A quadratic optimization model for the consolidation of farmland by means of lend-lease agreements

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In many regions farmers cultivate a number of small lots that are distributed over a wider area. This leads to high overhead costs and economically prohibits use of high tech machinery hence results in a non-favorable cost-structure of production. The classical form of land consolidation is typically too expensive and too rigid, whence consolidation based on lend-lease agreements has been suggested. In order to exploit the potential of this method specific mathematical optimization algorithms are needed, particularly since the underlying problem is NP-complete even in very restricted cases. This paper introduces a quadratic optimization model and shows its practicality for some typical regions in Northern Bavaria, Germany.

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