Vavilov's Achievement

by Carmelo Ruiz-Marrero

Every modern society needs a substantial public investment in agricultural research. And such research requires the acquisition of useful plant and seed specimens from all over the world. It is no different in the case of socialist societies. During the first half of the twentieth century the Soviet Union was a world leader in the fields of genetics, plant science and the study of agricultural biodiversity, in large part thanks to the colossal work of one single individual: geographer Nikolai I. Vavilov.

Between 1916 and 1940, Vavilov carried out intrepid voyages through five continents collecting seeds of agricultural plants, such as corn, potato, grains, forages, fruits and vegetables, as well as valuable data about the geography of the places he visited and about the languages and cultures of their inhabitants.

Vavilov participated in some 100 expeditions to over 50 countries and collected over 200,000 specimens. No other individual in history has come even close to equaling such a feat. Thanks to his collecting expeditions, the USSR's seed collection was the biggest in the world during his time. These seeds were stored and planted in agricultural research stations distributed throughout the extremely diverse terrains and climates of the Soviet Union. His ideas of agriculture, biodiversity and geography remain to this day so influential that the places of origin of the world's most commonly planted agricultural crops are named Vavilov centers.

Vavilov participated in 100 expeditions and collected over 200,000 specimens.

Born in Moscow in 1887 and brother of the world-renowned physicist Sergey I. Vavilov, the young Nikolai worked at the Russian Bureau of Applied Botany from 1911 to 1912. At the time, the Bureau enjoyed great international prestige and esteem in the field of crop diversity studies.

> The Bureau's basic task was to study cultivated crops and useful, weedy or detrimental wild plants of the Russian Empire. Special research projects were conducted on the following agricultural crops: all cereals (wheat, barley, oat, rye, millet, Panicum Sorgfium, rice, etc.); industrial crops including fiber and oil-bearing plants; horticultural crops (cabbage, cucurbits and melons, legumes, root crops, tuber crops, medicinal and aromatic plants, and fruit-bearing plants); as well as wild plants, such as all weeds and pasture plants (grasses, sedges and legumes)... By 1914 the Bureau's collections had been greatly enlarged by accumulating the germplasm requested and shipped from various farms in Russia and by the collecting missions of the Bureau's researchers. [1]

The Bureau's collection had by then some 14,000 seed samples. About half of these were wheat and barley. The rest were mostly oat, rye, pasture grasses, and over 1,000 types of weeds. Plus the Bureau had a herbarium with more than 10,000 specimens collected in different provinces of Russia. [2]

Between 1913 and 1914 Vavilov studied in England with professor William Bateson, one of the main forefathers of modern biology and inventor of the term "genetics."

Back in 1900, when he was developing his concepts of heredity, Bateson ran into an obscure paper written in 1860 by an Austrian monk of the Order of St. Augustine. The monk, Gregor Mendel, had experimented with 29,000 pea plants and made extremely detailed observations of how their traits were inherited from one generation to the next. Bateson became Mendel's advocate, he publicized his work and defended it in the face of competing theories of heredity. Mendelian genetics, which back then was not fully accepted by the scientific community, would exert a great influence on Vavilov's ideas.

Vavilov went on to teach in Saratov University in southern Russia. And in the autumn of 1917, just as the Bolsheviks seized power in the "10 days that shook the world," Robert Regel, head of the Bureau of Applied Botany, made Vavilov the institution's deputy head.

> As Regel wrote in his reference letter, "In the person of Vavilov we will employ ... a talented young scientist who would become the pride of national science." Regel's prediction turned out to be true. Since then, all Vavilov's life and creative work have been inseparable from the world's largest crop research institute, into which he transformed the Bureau in the 1920–30s. [3]

The USSR's seed collection was the biggest in the world.

The Bolshevik government renamed the Bureau the Department of Applied Botany. Vavilov took Regel's place as head of the Department after his death in 1920. He then moved to Petrograd, the city that would later be renamed Leningrad and is today called St. Petersburg, together with the Department's students and associates. In 1924 the institution's name was changed once again, this time to Institute of Applied Botany. In 1926 Vavilov founded the Pavlovsk Research Station, some 30 kilometers south of Petrograd, near the

Tsar's former summer palace, which went on to become the world's top agricultural research station.

His travels

From 1905 to 1915, Vavilov participated in botanical expeditions all over Russia's territory, from the European region all the way to Siberia. In 1916, in the middle of a world war, the Russian Tsar's Agriculture Ministry sent him to Iran and to Central Asia's majestic Pamir mountains, where the famed Silk Road used to run. He came back from this trip with valuable samples of legumes, including chick peas, lentils, peas, beans and clover. [4]

Agricultural biodiversity was very unevenly distributed in the world.

In 1921, when the Russian civil war had not even ended, Vavilov traveled to the Western hemisphere for the first time, visiting Canada and the United States in search of drought-resistant specimens, and on his way back stopping in England, France, Germany, Poland, the Netherlands and Sweden.

In 1924 he organized an expedition to Afghanistan, which became a true feat of Soviet geography. In this trip he determined that the country was a primary focus of crop formation, with a great diversity of major euroasiatic crops. The journey, full of hazards and vicissitudes, earned him the prestigious Przevalski medal of the Russian Geographic Society, which he would direct from 1931 to 1940. [5]

Between 1926 and 1927 Vavilov collected seeds in Syria, Palestine, Transjordan, Algeria, Morocco, Tunisia, Egypt, the banks of the Nile river, Ethiopia, Eritrea, Yemen, Cyprus, Crete, Sicily, Sardinia, Portugal, Spain, France and Greece. In this trip he took note of the great importance of legumes, especially chick peas, in nourishing both humans and farm animals and improving soil fertility. In 1929 he went to China, Korea and Japan's three major isles. In 1930 he returned to the United States, visiting Florida, Louisiana, Arizona, Texas and California, and then going south to Mexico, Guatemala and Honduras.

