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Farming And Marketing Research Of Stevia: A Review

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ABSTRACT

Stevia (*Stevia rebaudiana*) is a natural sweetener that thrives in subtropical climates with long days and warm temperatures, making it a sustainable crop with high commercial potential. It grows best in well-drained, slightly acidic to neutral soils and requires consistent moisture with proper drainage. Stevia can be propagated via seeds, stem cuttings, or tissue culture, with clonal propagation offering more consistent results. While Stevia does not demand heavy fertilization, balanced nutrient management enhances leaf yield and quality, with special attention to phosphorus and potassium levels. Water management is crucial, and drip irrigation is recommended to avoid waterlogging. Weed control, particularly in the initial stages, is vital for successful cultivation. Pest management may involve treating caterpillar infestations and fungal diseases, with appropriate chemical treatments. Stevia's harvesting typically occurs 90–110 days post-transplantation, with the leaves separated and dried to preserve their sweetness. The plant's primary sweetening compounds—stevioside and rebaudioside A—are extracted for use in food, beverages, and health products. Stevia is known for its medicinal properties, including regulation of blood sugar, support for diabetes management, and potential weight control benefits, making it a valuable alternative to sugar. Its use has grown significantly, especially in the food and beverage industry, where it serves as a low-calorie sweetener. The profitability of stevia farming is promising, with a high benefit-cost ratio and increasing demand for natural sweeteners. Challenges include its bitter aftertaste, which is being addressed through breeding and processing innovations. Stevia's market opportunities are expanding with collaborations across industries, and its sustainability is further enhanced by the utilization of by-products like stems and seeds for animal feed or fertilizer. Stevia is gaining global recognition for its health benefits, affordability, and versatility in food and industrial applications.

INTRODUCTION

Stevia, scientifically known as “*Stevia Rebaudiana Bertoni*”, it is a naturally sweet plant native to the Rio Monday valley in Paraguay’s northeastern highlands. (Goyal et al., 2010). Often called sweet leaf, honey leaf, or candy leaf, this remarkable herb is gaining global popularity as a healthy alternative to sugar, especially for those watching their sugar and carbohydrate intake (Lemus-Mondaca et al., 2012). With zero calories, Stevia is becoming a favorite among health-conscious consumers, offering a natural way to sweeten food and drinks without the drawbacks of artificial sweeteners (FDA, 2008).

Currently, stevia is grown on about 32,000 hectares worldwide, with China leading production at 75% (International Stevia Council, 2023). However, it’s also cultivated commercially in Brazil, Paraguay, Central America, Thailand, Korea, and Japan—where it’s already widely used (Ashwell, 2015). For countries like Kenya, stevia presents a promising opportunity for farmers to join a fast-growing global supply chain (World Bank, 2022).

What makes stevia truly special is its incredible sweetness—200 to 300 times sweeter than sugar—thanks to its natural compounds called steviolides (Prakash et al., 2008). Research suggests these compounds may even help regulate blood sugar by stimulating insulin production, making stevia a potential ally for people with diabetes. In Bangladesh, where millions struggle with diabetes, stevia could offer a much-needed, calorie-free sweetener (IDF, 2021).

Beyond its sweetness, stevia is packed with nutrients like vitamin C, iron, potassium, and fiber. Consuming it fresh or dried may also help with various health issues, including high blood pressure, digestive problems, and anxiety. However, preserving its medicinal properties requires careful drying methods to avoid heat damage.

Stevia is also a resilient crop, helping farmers adapt to climate change and pest challenges (Madan et al., 2010). As demand grows, understanding the best cultivation practices and environmental conditions will be key to maximizing its benefits. This review explores stevia’s potential, farming techniques, and diverse uses, highlighting why it’s more than just a sweetener—it’s a plant with tremendous health and economic promise.

HISTORY OF STEVIA

The story of stevia begins in 1887 when Dr. Moisés Santiago Bertoni, a South American scientist and director of the College of Agriculture in Asunción, Paraguay, first documented its unique sweetening properties (Soejarto et al., 1982). But it wasn’t until 1900 that chemist Ovidio Rebaudi took the next big step in isolating the plant’s natural sweet compounds, called glycosides, which give Stevia its incredible sweetness.

By 1931, researchers had fully mapped out the different glycosides in Stevia, unlocking the secrets behind its intense, sugar-free sweetness.

