DATE PALMS IN THE DESERT:

REIMAGINING AND COOPERATING WITH NATURE IN ARID ARIZONA

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A farm worker bends towards the rocky earth, his face shadowed by his broad-brimmed hat. His shovel is nearby, its tip stuck deeply into the ground, momentarily abandoned in the worker's distraction. The real focus of this scene is the newly turned earth and the sticks that rise from the desert soil like splayed fence posts. This photograph, taken at the Cooperative Date Garden in Tempe, Arizona, in 1900, is a picture of scientific experimentation and economic optimism. The seemingly dead sticks are offshoots of the date palm, *Phoenix dactylifera*, and hold the potential for a new agricultural industry that could revolutionize farming in the Arizona desert.[1]

This vision of desert wasteland transformed into productive agricultural land was seductive to many Southwestern Anglo farmers at the turn of the twentieth century; replacing cacti and mesquite with acres of oranges and deep-green alfalfa was an obvious and undeniable expression of social and economic progress. The composition of desert soils, lack of surface water, and extreme temperatures, however, presented distinct challenges to those who sought to plant traditional Eastern crops in the alien environment of the American West. To realize the vision of a verdant Arizona, government scientists turned their attentions to foreign crops that could survive in the state's harsh climate.

It is the natural history of the *Phoenix dactylifera* that made it a prime candidate for growing in the arid West. Domesticated in Iraq over five thousand years ago, the plant evolved to cope with, and even thrive in, conditions fatal to many conventional crops of the eastern United States.[2] Interest in date palm cultivation increased and, by 1890, the United States Department of Agriculture was working with Arizona

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[1] Walter Tennyson Swingle, *The Date Palm and its Utilization in the Southwestern States,* Bulletin of the Bureau of Plant Industry, United States Department of Agriculture, no. 53 (1904), 42.
[2] Donald Hodel and Dennis Johnson, *Imported and American Varieties of Dates (Phoenix dactylifera) in the United States* (Oakland: University of California Agriculture and Natural Resources, 2007), 6.

experimental stations to import and experiment with *dactylifera* offshoots from Algeria and Egypt.[3] Despite this rich history, Arizona date palms largely remain ignored by historians of food and agriculture. Scholars have instead focused on the rise of California's date industry with the result that little historical research has been published exclusively on Arizona date farming.[4]

The development of an Arizona date industry illustrates the working relationships established between government agencies, the University of Arizona, and farmers as they confronted and conformed to environmental limits. Their interactions were shaped by their understanding of the world around them; the programs, experiments, and plans created by these groups reveal the ways they interpreted the agricultural potential of the desert. At first glance, a date palm-laden West may seem as artificial as the iceberg lettuce-filled fields around Yuma, one of the hottest cities in Arizona. In some respects this initial observation is true; date palms are Old World plants that do not naturally occur in the Americas.[5] Any date palm living in American soil is related to the original seeds and offshoots imported from the desert regions of the Middle East and North Africa. Yet, despite their non-native origins, a close analysis of date cultivation in Arizona reveals that the palms are a convergence of two traditionally divergent practices: humanity's mastery over nature and place-conscious cooperation with nature.

Nineteenth century conceptions of land and wildlife as resources expressly available for human use colored American relationships with nature; working 'with' nature usually applied to situations where humanity's dominance proved impractical. Arizona's alkaline soils and insufficient surface water made a common method of dominance (intensive crop farming) impossible. Gradually, men like Robert H. Forbes, Director of the Arizona Territorial Experimental Stations and the USDA's Walter T. Swingle, realized that

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[3] Swingle, *The Date Palm and its Utilization*, 41.

[4] An important exception is the work of Charles C. Colley, a historian whose examination of the life of Arizona Agricultural Experiment Station Director R.H. Forbes introduced him to the history of date palm experiments undertaken in the Territory. Colley's subsequent research has proved to be some of the most valuable published sources on Arizona date palm history. Despite Colley's contributions, there is still much to be learned from the forays into date palm culture by the USDA and the Arizona experimental stations.

