bought the boiler from an operation owned by Oliver Ridgely south of Taylorsville on Route 27, and the distillation kettles came from the E.W. Pickett still on John Pickett Road in Woodbine.

The wormseed still at the Farm Museum will never be operational because of the condition of the boiler and the cost of bringing the unit up to code. Additionally, there are safety considerations for such an operation, not to mention the near impossibility of obtaining environmental and operating permits. However, the equipment does provide historical and accurate evidence of a bygone industry and of the people devoted to the cultivation of this cash crop "weed" that once thrived in Carroll County.

Robert Day's wormseed still in its new home at the Carroll County Farm Museum, 2017. (HSCC photograph.)

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WORMSEED: CARROLL COUNTY'S CASH CROP WEED

BY DONALD LEWIS

Ask anybody in Carroll County today about wormseed oil and a blank look is likely to be the reaction. However, there was a time when many, if not most, residents were well aware of this marvelous elixir.

Miracle Oil

A small geographical section of southern Carroll County and parts of Frederick County touted wormseed oil as a major cash crop for over 75 years. In the 1800s, farmers recognized that wormseed, botanically *Chenopodium ambrosioides L. var. anthelminticum*, was a weed whose seed oil could be used to treat roundworm, hookworm, and tapeworm in humans and animals. Native Americans long knew of this trait. *The United States Pharmacopoeia,* published in 1820, first officially listed wormseed as having a medicinal purpose.

American Wormseed (*Chenopodium ambrosioides anthelminticum*). Illustration by Adolphus Ypey, 1813. (Public Domain.)

The weed flourished in a strip from Westminster to Woodbine within about a five-mile width because of the stony, flinty soil found in the area. Winfield was once the center of the world's largest production area. Once the weed was harvested, farmers distilled the whole plant to recover the valuable oil product.

The wormseed plant is native to North America and the Caribbean. An article in the *Fort Worth Daily Gazette*, December 7, 1890, speaks of wormseed growing to the east of the city and how it was used as a medicine.

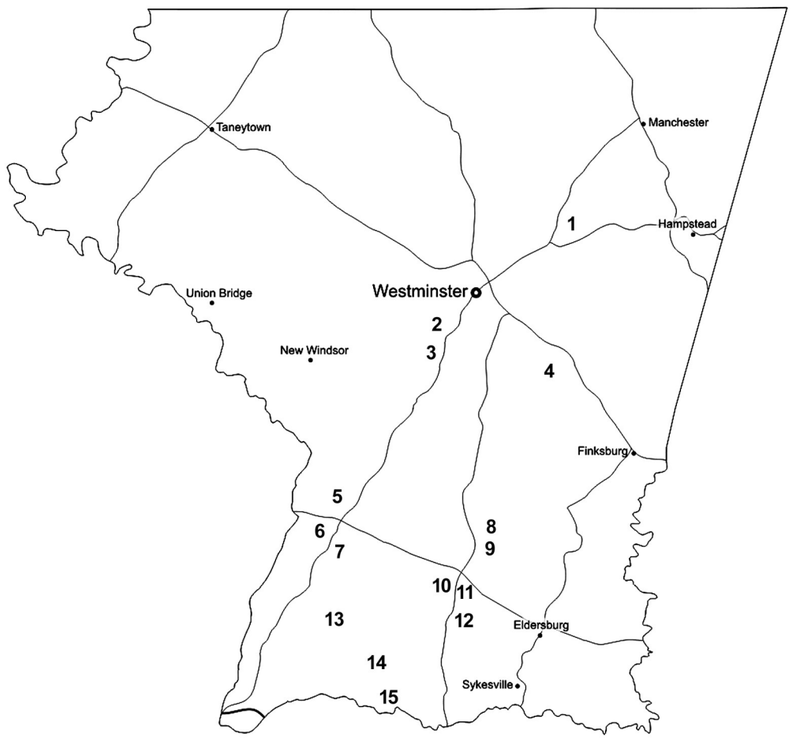
> In those earlier days every country store kept "wormseed oil" for sale, and don't the people of today, who were children then, well remember it with a shudder? A few drops of "wormseed oil" on a lump of sugar of a morning before breakfast. Then the next morning had to follow the castor oil! There were no capsules for walling in the nauceous taste of medicines in those days.