Commercial cultivation of Stevia began in 1961, but it took decades for the rest of the world to fully embrace it. The United States finally recognized stevia as a natural sweetener in 2008 (FDA GRN No. 252). while Canada approved to use it in foods and beverages, paving the way for its global popularity. Today, stevia stands as a testament to both traditional wisdom and modern science—a plant once known only in Paraguay that has now sweetened lives across the world.

CULTIVATION METHOD

Climate-

Stevia feels most at home in subtropical climates that mirror its native Paraguay and Brazil (**Brandle et al., 1998**), - think warm temperatures and plenty of daylight. This sweet plant really comes alive when it gets about 16 hours of sunlight daily. When temperatures dip below 20°C or daylight shrinks to less than 12 hours, you'll notice it growing more slowly. But give it those long summer days and it'll reward you with both more leaves and sweeter-tasting ones (thanks to higher stevioside content). Some varieties aren't as fussy about day length though (**Singh et al., 2019**).

An interesting trade-off: varieties that flower earlier tend to produce sweeter leaves, just fewer of them. For the best results, Stevia likes a semi-humid environment with some shade protection during the hottest summer months (**Gupta & Mehta, 2017**).

Soil-

When it comes to soil, stevia isn't too demanding but has some clear preferences. It does best in loose, well-draining soil that's rich in organic matter - sandy loam or loamy soils with a slightly acidic to neutral pH (6-7) are ideal. Keep the soil consistently moist (but never waterlogged) for happy plants.

Since stevia's roots stay near the surface, mixing in some compost gives them an easy nutrient boost. For fertilizer, go easy on nitrogen but don't skimp on phosphorus and potassium - splitting the applications works best. Watch out for boron deficiency (showing up as leaf spots), which a simple borax spray can fix. At their peak, healthy stevia plants typically contain about 1.4% nitrogen, 0.3% phosphorus, and 2.4% potassium (**Singh & Reddy, 2020**). Get these growing conditions right, and you'll be harvesting abundant, high-quality sweet leaves in no time.

Propagation and planting

Stevia offers multiple propagation methods including seeds, suckers, stem cuttings, and tissue culture. While seed propagation is the most economical approach, it results in variable plant characteristics. For consistent quality, clonal propagation through cuttings or tissue culture is preferred, though more costly (**Sakamoto et al., 1994**).

When propagating from seeds (best done January-March, or year-round in protected conditions), select fertile dark-colored seeds and sow them in nursery beds or containers with a well-draining soil-sand-manure mix. Maintain careful irrigation - twice daily for the first five days, then once daily for the next five. Germination typically occurs within 7-10 days, with seedlings ready for transplanting after two months when they reach 10-15 cm height with 5-7 leaves.

For stem cuttings, select 10-15 cm sections with 4-6 nodes from healthy plants during mild weather. After removing lower leaves, plant the cuttings with one buried node, maintaining high humidity and partial shade. Daily misting encourages rooting within 10-15 days, after which cuttings can be transferred to potting mix (soil: sand: FYM in 1:1:1 ratio) with twice-weekly watering.

Transplant 50-60-day old seedlings or rooted cuttings to fields during March-April or June-July, avoiding temperature extremes. Optimal spacing varies with soil fertility: 45×45 cm for high fertility (30,000

plants/acre) or 45×30 cm for medium fertility. Pinching the apical bud after establishment promotes bushier growth with more lateral branches, enhancing leaf production (Ceunen & Geuns, 2013).

Manures and fertilizers

Stevia isn't a heavy feeder, but smart nutrient management is key to boosting both leaf yield and quality. For best results, a balanced fertilizer application of 100–120 kg nitrogen (N), 40–50 kg phosphorus (P), and 50–60 kg potassium (K) per hectare is recommended (Yadav et al., 2011). If you're growing stevia organically, 20–30 tonnes of well-rotted farmyard manure (FYM) per hectare works well to nourish the soil

However, the exact fertilizer or manure requirement can vary depending on your soil fertility and cropping system so it's always good to test your soil first and adjust accordingly. By fine-tuning nutrient inputs, you can maximize stevia's sweet leaf production while keeping the plants healthy and thriving.

Water management

After transplanting, give your stevia its first good drink of water right away. For the next few weeks while the plants are settling in, keep the soil moist by watering every 3-5 days. Once they're established, a weekly watering (enough to moisten the top 5 cm of soil) will do the trick - until the monsoon rains take over the job for you (Serfaty et al., 2013).

