	12.2	0.8	1.3	100.0	975
No5	86.8	12.1	10.8	1.2	1.1	100.0	978
No6	87.2	12.1	11.1	1.0	0.7	100.0	990
No7	86.2	12.7	11.8	0.9	1.1	100.0	990
No8	88.5	10.6	9.7	0.9	0.9	100.0	981
No9	86.5	12.5	11.7	0.8	1.0	100.0	983
No10	87.2	12.0	11.2	0.8	0.8	100.0	973
No11	86.8	12.2	11.5	0.7	1.0	100.0	985
No12	86.0	13.0	11.9	1.1	0.9	100.0	974
<b>Average</b>	<b>86.7</b>	<b>12.3</b>	<b>11.4</b>	<b>0.9</b>	<b>1.0</b>	<b>100.0</b>	<b>980</b>
<b>Official statistics by MAFF of Japan (2016)</b>	<b>86.9</b>	<b>12.0</b>	<b>11.5</b>	<b>0.5</b>	<b>1.1</b>	<b>100.0</b>	<b>Racio estimate</b>
<b>Standard deviation based on the obtained estimates</b>	<b>0.7</b>	<b>0.6</b>	<b>0.6</b>	<b>0.2</b>	<b>0.2</b>	<b>-</b>	<b>-</b>
<b>Theoretical standard error based on the formula</b>	<b>1.1</b>	<b>1.0</b>	<b>1.0</b>	<b>0.2</b>	<b>0.3</b>	<b>-</b>	<b>-</b>
<b>Relative efficiency</b>	<b>2.5</b>	<b>2.9</b>	<b>2.7</b>	<b>1.7</b>	<b>3.3</b>	<b>-</b>	<b>-</b>

Note: Relative efficiency is an index indicating the efficiency of the dot-grid random sampling for simple

random sampling.