One of the problems with using wormseed oil as a remedy was not knowing how much to give to the patient, whether human or animal. The oil is very toxic and can cause damage to the liver and kidneys. The proven dose per body weight had not been developed in the 1800s, and as with any natural material, the composition of the oil differed year-to-year depending on growing conditions. The active ingredient, ascaridole, varied considerably and deteriorated with time.

In addition to its value as a medicine, the oil killed termites and was used in paint to preserve wood.

Known Carroll County wormseed growers

1. Harry Ogg - Old Manchester Road, near Gablehammer Road
2. Gist's - Westminster
3. Hering's - Westminster
4. Francis Bollinger - Bollinger Road
5. G.W. Magin - Taylorsville
6. Cliff Condon - Taylorsville
7. Gus Fleming - Fleming Road
8. Francis Hering - Gist
9. Ray Brown - Gist
10. Sam Smith - Buckhorn Road & Rt. 97
11. Harel Condon - Rt. 26, near Klees Mill
12. Frank A. Dorsey - Rt. 97, near Buckhorn Road
13. Arthur Haines - Gillis Road
14. John Pickett - John Pickett Road
15. John/Rob Lewis - Morgan



Germany employed the oil when building wooden boats because it killed any worms from the seawater that threatened to eat the treated wood. The oil was also used extensively on the hulls of the Clipper ships on the Chesapeake Bay. More recently, the scent industry utilized it in formulating perfumes.

Researching The Weed

Many studies have been conducted in Maryland on the growing, harvesting, and distilling of wormseed oil. G. W. Nelson did the first known research, dated February 16, 1863. "An Inaugural Dessertation on *Chenopodium Anthelminticum"* details growing and harvesting techniques of the time and covers several experimental distillations in a lab using soapstone distillation pots. The experiments also resulted in identifying the best methods for distillation to ensure a quality product, and the document is loaded with folksy information:

- In the 19th century, "aged women monopolized the whole trade and a few trials for its cultivation led to a successful result. The women thought it the only remedy to be safely relied on for the expulsion of worms from children, and consequently took great interest in it. They cultivated it in their gardens in a manner similar to the cultivation of cabbage at the present day."
- "Thus, germination takes place and the seeds transformed into minute plants which have all the beauty of nature's gift."
- "When the plant came to perfection (which is at that period when the fruit begins to darken) its collection was effected by cutting off that portion of the ends of the branches of the plants which bore the seeds or fruit and laying them in the shade to dry. Cultivated, collected and dried in this manner, it was mostly made use of in the form of an infusion and commonly known as worm tea."
- The growth and distillation of wormseed improved considerably and extended to the cultivation in fields by "men and boys" rather than by "aged women" in their gardens.
- The most difficult part that required "nicety in execution" was the peculiar effect cool weather

disgust, most likely) about the number of stills freely operating, even during daylight hours. They thought moonshine was the end product because the process for distilling alcohol was very similar to that of distilling wormseed.

However, what was certainly different was the smell. It is hard to find a description of the distilling process that does not use the word "stink" in some form. Indeed, other names for wormseed were "Stinking Goosefoot" and "Stinking Motherwort." Workers did not take their clothes indoors at all, and it is claimed that they were not able to wear them for at least six months after processing the crop.

The author vividly remembers riding by the Magin still north of Taylorsville and taking a deep breath on top of the hill and trying to hold it in until reaching the hilltop on the other side of the valley. That's because the odor hung in the low areas.

About 40,000 pounds of oil were produced in 1925 (*Democratic Advocate*, November 27, 1925). In 1940, 175 local farmers had 250 to 300 acres in wormseed production. Price fluctuated greatly, but generally the oil went for $3 to $7 per pound, though a high of $11.50 per pound was noted in 1940. In 1941, the *Farm Credit Messenger* reported the price ranged as high as $14 per pound. Adjusted for inflation, $14 per pound would be $235 per pound today. Generally, yield was 45 to 65 pounds of oil per acre.