During scorching summer months, your Stevia will need more frequent drinks to stay happy. If you want to save water while keeping plants perfectly hydrated, drip irrigation is your best friend. But here's the catch - Stevia hates wet feet! While it loves consistent moisture, standing water can spell disaster. That's why preparing your field with proper drainage is just as important as the watering itself. Think of it like giving your plants a cozy bed that's moist but never soggy - that's the sweet spot for healthy stevia growth

Remember: consistent moisture + good drainage = thriving, sweet-leaved stevia plants!

Weed management

Weeds are Stevia's worst enemy, especially in those first crucial months when the plants were still being established young Stevia grows painfully slow, (Brandle & Rosa, 1992) while weeds seem to shoot up overnight, stealing precious nutrients, water, and sunlight. That's why you'll need to stay on top of the wedding - ideally every 3 weeks for the first two months - to give your Stevia plants a fighting chance.

Mulching can be a game-changer! Laying down plant residues or plastic sheets around your stevia does double duty - it smothers weed growth while creating better conditions for your crop to thrive. Think of mulch as a protective blanket that keeps the weeds out and gives your Stevia the cozy environment it needs to grow strong. A little extra effort with weed control early on means sweeter rewards come harvest time!

Remember: In the race between Stevia and Weeds, your timely intervention makes all the difference!

Plant protection

Stevia plants, while resilient, can face challenges from pests and diseases that affect their growth and productivity. Caterpillars occasionally feed on young leaves and buds, but their damage can be minimized by applying insecticides such as cypermethrin, deltamethrin, or quinalphos (1.5–2.0 ml per liter) at 15-day intervals (**Das et al., 2013**). Fungal diseases, particularly leaf blight (*Alternaria* sp.) and leaf spot (*Septoria steviae*), are more prevalent during the rainy season and can significantly reduce both leaf yield and quality. To combat these, alternating sprays of Bavistin and Dithane M-45 (2.0 g per liter) are effective in controlling their spread. Additionally, root rot (*Sclerotium rolfsii*), though less common, may occur in waterlogged conditions and can be managed by soil drenching with Bavistin (2.0 g per liter). To ensure harvested leaves are safe for consumption, it is essential to wait at least 20 days after any chemical treatment before harvesting. Proper monitoring and timely interventions help maintain healthy stevia plants and optimize yield (**Brandle et al., 1998**).

Harvesting

The timing of stevia harvests varies depending on the growing season and local climate. Farmers typically begin with the first harvest 90–110 days after transplanting, carefully cutting the plants about 10–15 cm above the ground to encourage regrowth (**Midmore & Rank, 2002**). A second harvest usually follows 50–65 days later, ideally completed before flowering begins to maintain leaf quality. In cases where transplanting occurs later in the season, only one harvest may be possible after 3–4 months of growth.

One of stevia's greatest advantages is its perennial nature – with proper care, the same plants can continue producing high-quality leaves for 4–5 years. This makes Stevia not just a profitable crop, but a sustainable long-term investment for farmers. The manual harvesting process, while labor-intensive, helps preserve plant health and ensures consistent regrowth across multiple seasons. By timing harvests correctly and maintaining plants properly, growers can maximize both yield and the productive lifespan of their stevia crops.

Post-harvest practices

After harvesting, Stevia undergoes careful processing to preserve its valuable sweetness. The freshly cut plants are dried, and the leaves—which contain the precious steviol-glycosides—are separated from the stems, which contribute only 1–2% of these sweet compounds. Proper drying is crucial: leaves must be dried quickly in the shade or using a controlled hot air oven at 40°C to prevent quality loss. Once fully dried, the leaves can be stored or further processed to extract their natural sweetening compounds. This careful post-harvest handling ensures maximum quality, market value, and efficiency in producing Stevia's signature zero-calorie sweetness.

By optimizing drying and storage, farmers and processors can maintain the leaves' potency while minimizing waste, making every harvest as valuable as possible.

Chemical Components

Stevia is a natural sweetener derived from its leaves, which are rich in glycosides. These compounds not only provide sweetness but also contain high levels of phenols, flavonoids, and antioxidants. The two main glycosides responsible for stevia's sweetness are Stevioside (St), which makes up about 5–10% of dry leaf weight, and Rebaudioside A (R-A), which accounts for 2–4%. Other related compounds, such as Rebaudioside C (1–2%), Dulcoside A & C, and minor glycosides like flavonoid glycosides, coumarins, cinnamic acids, and essential oils, also contribute to stevia's unique properties (Chatsudthipong & Muanprasat, 2009). In total, stevia leaves contain around 10 sweetening glycosides, with stevioside (3–10%) and rebaudioside A (up to 13%) being the most significant. Additionally, the leaves contain beneficial phytochemicals, including dulcosides, steviobioside, and various rebaudiosides. As a non-caloric, natural sweetener, stevia is a safe option for diabetics and is gaining popularity as a healthier option for artificial sugar.

