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MGI Tech launches whole workflow solution for Agricultural Genome SequencingÂ

14 June 2024 | News

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MGI Tech Co., Ltd. (MGI), a company committed to building core tools and technologies that drive innovation in life science, announced a highly efficient whole workflow solution for agricultural large-scale Low-pass whole genome sequencing (Low-pass WGS) based on its proprietary DNBSEQâ?¢Â platforms.

The new solution consists of an automated full-process product portfolio designed for large-scale molecular breeding genotyping of agricultural diploid species. The full workflow covers extraction, library preparation, sequencing, and SNP & InDel calling.

The new MGIEasy Large-scale PCR-Free FS Library Prep Set for Low-pass WGS, available in two specifications, 96RXN and 384RXN, is designed specifically for Low-pass WGS applications with a new plate-based library preparation reagent module. Compared with common PCR-free library preparation sets on the market, this kit cuts the purification step and completes library construction in three easy steps, reducing the time and consumables required.

In combination with MGI's advanced automation platforms, the Low-pass WGS solution breaks through the limit on throughput as seen in ordinary library preparation. It utilizes the fewer number of automated tools to match ultra-high throughput, as while maintaining a high degree of automation. As a result, large-scale library preparation can be done in a short time, at low cost, and with great automation friendliness.

For sequencing, the product bundles for high throughput and medium throughput Low-pass WGS feature the ultra-high-throughput DNBSEQ-T7 sequencer and the versatile DNBSEQ-G400 benchtop sequencer respectively, empowering large-scale agricultural genomics research projects in a short time.

"Since genome selection was widely used in agricultural breeding, genotyping tools went through several iterations, sequencing technology gradually shows its irreplaceable advantages," said Duncan Yu, President of MGI. "Low-pass WGS has been applied in both animal and plant breeding, but not without implementation challenges. Our new total solution for large-scale pig breeding addresses these user pain points and promises flexible automation needs, simplified library preparation, high throughput sequencing, and efficient data processing."

Bolstered by MGI's powerhouse instruments, this agricultural Low-pass WGS solution has a daily throughput of 96 to 1,536 samples and annual throughput of 24,000 to 384,000 samples (based on the 1.0X depth of a pig genome and an average sample data output of 3G). It has also obtained high-accuracy SNP results from 0.5~1X Low-pass in pig ear tissue samples, demonstrating 98.4% consistency with the SNP array and 98.1% with 50X WGS. Together with MGI's self-developed MegaBOLT bioinformatics analysis accelerator, it can analyse 192 pig 1.0X samples daily, and approximately 1,536 per day with ZBOLT Pro.

Compared to traditional genotyping by microarray, MGI's new solution offers genome-wide data at the same cost but captures a broader range of genetic variation, enhances the discovery of new variants, and increases the statistical power of genome-wide studies, all while eliminating high design and start-up costs associated with microarrays. The dynamic features of this solution enable continuous updates and optimizations in genomic analyses.