By 1937, perhaps because of the Great Depression, only six stills continued to operate in Carroll County: Condon's at Taylorsville, Ray Brown's in Gist, Bollinger's on Bollinger Road, Gist's and Hering's in Westminster, and E.W. Pickett's on John Pickett Road at Woodbine. Magin's still on Ridge Road, built in 1940, stopped operation in 1966 and was torn down in August 1980. It could produce as much as 2,000 pounds per day with a 24-hour operation.

Sales & Distribution

Most of the oil was exported out of Baltimore to dealers and thus became known as "Baltimore Oil." Because the oil was corrosive, it was packaged in galvanized steel drums. New York's Polarome Company acted as buyer and broker for much of the wormseed oil produced in the late 1960s to 1970s. To cut out the middle man, some local farmers drove barrels of the oil to New York City.

The Magin family of Taylorsville was long a part of the wormseed industry. Francis (Buck) Magin remembered:

> My father George Magin and my brother, Donald and I, were in the wormseed oil business in the Taylorsville area. The family grew as much as 50 acres a year.
>
> Donald and I decided to truck a four-ton load of the oil (valued at $56,000) to the drug dealers in Manhattan one November. We started one night with the truck load of drums and arrived in New York before the opening of business, parked the truck and took a nap. An employee of the drug firm awakened us and opened a door to an elevator. We drove the truck in and we, truck and all, were taken to the eleventh floor. The drug company paid for the oil in 30 to 60 days. We asked about a hotel room and our friend called and told the manager that he had two country boys wanting a room and to give them a room high up as they were not used to street noises.

Edwin Magin, son of Francis, became an expert on wormseed and supported the wormseed exhibit at the Carroll County Farm Museum for many years.

During the 1960s, pharmaceutical companies started to synthesize the active ingredient in wormseed. They became a more reliable source because the process was cheaper, quantities could be made to suit demand rather than relying on growing conditions, and the oil had more consistent quality. This spelled the beginning of the end for the local industry.

Though synthetics have largely replaced wormseed oil grown in fields, a company in New York asked the late Edwin Magin of Westminster in 2015 about obtaining seeds so that it could use them to develop an all-natural, organic wormseed oil. Again, the extreme toxicity of this material would be of concern for any human or animal application. No further contacts were made by the company.

The Legacy

The last wormseed still known to exist in the world has been installed at the Carroll County Farm Museum. Rosie and Robert Day in Ijamsville, Frederick County, donated the equipment to the museum in 2015. It is a hybrid still because the Days

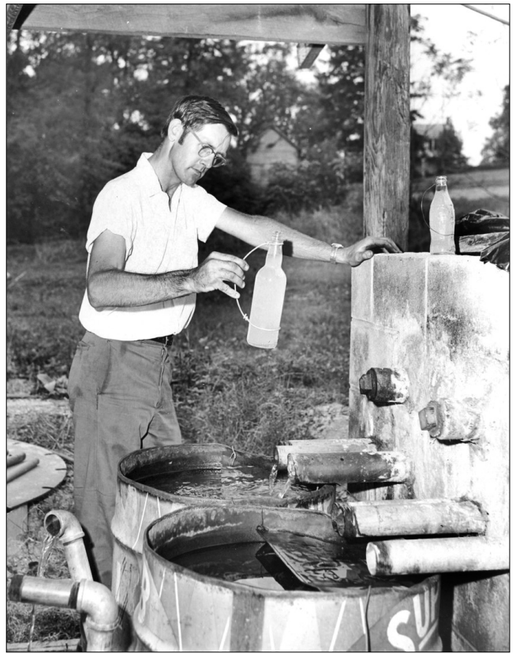
kettle with as much of the wormseed plants as possible and stomped them down. They sealed the kettle, and then steam from a boiler was charged to it for about 30 minutes. During this time, the steam vaporized the oil, and then the steam and oil mix was released through pipes into a condenser, referred to as the trough. Here the steam and oil liquefied. The oil, being lighter, floated to the top and was then separated and stored. In many cases, workers distilled the oil a second time to improve the purity.