Uses of Stevia

Stevia leaves are naturally sweet and have refreshing taste that can remain in mouth for hours. Its sweetness comes from compounds within the leaves, while the veins contain some bitter component (Prakash et al., 2008). These leaves are commonly used in sauces, but they are best enjoyed in herbal teas or even consumed directly (Goyal et al., 2010). Stevia is available in different forms, such as powdered or ground leaves, bulk packaging, and tea bags. It serves as a natural sweetener and flavor enhancer in a variety of foods and beverages, including teas, salads, fruits, and coffee. The food and beverage industry are the primary market for stevia, followed by the health industry, where it is valued for its potential benefits (Mintel, 2023). Additionally, by-products from the plant, such as stems, seeds, and leaves that are not selected for processing, are often repurposed as animal feed or fertilizer, creating an opportunity for further market development.

Beyond its role as a natural sweetener, stevia is also a source of chlorophyll for oral hygiene products and medicines, as well as phytosterols (Chatsudthipong & Muanprasat, 2009). The fresh leaves have mild licorice-like flavor and are considered as purest form of stevia in an unprocessed way. The plant which has been used for centuries for not only as a sweetener but also for medicinal purposes, such as helping to lower blood sugar levels. The main sweetening compound, stevioside, is a white crystalline substance that contains no calories and is 100–300 times sweeter than table sugar (Purkayastha et al., 2016).

With the increasing demand for low-carb and low-sugar food alternatives, stevia has gained popularity worldwide, particularly in Japan, which is now the largest consumer of steviosides extracted from its leaves. Medical research suggests that Stevia may offer health benefits, including potential support in managing obesity and high blood pressure. Since it has little to no impact on blood glucose levels, it is an appealing sweetener for those on carbohydrate-controlled diets. Traditionally, stevia has been used for centuries in Paraguay and Brazil to sweeten local teas, medicines, and as a natural treat. Today, the leaves are still handpicked, separated from the stems, and processed in specialized factories to extract Rebaudioside A, one of the sweetest compounds, which is hundreds of times sweeter than sugar (Prakash et al., 2014).

Medicinal Uses of Stevia

According to the World Health Organization (WHO), (WHO, 2006), Stevia offers several health benefits, including regulating blood pressure, promoting insulin production, fighting cavities, and acting as a natural antibacterial agent. No negative clinical reports have been found in countries where stevia is widely used. As medicinal plants gain popularity for treating various health conditions, stevia stands out as a beneficial option for diabetics and those managing obesity (Shivanna et al., 2013). Research suggests that it may even help prevent type 2 diabetes. Additionally, stevia has antibacterial, antiseptic, anti-inflammatory, hypotensive, diuretic, and cardiogenic properties (Chatsudthipong & Muanprasat, 2009). It has been found effective in improving skin conditions such as dermatitis, eczema, acne, and scarring. Steviol, one of its key compounds, helps regulate blood sugar by enhancing both insulin secretion and utilization, making it a promising natural alternative for people with diabetes who crave sweets.

Stevia leaves contain about 10% of the steviolides, intensely sweet compounds that provide a natural sugar substitute without impacting blood glucose levels (Goyal et al., 2010). Beyond its use as a sweetener, stevia has been studied for potential applications in cholesterol suppression, oral contraceptive synthesis, and anti-tumor activity, particularly against prostate tumors and rheumatism. Its medicinal benefits also extend to blood sugar regulation, hypertension prevention, and dental health by reducing tooth decay. In fact, statistics show that in some countries, up to 30% sugar consumption has been replaced by stevia-based sweeteners (Mintel, 2022).

Steviol glycosides like the steviolide and rebaudioside are estimated to be 300 times sweeter than sugar, yet they do not allow blood sugar levels to rise, which makes them helpful for those with hypoglycemia and type 2 diabetes. Stevia also supports pancreas health and helps restore its normal function. Rich in phenols and flavonoids, the plant has strong antioxidant properties that may contribute to heart health and cancer prevention. Studies suggest that Stevia can help normalize blood pressure, regulate heartbeats, and act as a vasodilator, benefiting both individuals with normal and high blood pressure. It has even shown diuretic and natriuretic effects in studies on rats (Melis, 1995).