In 1932, using the occasion of the Sixth International Genetics Congress in the American city of Ithaca, Vavilov traveled through some 18 western states, from Washington and Oregon in the northwest corner, to Louisiana and Arkansas, from California and Arizona in the southwest to the Dakotas, and all states in between, and trekked through Canada from the Pacific coast all the way to Ontario. After that he went to Cuba, Yucatan, Ecuador, Peru, lake Titicaca, Bolivia, Chile, Brazil, Argentina, Uruguay, Trinidad and Puerto Rico. This was to be his last overseas voyage.

His theory

Vavilov noticed in his travels that agricultural biodiversity was very unevenly distributed in the world. While some places had an overwhelming diversity of plants, others had not much to offer. In the Mexican state of Oaxaca, for example, it is not unusual to find campesino garden plots with more corn varieties than in all of the United States, or indigenous farms in Peru and Bolivia with more potato varieties than in all of Europe. Vavilov decided to learn the cause of this phenomenon.

He concluded that the places with the most agricultural biodiversity have varied topographies, soil types and climates. Even more importantly, these tend to be surrounded by mountain ranges that constitute formidable geographic barriers. Mountains, like oceans, are an isolation factor that protects against the untimely invasions of exotic species, which tend to reduce biodiversity.

Vavilov determined that the world's agricultural biodiversity comes mostly from eight identifiable nuclei, which include China, Mexico-Guatemala, the Mediterranean basin, Indo-Burma and Central Asia. He referred to these as the centers of origin. Scientists today call them the Vavilov centers of diversity. Vavilov centers are irreplaceable centers of biodiversity and are essential for world food security. Any agronomist who wants to improve crop varieties must have access to specimens from their centers of origin. For example in the case of the potato, regardless of whether it is grown in Poland, Ireland or Idaho, it needs the genetic input of the extremely diverse varieties that grow in its center of diversity in South America's Andes.

Vavilov determined that the world's agricultural biodiversity comes mostly from eight identifiable nuclei.

Quoting from Pat Mooney's and Cary Fowler's seminal book *Shattering*:

> Genetic variation — the diversity created by thousands of years of agriculture — was not equally distributed around the globe. In a small, isolated pocket on the Ethiopian plateau, Vavilov found hundreds of endemic varieties of ancient wheat. Studying other crops, he found some regions blessed with astonishing diversity, while other areas were relatively impoverished. In the following years, observations by other scientists confirmed Vavilov's budding theory. While living in a suburb of Guadalajara, Mexico, Edgar Anderson noted that he found "more variation in the corn of this one little township than in all of the maize in the United States."
>
> Vavilov mapped out the distribution of this diversity for each of the crops he studied. He reasoned that the degree of diversity was indicative of how long the crop had been grown in that area. The longer the crop had been grown, the more diversity it would display. . . . By locating a center of genetic diversity for a crop, one pinpointed its origin, Vavilov reasoned. This was where the crop had originated and had had time and opportunity to de-

velop wide diversity. A plant's "'center of diversity' was thus its 'center of origin, '" he said. [6]

His enemies

Vavilov's story does not have a happy ending. The great heroes of science tend to have great enemies. Vavilov's own personal Lex Luthor was the Ukrainian pseudo-scientist Trofim Lysenko, who argued that genetics was a bourgeois science that aimed to provide a biological justification for class differences. Lysenko rejected the Mendelian ideas championed by Bateson and Vavilov and in their place favored an extreme interpretation of the theories of French biologist Jean-Baptiste Lamarck. Anxious to win Stalin's favor, Lysenko unleashed a campaign of slander and abuse against Vavilov and his "counterrevolutionary biology." In August 1940 Lysenko and his followers were finally able to persuade the authorities to arrest Vavilov and take him away to the gulag.

Lysenko unleashed a campaign against Vavilov and his "counterrevolutionary biology."

"Vavilov, the symbol of glory of national science, is at the same time the symbol of its tragedy. As early as the beginning of the 1930's his scientific programs were being deprived of governmental support. In the stifling atmosphere of a totalitarian state, the institute headed by Vavilov turned into a resistance point to the pseudo-scientific concepts of Lysenko. As a result of this controversy, Vavilov was arrested in August 1940, and his closest associates were also sacked and imprisoned. Vavilov's life ceased in the city where his star had once risen. He died in the Saratov prison of dystrophia on January 26, 1943 and was buried in a common prison grave." [7] After Vavilov's death, his prized seed collection was no longer under the custody of real scientists. Stalinist orthodoxy reigned supreme and Lysenko and his followers ran amok with the proverbial chips on their shoulders. The seed collection deteriorated as a result of neglect, and even today the Pavlovsk Research Station and Russian agriculture have yet to fully recover from the blow.

And then came the Nazis

Stalin's disdain for Vavilov's work was made manifest in 1941 with his refusal to protect his seeds from the advancing Nazis. The Soviet leader ordered factories in the path of the invaders to be dismantled and reassembled in safe territory east of the Ural mountains, but did not do likewise for the seed collections. However, unlike Stalin and Lysenko, the Nazis did appreciate the importance of those seeds.

The German SS had a unit called Ahnenerbe, made up of intellectuals, scientists and explorers, kind of a Nazi version of National Geographic. Theorizing that all of human history had been little more than a struggle between Nordic and Semitic peoples (the latter being, of course, the "bad guys"), Ahnenerbe sent out a number of anthropological expeditions to various locations before and during World War Two. Its expedition to Tibet in 1938–1939, was immortalized in a book written by one of its members, Heinrich Harrer, titled *Seven Years in Tibet*. It became an American bestseller in 1954 and was made into a film in 1997.

Ahnenerbe's leadership knew about Vavilov's seeds, understood their priceless value and intended to seize them in order to give the Third Reich unrivaled supremacy over world agriculture (not very different from what Monsanto intends to do nowadays). Nazi intellectuals interpreted Mendelian genetics as validation of Nazism's concepts of racial purity.

In June 1943, in the wake of the Germans' defeat at Stalingrad, Ahnenerbe sent a detachment to Ukraine led by botanist Heinz Brücher to get hold of the Soviet seed collections. The captured seeds were taken to an Austrian castle near the city of Graz.