To test the oil's purity, the only quality control technique available at the time was specific gravity. (Note: Specific gravity is a ratio of a liquid's density compared to water which is assigned a value of 1.0. An instrument known as a hydrometer is used to measure this.) Chemists initially targeted .965 in 1900 for wormseed, a number thought impossible for farmers to obtain. They were able to achieve only .940 as a maximum. It wasn't until 1919 that farmers discovered the plant had to mature in the field an additional 15 days to reach the target. The best they did then was .970. They also found, by doing a second distillation of the oil, a specific gravity of .995 was possible.

Over time, growers learned it was necessary for their distilleries to retain the water separated from the oil and also distill that because water discharges were killing all fish and other aquatic life downstream, even though there is only a slight solubility of the oil in water.

After distillation, growers returned the plant remains to the farm to be used as fertilizer or as animal feed. No animal would eat the plant before the oil was removed, but some found it palatable afterwards. The fertilizer aspect was particularly important since wormseed depleted soil nutrients quickly. Wormseed crops had to be rotated to new fields with regularity or the yield deteriorated significantly.

In 1927, 47 stills operated in Carroll County. Locals told stories of visiting ministers passing through the area and expressing great concern (and



Above: Robert Day checks condensed wormseed oil after distillation, 1977. (Courtesy of the Day Family.)

Below: Cows graze on wormseed residue after distillation, 1942. Photograph by A. Aubrey Bodine. (Copyright Jennifer B. Bodine. Courtesy of www.aaubreybodine.com.)

Planting seedlings. (Courtesy of Jeannie Mullinix.)

and contact with the oil had on distillers' hands, especially when coming in contact with cold equipment. This combination caused a very painful aching of the fingers and lingered four to five weeks after work was completed.

In 1933, Glenn Statley Weiland completed his Ph.D. requirements at the University of Maryland with his thesis, "A Study of the Factors Influencing the Yield." Weiland went on to co-author a key bulletin for the Maryland Agricultural Experiment Station in College Park in 1935, "Wormseed Oil Production."

The University of Maryland and the Agricultural Experiment Station continued to do research on wormseed, and the Maryland Extension Service regularly reported on it. In 1948, Albin O. Kuhn completed his Ph.D. thesis at the university: "Effect of Selection on Oil Producing Capacity of Wormseed." His detailed research focused mainly on the correlation between the density of glands on the under-surface of the plant's leaves and increased oil yield. Dr. Kuhn, who became the foremost expert on all things wormseed, wrote a number of papers on the topic, including *Fact Sheet 45*, published by the Maryland Extension Service, which provides an excellent summary of the history, farming practices, fertilization rates, and production of wormseed oil in Carroll County. Dr. Kuhn lived on a farm in Woodbine and in 1965, became the founding chancellor of the University of Maryland, Baltimore County.

Other state extension services issued papers about the quality of "Mid-West" versus Carroll County oil because the value of the local crop was so widely recognized. Though many studies tried to establish how to make the quality of other sourced oils equal to this region, eventually it was accepted that the climate and soil of Carroll County simply produced superior oil.

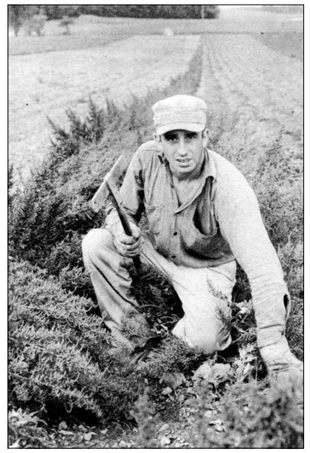
Cultivation

In July, wormseed produces a green flower that results in a small, round, green fruit. Within each are tiny, black seeds that are harvested in late September. (*The Baltimore Sun*, August 7, 2014) Farmers saved these seeds and used them to start plants in the early spring in cold frames or in new soil.

Local expert Larry Haines spoke of how some growers would clear trees from an area with a southern exposure to create a new planting space of 5,000 to 7,000 square feet. The rotted leaves from the trees and absence of competing weed seed provided a preferred planting environment. When the seedlings reached five inches, the growers prepared another field where they transplanted them in late May. Throughout the process, this was essentially a hand operation because mechanical devices harmed the seed and the plant. Typically, a horse or tractor pulled a planter similar to that used for pepper or tomato plants. Two people usually rode, one on each side, to hand-set the plants in the field.

