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22nd Century Group Completes Successful Non-GMO Very Low Nicotine Content Tobacco Research Field Trials

Research Validates New Non-GMO Methodologies for Reducing Nicotine in Tobacco Plants by up to 99%

WILLIAMSVILLE, N.Y.--(BUSINESS WIRE)-- 22nd Century Group, Inc. (NYSE American: XXII) ("22nd Century" or "the Company"), a leading plant biotechnology company focused on reduced nicotine tobacco and hemp/cannabis plant genetics research and development, announced today that the Company and North Carolina State University ("NCSU"), have completed successful research field trials that have validated new non-GMO (genetically modified organism) methodologies for reducing nicotine in tobacco plants. The research was partially funded by 22nd Century and was conducted by NCSU's Department of Crop and Soil Science with project oversight provided by 22nd Century's R&D team. The research findings and paper can be viewed at the following link: <https://doi.org/10.3389/fpls.2020.00368>

As an alternative to older, genetic-engineering technologies that result in the creation of plants regulated as GMOs, the NCSU researchers used newer, non-CRISPR, non-GMO, gene editing technologies to consistently achieve reductions in nicotine levels by as much as 99%, when compared to conventional tobacco plants. This reduction in nicotine levels is believed to be caused by the inactivation of several genes believed to encode for enzymes involved in nicotine biosynthesis in the plant. 22nd Century has earlier filed a patent application with the U.S. Patent and Trademark Office to secure intellectual property rights for this non-GMO genetic approach that achieves very low nicotine content (VLNC) levels in tobacco plants using non-GMO methodologies.

"We are very pleased with the outcome of the research field trials completed in collaboration with NCSU, which demonstrate that non-GMO methodologies can be applied reliably to reduce nicotine levels in tobacco plants by up to 99%. To further validate our research, 22nd Century and NCSU will conduct larger scale and more extensive field trials in additional geographies," said Juan Sanchez Tamburrino, Vice President of Research and Development for 22nd Century.

The additional field trials will test these new, non-GMO, VLNC tobacco lines in multiple locations and soil conditions, allowing 22nd Century to select VLNC tobacco plants for optimal performance in different locations.

Commenting on this work, Michael Zercher, 22nd Century's President and COO, said, "This research marks a key milestone in 22nd Century's reduced nicotine content tobacco R&D program and further extends our product development opportunities by enabling the creation of VLNC tobacco plants of many varieties, including bright, burley and oriental tobaccos. This non-GMO technology is also key to commercializing our VLNC tobacco cigarettes in international markets where non-GMO products are important. We are pleased with our R&D team's progress and excited about this unique technology developed in collaboration with NCSU."

22nd Century's proprietary, reduced nicotine tobacco cigarettes, containing 95% less nicotine than conventional cigarettes, enable adult smokers to experience the same taste and smell as conventional cigarettes but with minimal exposure to nicotine. Numerous independent scientific [studies](#) funded in large part by the FDA, the National Institutes of Health (NIH) and other U.S. federal government agencies using the Company's reduced nicotine content tobacco cigarettes studies show conclusively that smokers who use 22nd Century's reduced nicotine content tobacco cigarettes (i) reduce their nicotine exposure and dependence, (ii) smoke fewer cigarettes per day, (iii) experience reduced withdrawal symptoms, (iv) increase their number of smoke-free days, and (v) double their quit attempts – all with minimal or no evidence of nicotine withdrawal or compensatory smoking.

The Company believes that bringing its reduced nicotine content tobacco cigarettes to market will be an important step towards the implementation of the FDA's proposed [plan](#) to require all cigarettes sold in the U.S. to be made "minimally or non-addictive." By limiting the nicotine content of all combustible cigarettes to just 0.5 milligrams of nicotine per gram of tobacco, a level already achieved in by 22nd Century's [products](#), FDA [projects](#) that five million adult smokers would quit one year after implementation and over eight million American lives would be

saved by the end of the century.

About 22nd Century Group, Inc.

22nd Century Group, Inc. (NYSE AMERICAN: XXII) is a leading plant biotechnology company focused on technologies that alter the level of nicotine in tobacco plants and the level of cannabinoids in hemp/cannabis plants through genetic engineering, gene-editing and modern plant breeding. The Company's primary mission in tobacco is to reduce the harm caused by smoking by bringing its proprietary reduced nicotine content cigarettes with 95% less nicotine than conventional cigarettes to adult smokers in the U.S. and international markets. The Company's primary mission in hemp/cannabis is to develop proprietary hemp/cannabis plants with unique cannabinoid profiles and desirable agronomic traits and to commercialize those plants through a synergistic portfolio of strategic partnerships in the hemp/cannabis industry.

Learn more at xxiicentury.com, on Twitter [@_xxiicentury](https://twitter.com/xxiicentury) and on [LinkedIn](https://www.linkedin.com/company/xxiicentury).

Cautionary Note Regarding Forward Looking Statements

This press release contains forward-looking statements concerning our business, operations and financial performance and condition as well as our plans, objectives and expectations for our business operations and financial performance and condition that are subject to risks and uncertainties. All statements other than statements of historical fact included in this press release are forward-looking statements. You can identify these statements by words such as "aim," "anticipate," "assume," "believe," "could," "due," "estimate," "expect," "goal," "intend," "may," "objective," "plan," "potential," "positioned," "predict," "should," "target," "will," "would" and other similar expressions that are predictions of or indicate future events and future trends. These forward-looking statements are based on current expectations, estimates, forecasts and projections about our business and the industry in which we operate and our management's beliefs and assumptions. These statements are not guarantees of future performance or development and involve known and unknown risks, uncertainties and other factors that are in some cases beyond our control. All forward-looking statements are subject to risks and uncertainties and others that could cause actual results to differ materially from those contained in our forward-looking statements, please refer to "Risk Factors" in our Annual Report on Form 10-K filed on March 11, 2020. We undertake no obligation to publicly update or revise any forward-looking statement as a result of new information, future events or otherwise, except as otherwise required by law.

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