But the majority of Vavilov's seeds were stored at the Pavlovsk Research Station. The city was besieged by the Nazis for two and a half years, and its resistance was one of the most heroic episodes not only of World War Two, but of the twentieth century. The Germans seized the Pavlovsk station but Brücher's unit did not find the coveted seeds. These had been moved by Vavilov's colleagues to a location within the city. They guarded them with their lives, as they knew full well that if the Nazis ever captured them all of Vavilov's work would be lost forever, and if they won the war they would not have seeds with which to regenerate Soviet agriculture. They also had to protect the seeds from the hungry population — over one million people died during the siege, many of them of starvation. At least a dozen scientists starved to death while guarding the seed collection.

Unlike Stalin and Lysenko, the Nazis did appreciate the importance of those seeds.

> In the spring of 1943 the defeat of the sixth army in Stalingrad sealed the fate of the Eastern front and signaled the start of the German retreat. The deaths of over 127,000 soldiers and the capture of another 90,000 by the Soviet army worried the German high command. But something else called its attention. Biological field stations, spread between Minsk and the Crimean peninsula, in territory still occupied by the Germans, would soon fall into Russian hands. The seed collections in some of these stations included, apart from improved varieties and local samples, duplicates of the collections that Vavilov had compiled during his expeditions all over the world.
>
> On June 16 1943 Brücher and a detachment of special troops initiated the recovery of these collections. At the Sinelnikovo station they found duplicates of the world collection that Vavilov had put together in Leningrad and, among many other

things, many samples of corn varieties from Mexico and Central America... In the summer of 1943 Brücher planted several samples of barley and wheat, concluding that by 1945 he would have improved seeds.

This story has more than one connection with Mexico. In the 'rescued' collections in the stations in Ukraine there were samples of corn, beans, and other crops that originated in (Mexico), taken by Vavilov to Leningrad. The duplicates in Sinelnikovo included diverse landraces of Mexican corn. [8]

At least a dozen scientists starved to death while guarding the seed collection.

The irony of it all was that while Brücher accorded great value to these collected seeds, the Soviet authorities preferred Lysenko's ideology and his primitive Lamarckism.

The Soviets defeated the Nazis. The Germans never took Leningrad and never got their hands on the Pavlovsk station seeds. The stolen seeds from Sinelnikovo and other stations were recovered, and on top of that the Soviets took control of Germany's Gatersleben agricultural station, which housed a seed collection whose first samples were collected in the days of the Kaiser.

Brücher survived the war and migrated to South America. In 1948 he was named professor of the University of Tucuman in Argentina and in the years that followed he also taught in Paraguay and in the Argentinean cities of Mendoza and Buenos Aires, and authored several books on botany and agriculture. His murder in Mendoza in 1991 is the subject of several conspiracy theories. [9]

Vindication

After Stalin's death, members of the Soviet scientific community started to speak openly against Lysenko. In 1962 physicist and astrophysicist Yakov B. Zel'dovich, astrophysicist Vitaly L. Ginzburg, a Nobel prize winner, and physicist Pyotr L. Kapitsa, also a Nobel laureate, publicly declared that Lysenko's work was a fraud. Two years later, nuclear scientist Andrei Sakharov, who would win the Nobel peace prize in the following decade, accused Lysenko of pseudoscience and defamation and held him responsible for the firings, arrests and deaths of real scientists. [10]

Lysenko died in 1976, discredited and disgraced. Today his theories are generally considered fraudulent. Quite deservedly, Lysenko lived to see Vavilov posthumously exonerated of all charges against him and given due honor. In 1968 the Institute of Applied Botany that he led was renamed after him.

His legacy lives

Vavilov's feat was never repeated. No other individual has ever launched an effort of similar proportions to collect, catalogue and classify the world's agricultural biodiversity. His theories about the geographic distribution of crop biodiversity have passed the test of time and are accepted by biologists and agronomists all over the world.

The Soviets kept Vavilov's legacy of botanical expeditions alive. In 1991, year that the USSR collapsed, there were Soviet seed expeditions to Egypt, Portugal, the Madeira Islands and Costa Rica. [11]

There were also many expeditions within the vast and astonishingly diverse terrain of the Soviet Union. In a single year, 1986, explorers from the Vavilov Institute collected seeds from Kaliningrad, Astrakhan, Ukraine, Crimea, Moldavia, Georgia, Azerbaijan, Uzbekistan, Tajikistan and Sakhalin island in the Pacific Ocean just north of Japan. There were also many instances of cooperation with other socialist countries. There were expeditions to Poland, Bulgaria, Czechoslovakia and East Germany with the full participation of local agronomists and botanists. And in 1990 Mongolia received a joint USSR-Czechoslovakia-Bulgaria seed expedition with local experts, that searched for forage grasses and wheat. The Soviet Union also received expeditions from these socialist countries. In 1981, for example, Soviet and Polish scientists collaborated in searching for seeds in various Soviet territories, including Krasnodar, North Ossetia, Dagestan, Azerbaijan and Georgia, and obtained 350 samples of cereals, legumes and forage grasses. [12]

The expeditions continue to this day. In September and October 2011 the Vavilov Institute sent out an expedition to the former Soviet republic of Tajikistan, which obtained samples of local melon, gourd, watermelon, cucumber, carrot, tomato, onion, beet, radish, basil, celery and dill. This venture was jointly carried out with two private Dutch companies, which seems to indicate that the Institute is turning to public-private partnerships in order to make up for poor public funding. [13]

His theories about the geographic distribution of crop biodiversity have passed the test of time.

After facing formidable foes like the Third Reich and Lysenko's pseudoscience, Vavilov's work keeps finding new enemies. In 2010 part of the Pavlovsk agricultural station was going to be razed by a developer who wanted to build houses there. The station and its 1,200 acres of fields can rightly be considered one of the marvels of the modern world.

The Pavlovsk Research Station houses one of the world's largest collections of seeds and planted crops, roughly 90% of which are found in no other scientific collection in the world. The station's inventory includes almost a thousand types of strawberries from more than 40 countries; a similar number of black currant varieties from 30 countries, including North America, Europe and the Far East; 600 apple types collected from 35 countries; and more than a hundred varieties each of gooseberries,

cherries, plums, red currants, and raspberries. More than half of the black currant varieties grown in Russia, the world's leading producer, were bred at Pavlovsk. Sales of black currants in Russia are valued at more than $400 million annually. [14]

After an urgent international campaign for the station's protection, Russian president Medvedev declared he would take a look into the matter. The construction project has apparently been shelved indefinitely.