During wormseed's growth, the farmers' greatest need was for cultivation to remove competing weeds. Much of this was done by hoeing because chemical weed killer would kill the wormseed plant too. Local farmer Don Haines described how much he abhorred this task:

> I hated hoeing. You had to hoe in a bent over position and be careful not to cut off a plant instead of a weed. You also had to be sure and get a good supply of soil back around the plant after you got rid of the weeds.



Gordon Haines uses a homemade cutter to harvest mature plants, November 1950. Photograph by A. Aubrey Bodine. (Copyright Jennifer B. Bodine. Courtesy of www.aaubreybodine.com.)

The growing and distillation of wormseed involved the full family. Though this was very labor intensive, interviews and articles provide witness to this being a much-loved family tradition.

One year in the Winfield area, James Dorsey gave each of his daughters, Judy and Marlene, one acre on which to grow wormseed. Judy enthusiastically offered, "We were each able to buy a cow that year with the money we made on the oil."

Inspecting plants before taking them to still, November 1950. Photograph by A. Aubrey Bodine. (Copyright Jennifer B. Bodine. Courtesy of www.aaubreybodine.com.)

Harvesting

Using homemade cutting tools, growers hand-cut the plants in September when they matured at two to four feet tall and left them to cure in the field for several days. Then in the morning while dew was still on the plants to help keep the seed intact, they hand-loaded them onto wagons and drove their cargo to the distillery for processing. Don Haines recalled,

"After we cut it, it had to lay for a few days to dry out. Then we got into what for me was the fun part of wormseed. Loading and going to the still. You loaded wormseed late at night or early in the morning. By early I mean like 3:00 a.m. You had to load when the wormseed was damp to keep the seeds on. Before loading, you had to make a row for the wagon or tractor. You did this by piling two or three rows on top of other rows. One person would get on the wagon; he was the loader. I never got to load; it took special skill. I was strictly a pitchfork guy. The pitchfork guy would get a bunch of wormseed on his fork and hand it up to the loader. You had to be careful; if you got that forkful too close to the loader's face you heard about it. There would be a lot of banter back and forth while you were loading, like, "Have any trouble getting up this morning?" And then the reply, "Oh, I had a terrible time." There was usually a lot of talk going on. It made things easier. And once you got that last pitchfork full onto that last load, you'd look back at the empty field and be glad you did it. You'd think back to March when it all began and say, "Nothin' left now but to get 'er to the still."

Loading mature plants for distillation at the Magin still in Taylorsville, November 1950. Photograph by A. Aubrey Bodine. (Copyright Jennifer B. Bodine. Courtesy of www.aaubreybodine.com.)

Robert Day's wormseed oil still in the 1970s before it was relocated to the Carroll County Farm Museum. (Courtesy of the Day Family.)

Another issue in handling the plant was toxicity. Larry Haines recalled the efforts to ensure the seed did not come into contact with the skin: They "used one-piece overalls and tied the legs around the boots at the bottom to make sure no seeds got down in the boots. However, some did and because of the wormseed oil getting on the skin, (it) caused the feet or the hands to burn."

Larry Haines took pride in buying the family's first tractor using wormseed profits. Until 1950, his family had used horses to pull the planter. When he was 12, Larry bought a Farmall A tractor for $500. "Neighbors would hire me to cultivate their wormseed. It only took one year to pay for that tractor. Wormseed is what paid the bills. I was able to buy a new tractor when I was 14 because of wormseed oil. I was able to buy a new car when I was 16 because of wormseed oil."

Like many local farmers, wormseed growers used German prisoners of war during World War II to harvest their crops. The P.O.W.s also loaded the plants onto wagons to be taken to the still.

Distillation

The best way to extract the oil was steam distillation, and numerous crude stills were built in the area. The process was fairly straightforward. Workers loaded a

Loading and stomping down wormseed plants in still kettles, 1963. Photograph by A. Aubrey Bodine. (Copyright Jennifer B. Bodine. Courtesy of www.aaubreybodine.com.)