[5] James W Toumey, *The Date Palm*, Bulletin of the University of Arizona Agricultural Experiment Station. Tucson, no. 29 (1898), 103.

large-scale desert farming required a scientific approach that would make it possible to work within environmental limits. Forbes and Swingle identified the date palm as an economically feasible, and environmentally sensible, crop for the Arizona desert.

Thus the cultivation of the date palm from the 1890s to the 1920s is both a case of humans altering their environment and an example of the environment dictating the type and extent of the alterations. The convergence of these two paradigms resulted in a unique agricultural experiment that straddled the boundary between human adaptation and anthropogenic transformation of Arizona's landscape.

FROM SEEDS TO SUCKERS

In an article for the Date Grower's Institute, R.H. Hilgeman identified three distinct periods in Arizona date production and research. The decades between 1890 and the 1920 were years of initial investment in government-sponsored experimentation. The second period is the development of the date industry as a commercial enterprise between 1920 and 1950. The third era, between 1950 and the early 1960s, is marked by the decline in Arizona date production and the almost complete disappearance of the industry within the state.[6] It is largely the first period that best illustrates how date palms are indicative of the relationships between agriculture, science, and natural constraints.

The story of large-scale, government-sponsored date growing in the United States begins in 1887 with the passage of the Hatch Experiment Station Act. The Act formalized interest in uniting science with agriculture, education, and experimentation by establishing a national program of experimental stations.[7] Regents at the University of Arizona quickly realized that their new university could gain needed funds under the Hatch Act; in 1889, the University received $10,000.[8] The money hired Frank Gulley as dean of the College of Agriculture and director of the new Hatch-sponsored experiment station.[9] Without the

[6]Hilgeman, taken from Hodel and Johnson, *Imported,* 6.
[7] Alfred C. True, *A History of Agricultural Experimentation and Research in the United States 1607-1925,* Miscellaneous Publication of the U.S. Department of Agriculture, no. 251 (1937).
[8] The Territory established the University in 1885, Rice, "Arizona Agricultural," 124.
[9] Rice, "Arizona Agricultural," 124.

infusion of federal money explicitly meant for the establishment of research farms, few resources were available to build the research locations needed to explore the potential of an Arizona date fruit industry. The relationship between the federal government and the Experiment Station would remain an integral part of the experimentation process. Cooperation between the USDA and the Arizona Experiment Station was cemented in 1890 when the USDA purchased "superior Egyptian" offshoots to plant in New Mexico, California, and Arizona.[10]

The date palm's unique biology necessitated sending American scientists and plant physiologists to the Middle East in search of high-quality commercial date stock. Prior to 1890, the vast majority of date palms in the United States were grown solely from seed. Date palms, however, do not grow true to seed; each seed produces a plant that may not share the desirable qualities of its parents. A date seed from the popular *deglet noor* variety will not, in fact, be a *deglet noor* but instead may produce low-quality fruit or none at all. The only method of reliable date reproduction available to early industry pioneers was to "clone" a desirable variety by removing a sucker from the base of the parent palm and transplanting it to a new location. Donald Hodel from the University of California explains: "because they are clones, all individuals of a given date variety are genetically identical and have the same…characteristics."[11] Date palms are also diecious plants, meaning that individual palms bear *either* male or female flowers.[12] In a date orchard, the vast majority of the palms are females, for they produce the date fruit; only a few males are needed to pollinate the female flowers and otherwise have little economic value. Thus the USDA found it necessary to fund offshoot-gathering expeditions to the Old World to collect specimens from commercially viable, female palms that had already been specially bred and cultivated for centuries.

[10] Colley, "The Desert Shall Blossom," 280.
[11] Donald Hodel further explains the problem this way: "named date varieties or cultivars are actually clones that must be propagated vegetatively, most commonly as offshoots, young plants that arise from the base of the mother palm", Hodel and Johnson, *Imported,* 1.
[12] George W. James, *The Wonders of the Colorado Desert: Southern California, vol. 2 (*Boston: Little, Brown, and Company, 1906), 394.