If he were alive today, Vavilov would be considered a vile biopirate.

Questions for the future

There is no doubt that if he were alive today, Vavilov would be considered a vile biopirate. The times have changed. The last quarter century has seen the rise of a critical consciousness among indigenous peoples, campesinos and the most diverse civil society sectors with regards to how seed collection endeavors carried out over the centuries by great empires and highly industralized societies have resulted in homogeneous agricultural systems based on monocultures, which represent the very denial of biodiversity and sustainability. The disastrous consequences of this mode of agricultural production have been exhaustively documented, at least since the pioneering work of Murray Bookchin and Rachel Carson in the early 1960's. In 2008 the massive and thoroughly documented IAASTD report, comissioned by the United Nations and the World Bank, made it very clear in its conclusions that the current model of modern agriculture exacerbates global warming and world hunger. [15]

Seeds are today an object of conflict and bitter controversy because of the blunt efforts of life sciences corporations to appropriate them through so-called intellectual property rights, which are legitimized by neoliberal ideology and enforced by legally binding free trade agreements. This is why nowadays the mere act of collecting seeds has come under suspicion among many local populations all over the world. Today Vavilov would not be well received in many of the places where he collected seeds.

This leads to several questions to which I hope to find satisfactory answers someday. What is the Vavilov Institute's position on the controversy around biopiracy and patents on seeds? What are its positions on genetically modified crops, organic-agroecological production, food sovereignty, or the findings of the IAASTD report? I harbor no illusions. Agricultural research centers tend to be very conservative in subjects like these, if they address them at all. Critiques of conventional industrialized agriculture do not flow from these research centers. Quite the contrary, these have most often been bulwarks and redoubts of resistance to change.

Maybe the Vavilov Institute has not been the target of protests against the patenting of seed because in this matter the worst offender by far has been the United States and its life sciences corporations, followed closely by their European counterparts. And with the decline of the G7 and the rise of the emerging economies, we'll probably be seeing soon seed expeditions launched from countries such as China, India and Brazil.

If he were alive today, Vavilov would be marching along with the member organizations of Via Campesina and the advocates of food sovereignty and against the Monsantos of the world. At least, that's what I would like to think.

Professor Ruiz-Marrero is a Puerto Rican author, investigative journalist and environmental educator. He is a research associate of the Institute for Social Ecology (http://www.social-ecology.org/), a fellow of the Oakland Institute (http://www.oaklandinstitute.org/), and director of the Puerto Rico Project on Biosafety (http://bioseguridad.blogspot.com/). His bilingual web site (http://carmeloruiz.blogspot.com/) and list server (http://groups.yahoo.com/group/carmeloruiz/) are devoted to environment and development issues of global relevance. His Twitter ID is carmeloruiz.

Notes

1–2. Vavilov Institute of Plant Industry. Objectives and tasks of the Bureau, 1905-1920. http://vir.nw.ru/history/1905-1920.htm#objectives
3. Vavilov Institute of Plant Industry. *Biography of Nikolai I. Vavilov*. http://vir.nw.ru/history/vavilov.htm
4. Vavilov Institute of Plant Industry. N. I. Vavilov's expeditions http://vir.nw.ru/history/vavilov.htm#expeditions; PGR Newsletter, issue #124. The significance of Vavilov's scientific expeditions and ideas for development and use of legume genetic resources. http://www2.bioversityinternational.org/publications/pgrnewsletter/article.asp?id_article=6&id_issue=124
5. Vavilov Institute of Plant Industry. Biography of Nikolai I. 5 Vavilov. http://vir.nw.ru/history/vavilov.htm
6. Pat Mooney & Cary Fowler. *Shattering*. http://www.ecobooks.com/authors/vavilov.htm
7 Vavilov Institute of Plant Industry. *Biography of Nikolai I. Vavilov*. http://vir.nw.ru/history/vavilov.htm
8 Alejandro Nadal. Los maíces de Stalingrado. *La Jornada* (Mexico), August 24, 2005. http://www.organicconsumers.org/espanol/240805_maiz.htm
9 La Gaceta, July 22, 2011. *Comando SS busca semillas para dominar el mundo*. http://www.intereconomia.com/noticias-gaceta/internacional/internacional/heinz-bruecher-comando-ss-busca-semillas-para-dominar-mu ; Mariana Guzzante. El extraño caso del biólogo de Adolf Hitler. Los Andes, December 21, 2008. http://www.losandes.com.ar/notas/2008/12/21/estilo-399551.asp
10 Norman Qing Ni Li & Yuan Jian Li. *Biography of Andrei Sakharov*. http://www.learntoquestion.com/seevak/groups/2003/sites/sakharov/AS/biography/dissent.html
11 Vavilov Institute of Plant Industry. *Major collecting missions to foreign countries*. http://vir.nw.ru/history/exp_for.htm
12 Vavilov Institute of Plant Industry. M*ajor expeditions within the former USSR*. http://vir.nw.ru/history/exp_su.htm

13 Vavilov Institute of Plant Industry. Report on the joint collecting mission to Tajikistan in the period from 20 September through 7 October 2011. http://vir.nw.ru/collecting_missions/24.10.2011 en.html ; Louis Werner. *Seeds of High Asia. Saudi Aramco World*, Jan-Feb, 2012. http://www.saudiaramcoworld.com/issue/201201/seeds.seeds.of.high.asia.htm

14 Cary Fowler. The second siege: saving seeds revisited. *Huffington Post*, August 18, 2010. http://www.huffingtonpost.com/cary-fowler/the-second-siege-saving-s_b_685867.html; Fred Pearce. New hope for Pavlovsk Station and Russia's rare plant reserve. Environment 360, September 20, 2010. http://e360.yale.edu/feature/new_hope_for_pavlovsk_station_and_russias_rare_plant_reserve/2320/

15 International Assessment of Agricultural Knowledge, Science and Technology for Development. April 2008. http://www.agassessment.org/; http://bioseguridad.blogspot.com/search/label/IAASTD

Occupy Monsanto: Occupy the Dialectic

by Don Fitz

According to Carmelo Ruiz-Marrero, Western powers have been grabbing seeds from the global South for centuries in order to develop new plant breeds. His talk provided a political and historical context to the current global battle around the patenting of seeds and crops with genetically modified organisms (GMOs).

