

Kanpeki Rice

Combining Dry-Seeding Techniques and WaterBit Precision Irrigation Technology to Deliver Premium Rice

Overview

Rice provides 60% of the world's caloric intake on a daily basis. Greg Van Dyke, a fifth generation farmer and owner of Kanpeki Rice, is combining his in-field agricultural knowledge with WaterBit's precision irrigation technology to improve the yield and water use efficiency of this vital crop. Greg plans to implement this knowledge not just locally within his 3,200 acres of rice fields located in Pleasant Grove, California, but he is also actively working to spread rice-growing knowledge across the world. "We can learn more in the next two seasons of applying WaterBit technology than we've learned in the past 3,000 years since rice has been cultivated," says Greg. "I've been a rice farmer my whole life. It's my passion. As a California rice farmer, it is my dream to affect the world and with a simple change of applying technologies like WaterBit, this is a reality."

Greg isn't your ordinary farmer; with a background in academia and linear programming, he is keenly interested in applying scientific methods and using variables to predict outcomes in his rice production to increase yield and quality, conserve resources and reduce his carbon footprint. When he was introduced to WaterBit's precision irrigation solution, Greg saw a way to harness the "amazing knowledge and power WaterBit gives you and how it can be applied in a scalable fashion." Currently, WaterBit is deployed on a trial field of 80 acres that Greg refers to as his "research project." His goal is being able to "scale and grow this and learn more and more data and information," which he can apply to his crops and share with other rice growers worldwide.

Kanpeki specializes in growing Japonica Rice, a premium rice varietal that is also known as "sushi rice." Rice, like fine wine, takes on the flavor and characteristics of the climate and soil that it is grown in – and Kanpeki's Japonica varietal won top honors in several worldwide rice tasting competitions.

Kanpeki employs a dry-farming method to grow its rice, which differs from the traditional flooded field method used across 98% of California's rice crops. This is also the globally used method for irrigating rice. In the traditional method, seeds are spread by a crop duster flying above the field and then the rice remains in a flooded environment throughout the continuity of its life until just before harvest when the water is removed. Dry-farming also uses a crop duster to distribute seeds, but utilizes much different water management practices that impact not only water usage but also yield, taste and quality.

As the name suggests, dry-farming employs periods of "drying down" the field to control invasive weeds species and increase the heartiness of rice, which actually improves its taste and quality. Water is periodically flushed through the fields rather than letting the rice



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President/Owner of Kanpeki Rice
and 5th Generation Farmer



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GREG VAN DYKE

roots remain saturated in standing water – resulting in a 15-25% water savings. “We learned that a lot of the characteristics of the physiology of rice are improved when it’s in a drier environment and isn’t constantly in moisture,” says Greg. “You have less risk of airborne pathogens, fungus and stem rot. The grain is dramatically healthier.” In fact, only one herbicide is used to control 90% of the weeds and it never comes in contact with the rice thereby eliminating any possibility of chemical residue on the rice. Dry-farming has other positive environmental impacts, including the reduction of greenhouse gas emissions like methane that breed in oxygen-free, water-saturated environments.

Kanpeki’s WaterBit deployment includes a combination of WaterBit Carbon™ nodes and soil moisture probes that perform in-field monitoring and data collection. The Carbon nodes are waterproof, compact, solar-powered, battery-free, long-range (LoRa) radio-powered devices that are placed directly in the rice fields and collect in-field data from soil moisture probes. The probes are inserted 48 inches into the soil and pull six sensor-depth readings. Carbon nodes stay out of the way of harvest operations and require no towers inside the field’s perimeter, so aerial operations like crop duster seeding and other aerial applications can happen as regularly scheduled. Carbon nodes communicate with WaterBit Connect™, our cellular gateway, which relays the information to the cloud and into the WaterBit Dashboard™ where Greg can view the soil moisture and temperature data on his computer or mobile device from anywhere, at any time.

(Kanpeki does not yet employ WaterBit’s Block Valve Controller™ that automatically opens and closes valves. Rice growers spend upwards of 50% of their time in-season irrigating, shutting and opening gates. In the future, WaterBit plans to work with Greg on tuning solutions to automate this time consuming task.)

WaterBit provides Greg with real-time ground-level precision data about the soil moisture and temperature levels of his rice fields. Accordingly, he says he can “pinpoint when I bring my floods in, or my flushes across for saturation, so that I’m not wasting energy before I need to.” Greg also uses the WaterBit data to help him protect the rice against invasive weed species. Rice can out-survive a weed that is deprived of water, which is extremely important to growing in a sustainable environment with the use of minimal herbicides. “(In the past,) I used experience and historical knowledge to really guess through trial and error what those accurate points were. WaterBit allows me to now have the metrics to know exactly how and when my soil is going to be at what moisture and temperature,” says Greg. “WaterBit provides me with tremendous knowledge.”

Greg may be a native to California, but he is thinking globally and wants to “apply the WaterBit technology and bring it to some of the most impoverished parts of the agriculture and rice-producing parts of the world.” Currently, he is working with rice growers in Chiang Rai region of Northern Thailand where he has created a small research farm. Greg’s goal is to first “learn the true power and implication of the WaterBit technology and then transition and start applying it” across the globe.

“WaterBit is applying technology in a smart, rational, logical manner to try and solve and quantify issues and make the agricultural industry more efficient. With exponential global population growth, it is critical to apply all of the science, technology and communication we can, to understanding the best, most sustainable, efficient practices” so that food production can serve the needs of the world and those who rely on rice for sustenance. Greg is looking to use “the amazing knowledge and power that WaterBit offers and see how it can be applied on a scalable fashion” to help feed this forever growing world.

About WaterBit

WaterBit’s precision irrigation solution enables control of local irrigation taking into account plant stage, soil conditions and weather at a level of granularity and accuracy that is not possible with current methods. WaterBit translates technology into tangible value for growers to improve yields, optimize water usage and implement labor saving strategies. [Learn more at www.waterbit.com](http://www.waterbit.com).



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