Early importation was largely a failure, however, and many of the original Arizona offshoots perished when the Colorado River overflowed its banks at Yuma in 1891. The flood, according to one account, "retarded experimentation at that site for fourteen years."[13] Other sites suffered from cold temperatures, pests, and inexperienced cultivators. A larger blow came with the realization that the Americans had been "deceived" by their foreign contacts into importing worthless varieties rather than the esteemed named varieties they sought.[14] Despite these setbacks, both the USDA and Arizona scientists remained optimistic. In 1898, the Experiment Station and the USDA officially entered into a "cooperative agreement" in which the USDA would "import and ship to Arizona various types of date trees, which the station would plant and use for long-term research in date culture."[15] The following year brought another change in leadership to the Experiment Station, which had suffered from a series of short-lived and divergent directors.

Robert H. Forbes, previously the Station's chemist, assumed the role of director of the Arizona Experimental Station in 1899 and brought the Station into a new era of experimentation. His personal interest in date palm cultivation coupled with his leadership capabilities and his constant presence at the Station were powerful forces in launching long-term date experiments. Charles Colley, Forbes' biographer, paints Forbes as the father of the first serious forays into date research: "…date palm experimentation was not undertaken on an organized scientific basis until 1899 when, owing to Forbes' efforts, the University of Arizona acquired fifteen acres of farm land south of the little town of Tempe in the central part of the Territory for use as a date orchard in cooperation with the USDA… [the] Station would supply the land, irrigation, and care, and the government would import and deliver offshoots."[16] The cooperation between the Territory and federal government was not always easy. Colley recounts the often tense relationship between Forbes and USDA scientist W.T. Swingle who were both "strong willed and covetous of personal credit for their

[13] Colley, *Century*, 18.
[14] Swingle, *Date Palm Utilization,* 41.
[15] Rice, "Arizona Agricultural," 132.
[16] Colley, *Century*, 18.

contributions to the advancement of agriculture in Arizona."[17] Despite the occasional conflicts, Forbes provided effective management for his Station team and encouraged scientific solutions to the difficulties that threatened the industry before it even existed. Yet, even after overcoming inter-agency competition, Forbes still faced several biological challenges.

One of the most serious threats was posed by the *Parlatoria blanchardi* scale*,* a minute gray insect that is thought to have been accidently imported to the United States in the first batch of date offshoots.[18] The insect feeds upon the leaf tissues of the palm but "its greatest injury is in covering a cluster of dates and rendering them so unsightly that they are unsalable."[19] A common pest familiar to Old World date cultivators, the scale was quickly identified as a serious impediment by both government and Territorial scientists. Initial knowledge about parlatoria was extremely limited and early attempts to "vigorously" bathe the palms "with reeking solutions of kerosene and whale oil" in order to kill the scale failed completely.[20] Forbes, drawing upon his experience as the Stations' chemist, tried his hand at fumigation with little success. The parlatoria problem consumed Forbes, and the director of the Station was "increasingly obsessed with finding an answer to the problem which occupied his mind almost to the exclusion of personal or family life."[21] Forbes' scientifically-honed skills of observation finally revealed a solution after he noticed that palms can withstand short periods of intense heat and flame. Paul B. Popenoe, a man who travelled to the Old World in search of desirable date stock for importation, recorded Forbes' eventual triumph: "treatment of the scale by burning was introduced by the University of Arizona Experiment Station…all the leaves of an infected specimen are cut closely back, and the trunk is then gone over with a gasoline blow-torch."[22]

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[17] Colley, *Century*, 27.
[18]Paul B. Popenoe, *Date Growing in the Old World and the New* (Los Angeles, Calif.: George Rice and Sons, 1913), 149.
[19] Popenoe, *Date Growing*, 149-150.
[20] Colley, *Century*, 19.
[21] Colley, *Century*, 20.
[22] Popenoe, *Date Growing*, 150.

Though the scorching method would fall out in favor of other biological and chemical controls, Forbes' strategy illustrated his desire to create a viable American date industry.[23]

After the initial failures, subsequent palm importations were more successful. By 1901, the Arizona Experiment Station had more than 400 planted offshoots.[24] Forbes proudly claimed "our experiment is attracting, not only the attention of the agriculturalists in Arizona and Southern California, but that of horticulturalists the whole country over."[25] Indeed the size and scope of the experiments were staggering: 1,076 lots of date offshoots imported between 1890 and 1929, resulting in a total of about 20,000 individual palms comprised of 149 date varieties.[26] The successful result of the cooperation between the USDA and the Arizona Experiment Station ensured that date palms would remain a superimposed feature upon the region's desert landscape for decades to come.