It was September 16, the first day of GMO-Free Midwest, the St. Louis portion of Occupy Monsanto. On the panel with Carmelo was Dr. Ollie Fisher, whose first job after getting his Chemical Engineering degree was working at Monsanto. He left that position after becoming distressed with the way the company uses its technology to coerce Africa into producing food that compromises human health.

Priti Gulati Cox also joined the panel "GMOs as a Weapon of Global Domination." She described effects of GMO crops on her native India. Monsanto advertises heavily to persuade farmers to switch to its new wonder seeds. After multiple crop failures, thousands of Indian farmers have gone bankrupt and committed suicide.

The following day, September 17, Occupy Monsanto sponsored actions across the globe. Beginning with a day of panels, the St. Louis event encouraged a dialectical interplay between thought and action. Occupy Wall Street (OWS) had expanded the practice of having discussions interspersed with activities. Panels and lectures provide core information. Demonstrations, marches and direct actions "concretize" or give meaning to ideas.

Rich Martin threatens to throw out organizers & journalists. Photo: Petermann/ GJEP

Post-activity discussion helps "synthesize" the thought/action dichotomy.

… people of color in the Global South are most often forced to give up sustainable agriculture …

Nowhere are these processes more important than in combating GMO contamination of food. Several contradictions confronted organizers of GMO-free Midwest.

Contradiction 1. Currently, safe food is viewed largely as a white intellectual concern in the US. This creates an enormous contradiction because farmers, and especially peoples of Latin America, Africa and Asia most affected by the international campaigns of agribusiness. Today, it is people of color in the Global South who are most often forced to give up sustainable agriculture and adopt industrial growing methods.

Multi-ethnic panels strengthen the movement as participants realize that they share a common opponent with their allies. But, until the US safe food movement becomes truly multi-ethnic, its effectiveness will be severely limited.

The St. Louis forum covered the basics: Daniel Romano described Monsanto's role in advancing herbicides and pesticides; Suzanne Renard looked at the specific effects of chemicals on bees; Stan Cox went into the big picture of industrial agriculture; and, Eric Herm gave a personal account of a farmer making choices about using GMOs. Anne Petermann linked these US experiences, the global advance of genetically engineered trees, and the cur-

Irina Ermakova, a leading scientist at the Russian Academy of Scientists, joins GMO-Free Midwest picket. Photo: Don Fitz

rent push to drive indigenous forest protectors from their homes.

Contradiction 2. The time is more than ripe for safe food efforts to move from symbolic to substantive actions. Symbolic actions are necessary for building a movement. The Gateway Green Alliance (GGA) continually meets people coming from the other side of town or from across the globe because marching at its world headquarters is personally significant for them. Never underestimate the importance of ritual. Whether singing, chanting, standing in a circle, or picketing Monsanto, symbolic actions strengthen the bonds of community.

Yet, picketing Monsanto World Headquarters (MWH) is not substantive — if there were a thousand times as many pickets, it would not affect Monsanto's profits. A substantive action against Monsanto would interfere with its functioning in some way. It is difficult (but not impossible) to organize substantive actions against Monsanto because it distributes to other companies rather than to consumers. But Whole Foods Market (WFM), a newly arrived stepchild in the Monsanto extended family, distributes directly to consumers. This makes it a potential target for substantive actions. Even more so because those who shop at WFM think that higher prices buy them better quality food. WFM customers very often suffer the illusion that it does not sell GMO food.

A picket in front of WFM or signs on top of cars in its parking lot are symbolic actions which may irritate its management but do not interfere with its business. In contrast, a shop-in slows down the check-out line as participants ask if each item contains GMOs. It is substantive because of its potential. If thousands of people were to participate in dozens of cities, sales at WFM would plummet. Facing a potential boycott, WFM might reverse its hidden love affair with Monsanto and begin labeling GMO foods.

Contradiction 3. In seeking to make the WFM action more substantive, organizers faced the contradiction of openness vs. guardedness. Everyone agreed on guardedness. After the 2003 Biodevastation 7 Gathering in St. Louis, an ACLU inquiry discovered our personal emails in files of Homeland Security, which had been working with Monsanto. Similarly, several reports on OWS actions in 2011 noted how police knew of plans before events happened.

A guarded approach in 2012 meant not putting details of the shop-in on the website or in email or discussing them during phone calls. As a result, police and WFM management had no idea of what we were doing until we were in the middle of doing it.

But there was a downside. More open planning has the advantage of reaching a larger number of people eager to participate in direct action. Discussing plans with everyone weeks in advance gives them a chance to rehearse it in their minds. In our post-action discussion, we covered ins and outs of how the shop-in went and how it could be improved on. These thoughts are now being shared via personal contact with multiple organizations.

One type of open inclusiveness did not enter into planning because it recently proved so damaging to OWS. That is "consensus decision-making" by dozens or hundreds of people who come to a General Assembly. It has the advantage of empowering people who have been excluded from corporate society. But it means that weeks of planning can be thrown out the window by 1 or 2 people who may have little commitment to the movement but decide to "block."

The time is more than ripe for safe food efforts to move from symbolic to substantive actions.

Consensus is not only useful but necessary when practiced by a direct action group willing to risk arrest or coordinators who must make on-the-spot decisions during an action. Consensus by an undefined membership is so self-destructive that it is time to give it a belated burial.

Occupy Monsanto can become stronger by building on and learning from Occupy Wall Street. To grow, it needs to carry out more substantive actions. Collective self-reflection on how to build a multi-ethnic movement, how to undermine the power of agribusiness, and which tactics are most effective are the foundation of synthesizing our knowledge and experience. It is also essential for our most important goal — contemplating the type of new society we wish to build.

… police and WFM management had no idea of what we were doing until we were in the middle of doing it.

