

AGTECH COMMERCIALIZATION & INNOVATION

FROM RESEARCH TO SCALE

How discoveries move from universities and startups through validation, customer discovery, demonstration, manufacturing and commercial growth.

TURNER DEVELOPMENT
Western North Carolina

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The central challenge in AgTech is often not invention. It is translation: converting promising science and engineering into products that work reliably, solve a customer's problem and can be produced, financed and delivered at commercial scale.

The Missing Middle Between Research and Scale

Universities are exceptionally good at generating discoveries. Startups are good at moving quickly around a focused idea. But neither environment, by itself, supplies every capability required to turn a research result into a durable operating company.

Commercialization is a sequence of risk reduction. Technical risk must be reduced through proof-of-concept and prototyping. Market risk must be reduced through customer discovery and field validation. Production risk must be reduced through repeatable processes, suppliers, quality systems and manufacturing. Financial risk falls only when the company can show that customers will pay and that the product can be delivered economically.

DISCOVERY	PROOF OF CONCEPT	CUSTOMER DISCOVERY	PILOT & VALIDATION	DEMONSTRATION	MANUFACTURING	SCALE
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NSF describes technology translation as the movement of fundamental research toward practical use through activities such as proof-of-concept, prototyping, technology development and scale-up. Its I-Corps program is built specifically to reduce the risk of moving inventions from the laboratory to the marketplace through customer discovery and entrepreneurial training.

This is the commercialization gap: the period when a technology is too applied for the research laboratory, but not yet mature enough for a conventional industrial facility or fully scaled business.

Key implication: Successful innovation ecosystems need more than laboratories and venture capital. They need places, people and programs that support the intermediate stages - testing, pilots, demonstration, engineering, small-batch production and early manufacturing.

Sources: U.S. National Science Foundation, NSF I-Corps; NSF I-Corps Biennial Report 2025.

How University Research Becomes a Business

There is no single route from university research to market. The most common paths include licensing an invention to an established company, forming a startup around university intellectual property, conducting additional use-inspired research, or combining these approaches through industry partnerships.

Stage	What changes	What is needed
1. Research	A scientific or engineering discovery shows promise.	Research funding, faculty, students, laboratory infrastructure.
2. Translation	The team asks whether the discovery can become a useful product.	Proof-of-concept, prototypes, technology transfer, IP strategy.
3. Customer discovery	The problem and buyer are tested outside the laboratory.	Industry mentors, customer interviews, market feedback.
4. Venture formation	A startup or licensing pathway is selected.	Entrepreneurial leadership, seed funding, SBIR/STTR or private capital.
5. Pilot & validation	The technology is tested in realistic operating conditions.	Greenhouses, farms, pilot facilities, technical partners, early customers.
6. Commercialization	The product becomes repeatable and saleable.	Engineering, supply chain, certifications, production systems, sales.
7. Scale	The company expands production, distribution and markets.	Growth capital, manufacturing, warehouse, talent and commercial space.

The NSF I-Corps model illustrates how deliberate this transition can be. National teams conduct extensive customer discovery rather than assuming that a technically successful invention automatically has a market. Teams may then form startups, pursue SBIR/STTR and other funding, conduct further use-driven research, or work with university technology-transfer offices to license the technology.

In other words, commercialization is not simply 'raising money.' It is a process of converting scientific knowledge into evidence: evidence that the technology works, that somebody needs it, that somebody will pay for it, and that it can be delivered repeatedly.

What the Data Say About Translation

The National Science Foundation's 2025 I-Corps Biennial Report provides a useful large-scale example of what structured commercialization support can accomplish across deep technology.

3,200+	1,696	\$7.01B	75%
technologies explored since FY2012	I-Corps-linked startups through FY2024	subsequent funding raised	share of subsequent funding from private sources

For FY2012-2024, NSF reports that 52% of participating National I-Corps teams were linked to startups. Those startups had raised approximately \$7.0 billion in subsequent funding, including about \$5.26 billion in private investment and \$1.75 billion in public funding. The figures cover deep technology broadly, not AgTech alone, but they demonstrate the leverage that structured translation programs can create.

The ecosystem matters

NSF's National Innovation Network uses university-based I-Corps Hubs to connect researchers, entrepreneurs, mentors and regional innovation communities. In FY2023-2024, ten hubs represented 128 institutions of higher education. This network approach recognizes that commercialization is rarely accomplished by the inventor alone.

For AgTech, the network is even more physical. A crop-science company may need controlled greenhouse zones. A robotics company needs fabrication, field access and repair space. A sensor company needs crops, weather and real operating conditions. A biological product may require repeated trials across plants, soils and environments.

Source: U.S. National Science Foundation, 2025 NSF Innovation Corps Biennial Report, covering FY2023-2024 and cumulative program data through FY2024.

Why AgTech Needs Commercialization Places

AgTech sits at the intersection of science, hardware, biology, software and the physical world. That makes commercialization unusually dependent on specialized environments.

Greenhouse & growing environments Controlled conditions for crop science, biologicals, genetics, sensors and repeatable trials.
Farms & field access Real-world validation across weather, soils, crops and operating practices.
Prototype & engineering space Room to build, modify and troubleshoot equipment outside a university laboratory.
Flex industrial space Assembly, electronics, light manufacturing, loading, storage and service operations.
Demonstration environments Places where customers, investors and partners can see technology operating.
Commercial networks Connections to growers, universities, suppliers, manufacturers, capital and early customers.

A commercialization campus can therefore function as shared infrastructure. Instead of every startup raising capital to create a specialized facility, companies can lease what they need, validate faster and preserve capital for technology development, people and market entry.

The most valuable campuses do not try to replace universities. They extend the innovation pipeline beyond them.

For a region, this creates a different economic-development opportunity. Research institutions generate intellectual property and talent; commercialization facilities help retain some of that activity as companies mature into employers, manufacturers and long-term tenants.

From Innovation Ecosystem to Scale Economy

The strongest commercialization model connects distinct assets rather than trying to put every function under one roof.

UNIVERSITIES	STARTUPS	COMMERCIALIZATION CAMPUS	FARMS & CUSTOMERS	CAPITAL & INDUSTRY
Discovery + IP	Entrepreneurship + speed	Test + demonstrate + build	Validation + adoption	Finance + partnerships

For Western North Carolina, this suggests a complementary role within the broader Southeast innovation economy. Research can originate in universities and established research clusters. Companies can then move into facilities designed for real-world validation and commercialization - greenhouse research, prototyping, demonstration, assembly, light manufacturing, warehousing and distribution.

This is the strategic logic behind pairing different kinds of AgTech real estate. A research greenhouse campus serves biological and plant-science companies that need controlled growing environments. A flex-industrial commercialization park serves robotics, sensing, irrigation, precision agriculture, hardware and companies moving into assembly and distribution.

*The goal is not simply to house startups. It is to help create **scale businesses** - companies that have crossed from research into recurring customers, repeatable production, larger workforces and durable commercial operations.*

A practical commercialization thesis

Research creates possibilities. Customer discovery identifies value. Validation creates evidence. Demonstration creates confidence. Manufacturing creates repeatability. Distribution creates reach. Scale creates an enduring business.

Commercialization infrastructure is the bridge connecting those stages.

Selected Sources

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AgTech commercialization in Western North Carolina