

### **Evaluation and Licensing Opportunities**

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### **Patent Literature**

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Granted patents:  
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# **Insect pest protection through jasmonic acid seed treatment**

## **Environmentally benign pesticide applied as seed treatment results in long lasting protection against herbivorous pests**

Jasmonic acid (JA) is a naturally occurring, non-toxic compound and is a member of the jasmonate class of plant hormones. It is biosynthesized from linolenic acid by the octadecanoid pathway. It has an important role in plants' response to wounding and systemic resistance mechanism. JA plays a role in insect and disease resistance: many genes during plant defence are induced by JA, and JA and ethylene may act together in defence responses.

Researchers at Lancaster University have developed a seed treatment incorporating JA which is compatible with existing seed treatment technology. Seeds are soaked in low concentrations of JA, typically for 24 hours, followed by drying. Other possible treatment options include the application of powders, dusting or application of slurries. After treatment the seeds can be stored and sown at a later stage. Plants grown from seeds treated in this way demonstrate long lasting effects on defence across the different developmental stages; the seed treatment "primes" induced responses so that they are deployed more effectively upon challenge. In principle the seed treatment induces elements of natural plant defence with resistance against pests being regulated by the oxylipin pathway.

No negative effects on plant growth were observed on plants grown from seeds treated in this way. While the positive effects of pesticide control of JA are known, the current invention has an advantage over existing technologies in that no phytotoxicity is observed; phytotoxicity is a commonly observed problem in JA treatments of plants in foliar application strategies.

The technology has been successfully demonstrated with seeds from **tomato, sweet pepper, wheat and maize**. In these tests, seeds were treated with JA in aqueous solutions for 24 hours. Typically seeds were planted eight weeks after treatment. Plants were challenged with a range of pests, caterpillars (of tobacco hornworm), aphids and spider mite for tomato, aphids for pepper and cucumber and *Spooptera exempta* caterpillars for maize and wheat. These pests were allowed to feed for between 2 and 14 days. In the experiments with caterpillars the leaf area consumed was reduced by between 40 to 60% in the plants grown from treated seeds compared with control plants. In the experiments with the spider mite, feeding was reduced and in addition reductions of pest population and in reproductive rates were observed.

### **References:**

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