Banner hung across the street from GMO industry conference. Photo: Sandy Griffin

"Stop Talking or You Will Be Removed from the Hotel"

As we began the second day of "GMO-free Midwest," we found that the Millennium Hotel had moved us to the other side of the floor. The new room was half the size of the one we had paid for. Conference coordinator Barbara Chicherio went to find the supervisor in charge. On the other side of a roped off area guarded heavily by hotel security were attendees of the industry-backed "International Symposium on Biosafety of GMOs."

It appeared that the Millennium Hotel was as interested in making sure that we did not contaminate its audience as we were interested in preventing GMOs from contaminating the environment.

"Sir, are you in charge here?" Barbara asked. "Uptight" can barely describe the Millennium supervisor who starred back at her, stiff as a board. "I need to talk to you," she continued. "Why were we moved from the room we rented?"

There was no answer.

"And why were we moved to the far end of the hall? And why were we put in a room half the size of what we paid for?" And when can we get the table to go up in front of the room for the book signing that I explained we were having?"

"Did you read your contract?" finally came the response from the cardboard supervisor. "Read the BOE part of your contract."

"What does that have to do with our being moved to a smaller room?"

"If you don't stop talking to me, I will have you removed from the hotel," was the most thoughtful answer he could come up with. His name tag read "Rich Martin, Director of Catering and Convention Services."

Orin Langelle with the Global Justice Ecology Project (GJEP) pulled out his camera to film the interaction. Rich put up his hand, growling "No photos! You get away from me or I'll have you removed from the hotel." Nearby, Anne Petermann slid her camera away as she quietly caught Rich on film.

Months before, Barbara heard that a major pro-GMO symposium would be happening in Monsanto's home town of St. Louis during September 16–20. Greens thought that it might be interesting to have an event critical of GMOs at the same time and place.

In St. Louis, virtually every large institution has received major funding from Monsanto. There is a history of people reserving hotel or college space for events critical of Monsanto having to confront the problem of rent zooming up or other pressure to leave the location.

With a contract signed months in advance of the event, we went to the National Lawyers Guild (NLG) to ask about our legal options if history were to repeat itself. One of the many pieces of useful information the NLG gave us was that the hotel would have the right to prevent us from entering if we were wearing T shirts with slogans they did not like. So, we covered our T-shirts with jackets before entering and took jackets off once inside.

Just as we were about to begin the panel, a woman came in wearing a name tag of the Biosafety Symposium. We wondered if she wandered into our room by mistake. She introduced herself as Dr. Irina Ermakova and said she wanted to find out about our forum.

The author of some of the most important papers documenting dangers of GMOs, Dr. Ermakova is a Russian scientist who replicated work of Dr. Arpad Puztai. Dr. Puztai gained notoriety in 1998 when after reporting his research finding damage to the gut of rats fed GMOs. He had been a supporter of GMOs prior to his research but announced that he would never eat them after what he discovered. His employer, the famed Rowett Institute, then suspended him. Later, it came to light that Monsanto had given Rowett Research Services a grant of $224,000.

… events critical of Monsanto confront the problem of pressure to leave the location.

Dr. Ermakova found that offspring of female rats who had been fed GMO soy had a death rate of 50% within three weeks of birth. The death rate of infant rats whose mothers had eaten non-GMO soy was 10%. Offspring of GMO-fed rats were smaller and unable to reproduce when they reached adulthood. After reporting her findings, Ermakova experienced frequent verbal abuse from biotech enthusiasts and discovered charred remnants of papers placed in her office. We delayed the panel on "Green Economics: Reality vs. Fantasy" so that Dr. Ermakova could review her research and concerns with GMO food.

The final panel of the conference explained how GMOs are part of an overall thrust by neoliberalism to control the world economy. Orin spoke of

the tragedy of Monsanto workers dying from chemical poisoning in addition to the contamination of entire communities. He detailed how false solutions for climate change such as the Green Economy and Reducing Emissions from Deforestation and Forest Degradation (REDD) only serve to make corporations richer.

Dr. Ermakova found that offspring of female rats who had been fed GMO soy had a death rate of 50% within three weeks of birth.

I pointed out that, during the twentieth century, the food industry faced the problem of how it could continue to grow once it became possible to feed the entire global population. It invented needs for pesticides, herbicides, processing, packaging, storing, advertising, and genetic modification, none of which increased the nutrition of food. The food industry is typical of other areas of production, which have grown not by improving people's lives, but by developing wasteful and destructive processes and products.

With the discussion portion of GMO-free Monsanto over, we went across the street and were joined by large puppets of mutant GMO corn and pesticide resistant larva. A banner was soon hung from the fourth floor of a neighboring parking building which read "THE WORLD DOESN'T WANT YOUR GMOs" A few minutes later we were joined by Dr. Irina Ermakova who posed by our pickets for a photo that ran in the *St. Louis Post-Dispatch* the next day.

"Ma'am, Please Don't Take Off Your Shirt in the Parking Lot"

Several dozen people went from picketing the industry-sponsored "Biosafety" symposium at the Millennium Hotel to Whole Foods Market (WFM) in Brentwood, Missouri. The action at WFM built on previous demonstrations and caught store management and local police completely off guard.

June 9 had seen a creative picket of WFM that provided an opportunity to talk with WFM workers who have been led to believe that the store does not sell GMOs. A few shoppers joined the picket upon learning that WFM brags that it labels GMO food when it only labels non-GMO food, leaving customers uninformed about potentially contaminated products.

On August 18 a new tactic challenged WFM. WFM aggressively censors "soliciting" which it says includes telling customers of dangers that GMOs poses to health and the environment. So, we went into its parking lot with signs on top of cars saying "GMOs Contaminate Food" on one side and "WFM Sells GMOs" on the other. Other cars had the same message on window signs or on home-made bumper stickers.

Police told drivers that they could not enter the parking lot with "protest signs" on their cars. But they were hard pressed to explain what was and what was not a protest sign. They were particularly befuddled at trying to figure out if they should order the removal of bumper stickers, since so many cars at WFM have safe food slogans on them. As we discussed what constitutes a protest message, other drivers came in, parked, and let their cars with signs on top remain throughout the afternoon.