MASTERY OVER NATURE

In May of 1900, Director Forbes sent a letter to Mr. H.M. Chapman, Secretary of the Board of Trade in Phoenix, Arizona, to accompany his gift of boxed *deglet-noor* dates, courtesy of the Experiment Station:

> These dates are samples from one of the choice varieties of trees which the Arizona Agricultural Experiment Station, with the help of the Department of Agricultural, is importing to Arizona...The excellent quality of these sample dates, far superior to anything that can be obtained upon the common markets in this part of the country, shows the possibilities of date culture in Arizona…[I]t is well worth while for the agriculturalists of this region to look ahead and prepare for the establishment of at least small orchards of these varieties. I hope that you will call the attention of the Phoenix public by proper means to these samples.[27]

The optimistic declaration that it would be worthwhile "for the agriculturalists of this region to look ahead" to a profitable future for desert farms is one that resonated with the attitude of the era. Science and

[23] Forbes himself recognized his scorching cure as one of his most important achievements. In 1967, in honor of his one hundredth birthday, a state newspaper ran a list of seven events that Forbes considered to be his crowning achievements; third on the list was "his discovery of the flame method of eradicating the parlatoria date palm scale in 1905 making possible the expansion of a great new agricultural industry in the Southwest." Colley, *Century*, 122.
[24] Rice, "Arizona Agricultural," 132.
[25] R.H. Forbes to W. Sproule, October 22, 1901, University of Arizona Agricultural Experiment Station Records(1890-1915), box 11, folder 2, University of Arizona Library Special Collections, Tucson.
[26] Hodel and Johnson, *Imported,* 3.
[27] R.H. Forbes to H. M. Chapman, May 11, 1900, University of Arizona Agricultural Experiment Station Records(1890-1915), box 11, folder 1, University of Arizona Library Special Collections, Tucson.

technology promised mastery over a landscape that had previously resisted Anglo efforts to subdue it. Professional experimental agriculturalists were among the crystal-gazers who foresaw Arizona, especially the Salt River Valley around Phoenix, as a resource that was "wasted" in disuse. Focus on the Salt River Valley intensified as it became obvious, to both the Experiment Station and the USDA, that the Tucson Station was not ideal for date cultivation. Instead, the lower elevation, hotter average temperatures, and the promise of easy irrigation made the agricultural potential of the Salt River Valley glow with promise. By 1904, a Bureau of Plant Industry bulletin recognized the Valley's importance to the fledgling date industry by stating that "the date palms planted by the earlier settlers have been strikingly successful; in fact, it is no exaggeration to say that there are more bearing date palms producing fruit of good quality in the Salt River Valley than in all the rest of the United States."[28] Twenty-five years after Forbes' optimistic letter, the Phoenix Arizona Club released a pamphlet entitled *Little Stories of Success in the Salt River Valley* that described the Valley as having

> broad, level lands, green the year 'round, surrounded by purple mountains and abundantly irrigated by the inexhaustible waters of the Salt River distributed through the ten-million-dollar Roosevelt Dam. In extent the Salt River Valley is approximately 300,000 acres and is the most fertile area in America. Here is the wonderland of the West for crops are always certain and harvests abundant. Prices may vary according to markets but failure of crops is impossible.[29]

One of the supposedly indestructible crops that the Club chose to highlight was the date palm. The pamphlet included a personal statement from Ira Beck, a Valley "Date Rancher," espousing the high profits ("$2,200 to $3,000 per acre" in 1924) enjoyed from a small date plantation. The "inexhaustible waters of the Salt River" fed the dreams of small-time farmers who saw the Valley as a more affordable California.

