

Spring Meadow Nursery: Behind the Scenes – What it Takes to Become a Proven Winner ColorChoice® Shrub

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Summary

Spring Meadow Nursery was established in 1981 in Grand Haven, Michigan, and has emerged as a leader in the horticultural industry. Through collaboration with a global network of breeders as well as an internal breeding and trialing program, Spring Meadow has developed a wide array of woody ornamental plants that meet high standards for consumer success, disease resistance, and environmental friendliness.

The nursery's commitment to innovation, quality, and sustainability has led to over 249 plant awards and a significant impact on the industry, underlining its role as a key player in advancing horticultural practices and ornamental plant varieties. A motto from the owner runs deep and if you know him and anything about the nursery you will know, "It's a good start".

INTRODUCTION

Spring Meadow Nursery was founded by Dale and Liz Deppe in 1981 in Grand Haven, Michigan, on the same site it exists today – what was formerly their backyard. Spring Meadow Nursery hired its first full-time employee in 1986, published its first catalog in 1988, and hired Tim Wood (as a Plant Hunter) in 1995 with the role of finding and trialing the newest and best in woody ornamentals from all over the world. The brand ColorChoice® was introduced in 1999, conveying the message that shrubs can be more than just a green blob or foundation plant; rather, they have a real place in the landscape. A partnership was formed between Proven Winners® and Spring Meadow in 2004, as both realized that they shared the common goal of introducing not only new plants but better plants to the industry. Noteworthy advancements include

the addition of a tissue culture lab in 2011, overcoming an office fire incident in 2017 (which led to an office expansion), and becoming the first company to reach \$1,000,000 in donations to the Horticultural Reach Institute in 2021.

Spring Meadow first and foremost is a wholesale liner production nursery, offering three different sizes: 2 1/4", 4", and Quick Turn or 1-quart size liners (**Fig. 1**). Over the years, the nursery has seen substantial growth in its facilities, transitioning from what once was a mix of Quonset, Cravo, and Gutter Connect greenhouses to a more robust and extensive West Brook style (**Fig. 2**), which now encompasses almost 60 acres. The shift was partly due to the enhanced structural integrity offered by the West Brook designs.



Figure 1. (left) 2 1/4" liners, (middle) 4" liners, and (right) quick turn or 1-quart liners.



Figure 2. (left) Aerial photograph of Spring Meadow Nursery's facilities in 2007, and (right) aerial photograph of Spring Meadow Nursery's facilities in 2022.

TECHNOLOGIES

Spring Meadow Nursery emphasizes innovation and efficiency in its operations, marked by significant technological advancements. The adoption of a TTA Grading Machine (**Fig. 3**) in 2007 was the nursery's first major investment in automation, enhancing product quality. Subsequently, the integration of proprietary trimming machines in 2009, tailored for the new West Brook-style growing spaces, demonstrated a commitment to operational efficiency. This was further expanded with the introduction of spraying machines, streamlining the nursery's processes.

In 2016, the nursery introduced an ISO Robotic Sticking Machine (**Fig. 4**), leading to the addition of more machines over the years, facilitating uniform planting processes. In 2017, Spring Meadow began trialing broad scale biological pest control methods (**Fig. 4**), notably improving pest management and reducing the need for chemical controls. This successful trial led to a nursery-wide application of biological controls, including the use of beneficial organisms, starting in 2018, furthering the nursery's move towards more sustainable and efficient production methods.



Figure 3. (top left, top right) sorting machine at Spring Meadow Nursery and (bottom left, bottom right) trimming machines at Spring Meadow Nursery.

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Figure 4. (top left, top right) sticking machines at Spring Meadow Nursery and (bottom left, bottom right) integrated pest management at Spring Meadow Nursery.

WHERE DO THE NEW PLANTS COME FROM?

Spring Meadow Nursery's mission focuses on identifying, breeding, and evaluating superior plant varieties. To achieve this, Spring Meadow maintains a global network of over fifty active plant breeders, ranging from hobbyists to nursery growers and academic partners, including top university plant breeding programs. Plant Hunters

Tim Wood and Dr. Judson LeCompte, who joined the team in 2020, manage these collaborations.

One of Spring Meadow Nursery's foremost partners is Dr. Tom Ranney (**Fig. 5**) with the Mountain Horticultural Crops Research & Extension Center at North Carolina State University. Ranney and his team developed the Invincible Spirit Line of smooth hydrangeas (**Fig. 5**). This initiative,

launched in 2009, supports breast cancer research by donating a portion of the proceeds from each plant sold. Spring Meadow

Nursery achieved a significant milestone of one million dollars in donations contributed to the Breast Cancer Research Foundation in 2018.



Figure 5. (left) Dr. Tom Ranney from North Carolina State University and (right) Invincibelle Spirit Hydrangea.

In addition to collaborating with an extensive network of external breeders, Spring Meadow Nursery has been breeding plants in house for 23 years. Initiated by Tim Wood, the success of this program has allowed for the expansion of the team, including hiring Megan Mathey in 2013 as well as Davis Harmon in 2022 as additional plant breeders, thus greatly expanding specialized breeding efforts.

BREEDING AND NEW PRODUCT DEVELOPMENT

At Spring Meadow Nursery, the starting point for any plant breeding project is having an idea and setting specific goals, such as making the plant more dwarf, increasing flower size, improving remontancy capabilities, or enhancing disease tolerance. Once an idea and goal are at hand, traditional plant breeding techniques are often instrumental to achieve them. This early phase of

plant development involves selecting ideal parents, emasculating the female plant to prevent self-pollination (**Fig. 6**), and then introducing pollen from the chosen male plant to achieve the cross.

Spring Meadow Nursery has a small on-site tissue culture lab for tasks like mutation breeding, particularly through ploidy manipulation (**Fig. 7**). Actively growing meristems are exposed to a meiotic inhibitor, resulting in a doubling of chromosomes. Ploidy doubling is one avenue breeders often utilize as the first step in developing sterile plants and is a strong example of breeding for reduced fertility. Techniques such as flow cytometry (**Fig. 7**) are utilized for in-house confirmation of elevated ploidy. This technique is used to identify tetraploids, which can then be used as a parent to back cross with diploids in the same genera, resulting in triploid progeny.



Figure 6. Emasculating the female plant to prevent self-pollination.

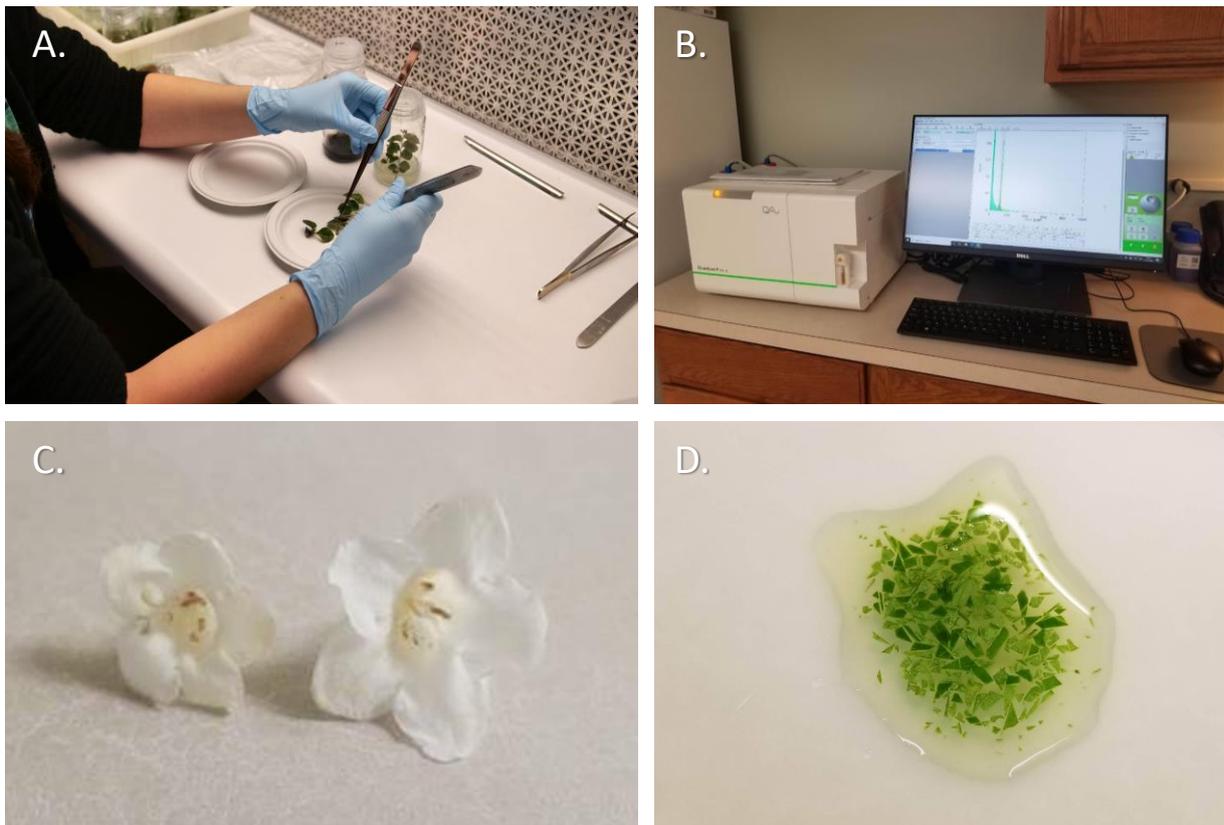


Figure 7. (A) Tissue culture lab for mutation breeding, ploidy manipulation, embryo rescue, and export, and (B-D) flow cytometry.