A new level of action. On September 17, we took activities at WFM to a higher level. A few carried signs on the sidewalk. But most walked to the front of the store.

"If you are here to protest, you need to go to the sidewalk," the police motioned. I buttoned up my jacket over my "Genetic Engineering — Don't Swallow It" T-shirt and walked through the police. Since we didn't appear different from typical WFM customers, others in our group did the same.

Some said, "I just came here to pick up a few items" as they walked past the police, who were again unsure of what to do.

Apparently warned that we would be there, WFM staff could be heard saying "What's happening? They're all coming in to shop." Safe food activists wandered through the store looking at labels carefully. They did not put items in their carts if they read, "GMO-free," "organic," or "365," which is the WFM house brand.

… the food industry faced the problem of how it could continue to grow once it became possible to feed the entire global population.

As shoppers went through the check-out line, they picked up each item and asked the cashier if it had GMOs in it. If so, it went in the "don't buy" pile. Cashiers often weren't sure; and that meant it also went in the "don't buy" pile. One cashier

Activist ties up the checkout line at Whole Foods by asking the clerk whether each of the items in her cart contains GMOs. Photo: Langelle/GJEP

claimed that everything WFM sold was GMO-free, which led to each item in turn being put aside by a disbelieving shopper.

Shoppers took the opportunity to explain our concerns to every employee. And there is no better opportunity to discuss potential food contamination than doing so with a customer waiting behind you in line. WFM is particularly vulnerable to such a tactic because the vast majority of its customers are concerned about food quality.

From chatting with us, customers found out that, though WFM products cost more than those at other grocery stores, they are very likely to contain GMOs. With a bad rep for extreme anti-unionism and buying out competitors in order to destroy them, WFM is also resented for reversing its former opposition to GMO foods. It now babbles about "informed customer choices" but fails to inform customers by labeling food that might have GMOs.

… shoppers picked up each item and asked the cashier if it had GMOs in it.

From Shop-In to Talk-In. Many safe food shoppers asked for the manager to come and verify whether food in their cart was GMO-free. At one point, a frazzled manager began grabbing handfuls of food and pushing it aside, saying "Yes, all this food has GMOs." The manager seemed obsessed with keeping the check-out lane flowing as rapidly as possible.

Managerial distress was caused by two dictums: WFM policy says that every customer question must be answered; and, WFM also says that shopping must be a "pleasant experience." But the shopping experience might be made unpleasant either by a slowed check-out line or by customers watching someone being hassled by police for the crime of asking if food quality is compromised. This particular manager decided that pleasant shopping would best be maintained by confirming that a large amount of WFM items might be contaminated with GMOs.

The National Lawyers Guild (NLG) had told us that WFM could order us to leave and those who refused could be arrested. But it would have been impossible for WFM to determine who constituted "us." WFM could have brought police from inside to harass those they thought were "protestors." But doing so would run the risk of intimidating everyday customers who go to WFM concerned with the quality of food and happen to ask a question or two about what they are buying. Its liberal façade again makes WFM more vulnerable to a shop-in than any other supermarket chain.

Our friendly shoppers left the store with a single purchased item, confirming that they were, in fact, WFM customers. Others asked what all the commotion was about and what we were trying to accomplish. Some asked if they should boycott WFM. We explained that they could help lay the groundwork for a future boycott by telling everyone they knew about the true face of WFM.

The WFM ban on "solicitation" had been broken in store aisles, in check-out lines, and at the store entrance. Unable to distinguish "protestors" from "legitimate" customers, neither WFM management nor Brentwood police could stop people from asking "Why should we be concerned about what we buy at WFM?" Getting people to ask that question was the point of the action.

From Talk-In to Gawk-In. A foam-board sign with holes for zip-ties can be fastened with bungy cords to the top of a car in 10–15 seconds by people who have practiced doing it. As cops and store managers were trying to figure out if they could do anything about the growing number of GMO conversations among customers, two people tied a six foot long sign saying that "WFM Sells GMOs" atop a station wagon. By the time the cops figured out what had happened, the two were long gone.

Eric Herm, anti-GMO cotton farmer from Texas, stands by car sign in Whole Foods parking lot. Photo: Petermann/GJEP

Cops walked over and asked the people looking at the car who owned it; but they just shrugged their shoulders. Most picketers left their sidewalk location to see what the cops were doing. Friendly shoppers walked toward the car. Customers drifted over to hear everyone asking about why police were concerned that a car had a sign on its hood.

There are few things that people gawk at more than cops looking at something while a small crowd looks at the cops. Barbara Chicherio asked what bothered them. "Protest signs need to be on the sidewalk and not on cars," a cop huffed.

Barbara described the car signs, window signs and bumper stickers, asking

which needed to be removed. The cop scowled. Remembering that she was wearing a "Millions Against Monsanto" T-shirt, she had a flash: "Officer," she asked, "If everything critical of Whole Foods and Monsanto is a protest sign, do I have to take off this T-shirt?"

"Ma'am, please do not take off your T-shirt in the parking lot!" The crowd laughed and even the cop chuckled. The absurdity of trying to wrestle through the twists and turns of exactly what type of free expression WFM could suppress was too much.

Effects of the police presence had turned into their opposite. Intended to be soft-core harassers, the police were less than totally dedicated to protecting WFM customers from the horror of people asking about food contamination. The show of police force served to increase discussion about WFM, thereby furthering goals of the action.

Within half an hour of the mini-confrontation in the parking lot, the police gave up efforts to get the sign off the car and walked off. Soon the crowd drifted away but the sign remained until the end of the action. Having reached over 10 times as many WFM workers and customers as all previous efforts combined, safe food shoppers boarded a bus and cars headed for their final destination of the day: Monsanto World Headquarters in Creve Coeur, Missouri.

"Rats Who Eat 'em Already Know…"

The Gateway Green Alliance/Green Party of St. Louis has over 10 years of experience picketing Monsanto World Headquarters (MWH). Long before the company was contaminating and dominating the food supply, it was producing toxic chemicals such as PCBs for insulation and Agent Orange for the Vietnam War. Its herbicide Roundup links its chemical past to its present focus on genetically modified organisms (GMOs). Two-thirds of GMOs are created to make herbicide- and pesticide-resistant crops.

