

**Dust Concentration Measurements in Airborne**  
(Presented by Kobayashi committee)

- ◎ Dust concentrations during farming are generally as follows (these should be considered as reference data because the measured method was different from that used now).

Plowing with a rotary plow: 0.65-1.59 mg/m<sup>3</sup> (Kochi Agricultural Research Center <sup>1)</sup>)

Plowing with a rotary plow: 0.87-1.21 mg/m<sup>3</sup> (Kochi Agricultural Research Center <sup>2)</sup>)

Plowing with a plow: 57.3 mg/m<sup>3</sup> (USA, with cabin window open <sup>3)</sup>)

90 mg/m<sup>3</sup> (East Germany, with cabin window open <sup>4)</sup>)

Plowing with a disc harrow: 98.6 mg/m<sup>3</sup> (USA, with cabin window open <sup>3)</sup>)

References

- 1) Kazuko Shibuya, Yukishige Yamasaki, Satoru Ibuki, Application method of spent rock wool in paddy fields, Bulletin of the Kochi Agricultural Research Center, Volume 13, pp.81-87 (2004).
- 2) Summary report of results and plans of Shikoku agricultural research in the fiscal year 2000 – Work techniques – Volume 47 (2000).
- 3) Donald L. Sparks (ed.), Advances in Agronomy, Volume 80, p.17 (2003).
- 4) Kyoshiro Miura, Humitake Ishikawa, Actual conditions of dust in farming work, Journal of Japanese Society of Agricultural Machinery, Volume 40 (2), pp.278-282 (1978).

- ◎ Dust data obtained during top soil removal work

Data were obtained by measurements made along the agricultural road neighboring the test field, 2 m away from the boundary of the test field and 1 m above the ground surface, for the works shown below; the test field which was an agricultural field with a movable roof had not been cultivated after weeding and its moisture content was 15% or less.

1. Harrowing (Tractor + Vertical harrow)	Total dust	18.8 mg/m <sup>3</sup>	PM4	0.3 mg/kg
2. Removal of top soil (Tractor + Rear blade)	Total dust	0.4 mg/m <sup>3</sup>	PM4	0.1 mg/kg
3. Collection of top soil (Front-end loader → truck)	Total dust	0.8 mg/m <sup>3</sup>	PM4	0.1 mg/kg
4. Compaction of removed soil (Back-hoe → gabion bag)	Total dust	16.7 mg/m <sup>3</sup>	PM4	0.4 mg/kg

These tests were conducted under the worst possible conditions.

As operators are actually in the cabin of the tractor, the dust concentration around them is in the range of 0.1-0.3 mg/m<sup>3</sup>.