The vision of a desert oasis laid out in a checkerboard of fruit trees and irrigation ditches was not possible without a complete reorganization of the environment. In order to plant a date fruit orchard, the land needed to be cleared, leveled, and homogenized. The monocropped, plantation-style that resulted was both

[28] Swingle, *The Date Palm and its Utilization*, 127.
[29] Phoenix Arizona Club, *Little Stories of Success in the Salt River Valley—Phoenix, Arizona,* (Phoenix: Republican Print Shop, 1925), University of Arizona Library Special Collections, Tucson.

an ecological and a visual departure from the original look of the Arizona desert. The low-slung plains of the region's characteristic basin-and-range geology, horizontally stretching to the next mountain range, was transformed into a vertical forest of palms that towered over the native mesquite and palo verde. In picturing the desert as a place of prosperity, the very characteristics that denoted 'desert' were either destroyed or reimagined in a positive light. In 1900, William E. Smythe published a book entitled *The Conquest of Arid America* that reflected common sentiments towards America's dry lands. One particular chapter, "The Blessing of Aridity," proclaimed that "Nature frequently conceals her raw materials of greatness… until time and opportunity are ripe…The land which the casual traveler, speaking out in the splendid depths of his ignorance and prejudice, condemns as 'worthless' and fit only 'to hold the earth together,' is in reality rich and durable beyond the most favored districts in the humid [Eastern] regions."[30] The belief that 'Nature' had hidden away its riches under the guise of a "worthless" desert supported the reorganization of the land as a worthy effort to access the profitable resources. It also hinted that the conquering of arid America could only be the result of a powerful and intelligent society, with farmers working in cooperation with scientists in order to realize their destiny of irrigated agricultural fields that "would never impoverish, but actually enrich, the fortunate soil."[31]

In July of 1903, Director Forbes received a letter that confirmed the perception of the date palm as a profitable and progressive new crop that would, through its propagation, make use of the hidden resources of the West. An agent of the Louisiana Purchase Exposition, commonly known as the Saint Louis World's Fair, requested the participation of the Experiment Station in the international event scheduled to open in April of 1904.[32] The Exposition highlighted the economic and social progress of the United States during the one hundred years since the formalization of the 1804 Louisiana Purchase treaty. The "conquering" of the arid West was a fundamental representation of the country's development. Date palms were symbolic of the

[30] William E. Smythe, *The Conquest of Arid America*, (New York: Harper & Brothers Publishers, 1900), 30, 34.
[31] Smythe, *Arid America*, 40.
[32] J.L. Farmer to R.H. Forbes, July 24, 1903, University of Arizona Agricultural Experiment Station Records (1890-1915), box 11, folder 5, University of Arizona Library Special Collections, Tucson.

reorganization of nature that was necessary in order to realize America's idealized destiny as a prosperous, technological-agrarian state. Yet despite the over-selling of Arizona's water, the idealized descriptions of places like the Salt River Valley, and the romantic image of wasteland turned to productive fields, the date palm experiments were rooted in a fundamental understanding of environmental limitations. In the attempt to turn desert into date-ranch, scientists at the USDA and the Arizona Agricultural Experiment Stations collected data and knowledge of the environment in order to make informed predictions about the success of date cultivation in the western United States.

PLACE-CONSCIOUS COOPERATION

In the era of Gifford Pinchot-inspired campaigns for the efficient use of forest lands, many Southwesterners interpreted their low deserts and arid plains as suffering from mismanagement and underutilization. When R.H. Forbes travelled through Arizona, he saw a region decimated by overgrazing and bad farming practices.[33] Forbes recognized that one way to halt, and maybe even to reverse, this environmental damage was to work within the natural parameters of a given region. Date palms, already evolutionarily equipped to handle many of Arizona's limiting factors, were an appealing compromise between human ambition and natural constraints. Though they were non-natives that required irrigation, dates could turn a tidy profit in a region with few agricultural options.[34]

As the director of the scientific agricultural station and a keen observer of the environment, Forbes had a complex relationship with the natural world. Forbes believed in the power of science to shape a landscape but also witnessed the destruction caused by mismanagement and economically-driven exploitation. In 1899, Forbes articulated his search for natural balance as a struggle between the need to "know this primitive nature" and the negative possibilities of ignoring natural limits.[35] Thus Forbes carefully directed his Station towards crops that originated in climates similar to Arizona's.