With two highly successful events, safe food activists expected the demonstration at Monsanto to be an uneventful repeat of the many actions held previously at that location. It was not. For years, the company had pretended to be accepting, even having pitchers of water and cups prepared for protestors on some occasions. But not on the day of Occupy Monsanto.

… safe food activists expected the demonstration at Monsanto to be uneventful.

No corporate greeters were on hand. A sparse line of police stood in military rigidity behind yellow rope. One cop walked over, saying, "You can demonstrate on your side of the rope as long as you stay on the grass and don't step on the pavement."

As he swaggered away John Wayne-style, a woman muttered to me, "Last time I was here they ordered me to stay on the pavement and not get on the grass."

Monsanto had a history before GMOs.
MWH, Sept 17 2012. Photo: Don Fitz

Among the many banners and signs were three sets of signs that had to go in the right order if they were to make sense to motorists driving 40–60 mph down Olive Blvd. Each sign had 1 or 2 words:

"WHY IS – MONSANTO – SUING – FARMERS?"
"STOP – MONSANTO's – GENETIC – CONTAMINATION – OF OUR – FOOD"
"WHY IS – MONSANTO – PUSHING – FOOD THAT – RATS – WON'T EAT?"

I asked several people to go to the other side of the road and be sure to comply with police wishes for us to cross over at the light. Several came back saying a cop had told them that they had to stay on this side of the road and could not cross over. "It must be my friend, John Wayne," went through my mind.

National Lawyers Guild (NLG) observer Maggie Ellinger-Locke asked the cop about his interpretation of safety law and he replied, "Oh, yes, you can be on the other side of the road, as long as you stay on the grass." Maggie and I glanced at each other, both aware that an argument explained by an attorney can be effective while the same statement put forth by an average citizen can be ignored.

That problem was solved and everything was going dandy. So, the cops invented a new problem. "Cars in Stacy Park can be towed if the driver is not using the park," they told us.

Monsanto World Headquarters is at two busy streets and the few neighbors are a church and businesses that have ties to or dare not offend the Biotech Master. Parking is a real hassle. For years, no one cared if people left their cars at Stacy Park, especially at the time of day of our picket when the park is barely used. So off went several people to

move cars, somewhat suspicious that Creve Coeur police might not be completely neutral defenders of public safety.

What a great victory it was! For years, Monsanto had judged us to be such a minor nuisance that they could ignore us or mock us with the feigned graciousness of water pitchers. But this day was different. For the first time, Monsanto was so much against the wall from global opposition that it felt the need to harass the picket at its front door.

Political activists do not use the word "transcend" to mean that someone's mind is going into outer space, disconnected from reality. "Transcend" means to include while going into a deeper meaning. Occupy Monsanto was becoming transcendent. It included the basic concerns that people have with human health — the poisoning of our food and our families. But it went beyond personal experience and linked up people across the globe.

Those who had lost a family member due to poisoning while working for Monsanto. Low income communities of color which have become uninhabitable due to toxic releases. Veterans who still suffer from Agent Orange as well as Vietnamese who endure ghastly effects. Farmers who fear their land being invaded by seed police. Argentineans who see once diverse fields turned into Roundup-ready monocultures. Africans who watch traditional cultivation wisdom ploughed under mounds of greed. Indians whose neighbors commit suicide following GMO crop failures. On September 17, 2012, those who simply want to feed their families safe food knew that they had allies throughout the world and that they must stand with these allies if they are to win the quality of food they want.

One person who did not stand in solidarity was the woman going around with a camera obtrusively filming each demonstrator. As she walked up wearing a stern look, Crystal Washington asked, "Hey, why you got that gun on your hip?" Crystal is the Green Party Committeewoman for Ward 4 of the City of St. Louis.

"Hey, why you got that gun on your hip?"

Wearing no identification connecting her with Monsanto, Homeland Security, or local police, the woman did not answer but continued to film. Nor would she answer anyone else who requested that she identify herself.

Truly, the biotech company was not putting on its happy face for Occupy Monsanto.

As the departing hour of 5:00 pm approached, I asked Maggie to join me in posing a question for officer John Wayne. Standing well on the other side of the yellow rope, he yelled out asking what we wanted. I motioned for him to come over, indicating the seriousness of the question. "Officer, there is something that you could help us with. We would like a group picture and wonder if you could snap it so we could all be in it." I held my camera toward him.

"We don't do photos." He strutted off.

Oh, well. He had the chance to transcend his John Wayne role; but, he blew it and will never go down in history as the officer who took the culminating photo at Monsanto World Headquarters.

During the entire event at Monsanto, reporter Charles Jakko had his mobile TV antennae extended 20–30 feet in the air for recording. Jakko is the reporter known internationally for interviewing Todd Akin, the candidate for US Senator from Missouri who educated the world on "legitimate" rape.

As people were putting their signs in a pile, Jakko's cameraman shouted, "You're not leaving, are you?"

"Yes, people want to be on the bus by 5," I told him.

"We were going to show you live on the 5:00 news!" the cameraman let me know.

A quick huddle and we decided to march in a circle for the live shot. Rain dribbled down at first but slowly got heavier each minute we got closer to the taping. Remembering what she learned from the panel discussions, Crystal came up with the background chant as Jakko put us on the air…

For the first time, Monsanto felt the need to harass the picket at its front door.

"Rats who eat 'em already know,
GMOs have got to go!"

A few minutes after 5 and the camera shut down; rain was heavier; and people were off to the Community Arts and Movement Center (CAMP) for the final wrap-up and reflection.

Crystal Washington at MWH, Sept 17 2012. Photo: Don Fitz

At Biodevastation 7 in 2003, CAMP was one of several locations raided by St. Louis police for the Monsanto-inspired hallucination that we were bringing 50,000 anarchists to destroy downtown. In 2012, Anne Petermann had come from New York to speak at GMO-Free Midwest. Explaining that she was originally from St. Louis, she let everyone at CAMP know, "Today, I was told that I was unwelcome at three different locations. It feels just like the St. Louis I left. It's so good to be home."

Don Fitz helped plan GMO-Free Midwest and is active in the Greens/Green Party USA.