Beyond its metabolic benefits, Stevia is also known for promoting dental health. Since dietary sucrose contributes to cavities, sugar substitutes like stevia can help reduce their occurrence. Steviolide has been shown to combat dental caries by acting as an antibacterial agent, reducing acidity in the mouth, and preventing plaque buildup. As a result, stevia is increasingly used in oral care products such as mouthwashes and toothpastes. It also possesses antifungal properties and can be safely incorporated into herbal medicines and tonics for diabetics. A mild tea made from stevia leaves can even help soothe an upset stomach (Abou-Arab et al., 2010).

Despite its widespread use across different regions, no evidence of adverse effects from consuming stevia or steviolide extracts has been reported in biomedical research. Regulatory agencies, including the Food and Agriculture Organization (FAO), the WHO, and the U.S. Food & Drug Administration (FDA), have all confirmed that high-purity stevia extract is safe for general consumption when used within recommended levels. As a natural, calorie-free sweetener with a wide range of health benefits, stevia continues to gain popularity as a healthier alternative to artificial sugar.

Stevia in the Treatment of Diabetes

Diabetes is a growing global health issue, with 464 million people affected as of 2019, and projections suggesting 642 million by 2040. Type 2 diabetes, accounting for 90% of cases, is linked to genetic factors, poor diet, and lack of exercise. It involves impaired glucose metabolism and insulin resistance, leading to high blood glucose levels (DeFronzo et al., 2015). Stevia, traditionally used in Brazil and Paraguay to treat diabetes, has gained attention for its potential anti-diabetic properties. Research shows that Stevia leaf extracts can increase insulin production and improve insulin sensitivity. In animal studies, Stevia extracts significantly reduced blood glucose levels and improved pancreatic function (Chen et al., 2005). Stevioside and rebaudioside A, key components of Stevia, interact with certain receptors on pancreatic cells, enhancing insulin secretion and glucose transport. Stevia also reduces glycosylated hemoglobin, an indicator of long-term blood sugar control. Studies have found that Stevia extract can decrease both random and fasting blood glucose levels. It may also have anti-hyperglycemic effects by inhibiting enzymes like α -amylase and α -glucosidase, slowing carbohydrate metabolism. Additionally, Stevia has antioxidant properties that improve glucose tolerance in diabetic animals. While some human studies showed no effects on glucose or insulin levels, Stevia is considered safe and could reduce the risk of hypoglycemia. Overall, Stevia shows promise as a natural alternative to managing diabetes, though further research is needed, especially in human trials.

Stevia effects on obesity

Obesity has become a pressing global health crisis, far beyond just a number on the scale. It's a complex condition that opens the door to serious metabolic disorders like diabetes, heart disease, and even cancer, dramatically impacting quality of life. Particularly concerning abdominal obesity, a key player in metabolic syndrome that strains our cardiovascular system and liver health (Després & Lemieux, 2006).

Here's where Stevia offers a glimmer of hope. This zero-calorie natural sweetener isn't just helping people cut sugar—it's showing real potential in weight management. Animal studies tell an interesting story: rats given stevia extracts gained significantly less weight (up to 48% less!) over 12 weeks, while also showing improved cholesterol profiles. The magic seems to work in two ways—stevia appears to naturally curb food intake without leaving subjects feeling hungry, while also enhancing fat metabolism. Mice studies revealed Stevia's ability to boost carnitine levels, essentially helping the body better process fatty acids (Park & Cha, 2010).

Human experience aligns surprisingly well—people consuming stevia don't experience the typical urge to "make up" for lost calories like they do with artificial sweeteners. While more research is needed, Stevia emerges as more than just a sugar substitute, it's a promising ally in our battle against obesity and its dangerous metabolic consequences, offering a sweet solution without the bitter aftertaste of weight gain (Ashwell, 2015).

Marketing Opportunities

The market for stevia leaves has been growing steadily, driven by the increasing demand for natural sweeteners, especially among the rising diabetic population. Although Stevia does not yet have the same well-established marketing infrastructure as other agricultural products, private companies like Stevia World Agrotech in Bengaluru and SSP Group of Companies in Udaipur are helping farmers through contract farming initiatives. Additionally, online platforms such as Flipkart, Amazon, and Big Basket have made it easier for farmers to reach a diverse customer base and sell their stevia products directly to consumers. This

not only simplifies the marketing process but also provides farmers with more opportunities to sell their produce efficiently. Collaborations with food and beverage companies, health-focused retailers, and wellness brands further expand the market reach of stevia products. With these growing marketing opportunities, Stevia farmers can better navigate the industry and take advantage of the increasing demand for this natural sweetener (**International Stevia Council, 2023**).