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[33] Colley, *Century*, 12.
[34] Swingle, *Date Palm Utilization,* 51.
[35] R.H. Forbes quoted in Colley, *Century*, 11.

The similarities between the environments of North Africa, the Middle East, and Arizona convinced R.H. Forbes "that arid Arizona could improve its situation by learning about and borrowing from other desert regions of the earth."[36] Forbes' predecessor at the Station, J.W. Toumey, was similarly intrigued. In Toumey's treatise *The Date Palm*, he compared the average rainfall, temperature, and other climatic factors between "three Stations in Southern Arizona [Tucson, Phoenix, and Yuma] and six Stations in the Date Regions of Northern Africa."[37] Toumey declared that there was "great similarity between the climatic conditions of Southern Arizona and the regions adjacent to the Sahara Desert." He followed that statement with a prophecy: "date culture will in time become an important industry over considerable areas of the interior arid region of the Southwest, of which Southern Arizona may be considered the center."[38] Other scientists emphasized the palm's tolerance for alkaline soils, a feature of both African and Arizona deserts. W. J. Swingle identified this tolerance as an important characteristic, stating:

> the immense superiority of the date palm over all ordinary crop plants for culture in alkaline lands becomes evident when it is remembered that all ordinary useful plants, such as wheat, corn, and alfalfa…etc, are killed by as much as 0.5 or 0.6 per cent of alkali in the soil, which amount is entirely without influence on the date palm.[39]

With these climatic studies serving as a foundation, perhaps it is not surprising that scientists at the USDA and the Arizona Agricultural Experiment Station also considered Southern Arizona an "analogous environment" to historic date producing areas and thus an appropriate location for experimenting with North African and Middle Eastern crops.[40]

DECLINE

The promising climatic similarities between Old World deserts and Arizona failed to make up for one crucial difference between the two regions: seasonal precipitation. Southern Arizona has a distinct precipitation pattern divided between the soft rains of the winter, generally between November and March,

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[36] Colley, *Century*, 17.
[37] Toumey, *Date Palm*, 126.
[38] Toumey, *Date Palm*, 130.
[39] Swingle, *Date Palm Utilization,* 121.
[40] Gary Paul Nabhan, *Where Our Food Comes From*: *Retracing Nikolay Vavilov's Quest to End Famine*, (Washington, D.C.: Shearwater Books, 2009), 88.

and the torrential storms of the summer monsoons, typically July through September. The precipitation pattern for Northern Africa is almost exactly the opposite, with the driest period occurring during Southern Arizona's monsoon season.[41] Toumey conceded, after analyzing his climatic tables, that there were "marked differences as to the seasons of greatest drouth and greatest precipitation" between North Africa and Arizona but believed the difference unimportant.[42] Later experience would prove that the timing of the seasonal rains was crucial; if the date fruit was to mature and dry, it needed a period of little moisture that directly corresponded to Arizona's monsoon. The summer rains "resulted in repeated losses…and these quickly discouraged growers."[43]

To compensate for environmental limitations imposed upon Arizona date ranchers, the USDA and the Experimental Stations experimented with artificial ripening techniques. The concept of artificial ripening was not a new one; various methods were practiced for centuries in the Arab world, yet the use of chemicals was a uniquely American development. [44] The University of Arizona Experimental Station found that carbon dioxide was an effective means of ripening date fruit.[45] The Southern Arizona desert was once again reinterpreted but this time, ironically, as a place of too much moisture. Paul Popenoe, one of the early champions of the American date industry, stated in a 1913 essay that "in Arizona the grower must decide for himself what [artificial ripening method] he will use; if he is in such an unfavorable situation as Tempe, where the ground is continually saturated, the air frequently moist, and summer rains to be expected, perhaps carbon dioxide will be necessary."[46]

By 1920, there was sufficient knowledge on date palm propagation that government emphasis shifted from experimentation to encouraging commercial investment and private development. Arizona's 'date-

[41] Toumey, *Date Palm*, 127.
[42] Toumey, *Date Palm*, 127.
[43] Hodel and Johnson, *Imported,* 1.
[44] Popenoe, *Date Growing*, 135.
[45] R.H. