

## The impact of hedgerow to the lead content in plants cultivated adjacent to motorway

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**ABSTRACT:**

Lead pollution is a worldwide environmental challenge. The present study was intended to evaluate the lead content of the pot marigold (*Calendula officinalis* L.) plants collected from a test field adjacent to motorway. The test field was separated from the heavily trafficked (>10,000 vehicles/d) motorway by the blue spruce hedgerow which was located transversely in a distance of 12 m from roadside. The pot marigold inflorescences (commonly used as pharmaceutical herbs) and leaves were collected at distances of 20 to 80 m from the roadside; the lead content was estimated using the dithizone lead determination technique. The 2.5 m high dense spruce hedgerow reduced the lead contamination of pot marigold leaves for 40 m from the hedgerow; the average lead content of leaves was 12.5 µg pro 100 cm<sup>2</sup>. Contrary, at the 60 m distance to the hedgerow, a peak in lead content (33 µg/100 cm<sup>2</sup>) was found. The absolute lead contents for the inflorescences were much lower (2-8 µg/100 cm<sup>2</sup>) and no unidirectional impact of the hedgerow on the lead content of inflorescences was found. In conclusion, the 2.5 m high dense spruce hedgerow was found to reduce the lead contamination of pot marigold leaves for a distance up to 40 m from the hedgerow. The lead content of pot marigold inflorescences was variable and it depends on additional environmental factors. Consequently, to reduce the health risks it is recommended to shield the pot marigold cultivation field from the traffic-originated lead pollution with an appropriate hedgerow.

**Keywords:**

Lead content, lead, pot marigold, *Calendula officinalis* L., environmental factors, dithizone lead determination.