Costs and returns from Stevia cultivation

The cost and profitability of Stevia farming have been carefully analyzed, considering both variable and fixed expenses over the years. Stevia has an average economic lifespan of four years, and in the first year, farmers typically invest around ₹3,74,419, with major costs coming from planting materials and setting up a drip irrigation system (**Indian Institute of Spices Research [IISR], 2023**). Over the crop's lifespan, the average yield ranges between 2.5 to 3 tonnes per hectare, though slight variations occur each year. Generally, farmers can expect yields of about 2.5 tonnes per hectare in the first year, increasing to 3.0 tonnes in the second and third years, and reaching around 3.5 tonnes in the fourth year. The current market price for stevia leaves is approximately ₹90 per kilogram. With a benefit-cost (B:C) ratio of 1.86, Stevia farming presents a highly profitable opportunity, offering farmers a reliable source of income. The combination of a short payback period and a high B:C ratio highlights the financial feasibility of stevia cultivation, making it a sustainable and promising investment for farmers (**Small Farmers' Agribusiness Consortium [SFAC], 2023**).

Industrial Use of Stevia

In 1995, the U.S. FDA approved the import of stevia and its usage as extracts in food supplement, but not as a sweetener. However, major food companies like Coca-Cola and Beatrice Foods have largely used stevia extracts to sweeten their products in Japan, Brazil, and other countries. In some regions, 30% sugar consumption has been replaced with stevioside-based sweeteners (**Prakash et al., 2008**). Stevioside is accessible in different purity levels such as crude extract, 50%, and 90% purity which has been widely used in Japan since the 1970s in various food and beverage applications, including soft drinks, chocolates, candies, chewing gum, yogurt, and ice cream (**Kinghorn & Soejarto, 2002**). It is often combined with other sweeteners like sucrose, fructose, aspartame, and acesulfame-K, though not with saccharin. Countries like Japan, Taiwan, and those in the Mercosur region have approved stevia for use, with an acceptable daily intake of 7.94 mg per kilogram of body weight.

One of the challenges in Stevia's commercial use is its slightly bitter aftertaste, particularly in foods and beverages. Studies have shown that passion fruit juice sweetened with stevia had a noticeable bitterness and metallic taste, affecting its overall acceptance. To improve its taste, manufacturers use techniques like glycosylation, which modifies the compound's structure, or selective breeding to develop stevia plants with a higher concentration of rebaudioside A, which is sweeter and less bitter than stevioside. For example, a novel variety called *Stevia rebaudiana morita* has been developed to enhance the rebaudioside A to stevioside ratio, making the extract more palatable (**Brandle & Telmer, 2007**).

Stevia has also been used in wheat bread to retain antioxidant properties, and studies show that fruit juices sweetened with stevia contain higher levels of phenolic compounds and antioxidants compared to those without it. Major beverage companies have embraced stevia as a sweetener—Coca-Cola and Pepsi have introduced stevia-based soft drinks like Coca-Cola Lite, Pepsi True, and Stubborn Soda, which offer lower-

calorie alternatives to traditional sodas. Additionally, the use of stevia in ready-to-drink iced teas has surged, with over 300 new stevia-sweetened tea products introduced since 2010 (Euromonitor, 2023).

Stevia is highly stable at high temperatures, making it suitable for baked goods and cooked foods, though it is sensitive to pH changes, with significant degradation occurring in highly acidic environments like carbonated beverages. Beyond its use as a sweetener, Stevia is also valued in the health market and for its by-products. The parts of the plant are not used for industrial processing—such as stems, seeds, and flowers—are repurposed as fertilizers and animal feed, making stevia a sustainable and versatile crop.

CONCLUSION

In conclusion, Stevia is a versatile and sustainable crop that offers significant benefits both as a natural sweetener and a medicinal plant. Thriving in subtropical climates with well-draining, organic-rich soils, Stevia's cultivation requires careful management of water, weeds, and nutrients to maximize its sweet leaf yield. It presents profitable opportunities for farmers due to its high benefit-cost ratio and long-term economic viability. Stevia's applications extend beyond the food industry, where it serves as a calorie-free alternative to sugar, to the health sector, where it supports conditions such as diabetes, obesity, and high blood pressure. Despite challenges like its bitter aftertaste, technological advancements have improved its taste, boosting its commercial potential. With increasing global demand for natural sweeteners and growing interest in its health benefits, Stevia stands as a promising, eco-friendly option for both farmers and consumers.

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