The breeding process continues with seed collection, cleaning, sowing, and, if necessary, stratification (**Fig. 8**). Tens of thousands of seedlings are produced annually from an average of 600 unique seed lots. About 10,000 - 15,000 seedlings are planted in the field, and another 10,000 are grown in the greenhouse. Sorting and rouging of seedlings begin early and can even

start before the plants are transplanted out of their germination tray. Great efforts are placed on rouging seedlings even at the 4” stage, focusing on traits such as foliage color, habit, and sometimes even flower color. Rouging and selection continues, on average, for the next three to five years as we continue to turn greenhouse and re-research space over.



Figure 8. (A) seed collection, (B-C) seed processing and sowing, and (D-E) seed stratification.

An oftentimes overlooked means of generating new plants is finding sports/natural mutations. A few examples of recent instructions of plants found as sports include *Weigela florida* VINHO VERDE® ‘SMNWFBGV’ (Fig. 9B), arising as a sport on a seedling from a cross between two distinct varieties ‘Briants Rubidor’ (a yellow-leaved weigela) and ‘Naomi Campbell’ (a purple-leaved weigela). Weigela BUBBLY WINE® ‘FLORA CLAR’ (Fig. 9D) is another Weigela sport discovered externally

by plantsman Jeff Good of southeast Michigan from parent plant Weigela FINE WINE® ‘Bramwell’. Similarly, Hibiscus RED PILLAR® ‘GFNHSRP’ (Fig. 9F) was found as a branch sport of ‘Gandini van Aart’ by Dan Baston of Green Forest Nursery out of Mississippi. This plant actually beat out another selection for the “Red Pillar” seat due to its superior flower color and dark red “eye”, proving that, no matter the plant’s origin, “the best plant always wins.”



Figure 9. (A) Weigela Vinho Verde sport, (B) weigela Vinho Verde, (C) weigela Bubbly Wine sport, (D) weigela Bubbly Wine, (E) hibiscus Red Pillar sport, and (F) hibiscus Red Pillar.

SELECTION AND TRIALING

Spring Meadow Nursery’s research and development facility was initially established in 2014, breaking ground for a 2-acre West Brook Greenhouse which has since expanded to encompass approximately 10 acres (**Fig. 10**). This facility centralizes all trials under one roof, ensuring that environmental conditions are consistent across trial groups.

The site is managed by the New Product Development team (**Fig. 11**), including the New Product and Stock Manager, Ginger Thurston, the Plant Breeding Manager, Megan Mathey, and Dr. Judson LeCompte, who oversees External Trials. The team is composed of individuals specializing in different areas, such as stock management (Alex Pott), R&D growing (Tori Boos and Leticia Pasqualino), plant breeding (Davis Harmon and Caleb Pritts),

and tissue culture and intellectual property (Julie Crone).

Criteria for evaluating shrubs at the facility focus on multiple factors to enhance the likelihood of commercial success. These include consumer interest, foliage attractiveness, seasons of color, new uses, compact growth, long blooming or re-blooming properties, disease resistance, lower maintenance, retail appeal, and eco-friendliness.

Trialing involves weekly evaluation meetings starting in March, covering around 194 genera. A preliminary review conducted by a small team precedes the final presentation to Dale Deppe, President, Jeremy Deppe, General Manager, and Tim Wood, Product Development & Head of Marketing.



Figure 10. Aerial photograph of Spring Meadow Nursery's 10-acre Research and Development facility.



Figure 11. Spring Meadow Nursery's New Product Development team.

Trials are conducted in both container settings (**Fig. 12**), with each selection undergoing trials in 38 containers to assess

uniformity and response to various treatments, and field settings (**Fig. 12**), where five plants are tested and in a landscape trial where three of each plant is grown.



Figure 12. (top) Spring Meadow Nursery’s container trials, and (bottom) Spring Meadow Nursery’s field trials.

Data collection extends beyond the onsite trials to include external evaluations (Fig. 13) in diverse climates such as Florida, Minnesota, and Texas, as well as feedback from growers, retailers, and consumers, ensuring a well-rounded and effective trial process for new plant developments. The entire process from breeding to product development typically spans six to eight years, though some plants may take longer.



Figure 13. Spring Meadow Nursery’s external field trials.

CONCLUSION

Spring Meadow Nursery's comprehensive approach to plant breeding and new product development, combined with its thorough trialing process, has contributed to the nursery's success in the horticultural industry. With over 325 plant patents assigned or under license and 249 plant awards and counting, Spring Meadow Nursery demonstrates a high level of innovation and quality in its plant selections.

Because of its rigorous evaluation process, resulting in less than 2% of the varieties in trials being designated as Proven Winners®, the stringent criteria ensure that only the most outstanding, consumer-friendly, and garden-worthy plants reach the market. This selective approach underlines Spring Meadow Nursery's commitment to excellence and sustainability, ensuring that each new plant introduced has a significant impact on gardens and landscapes.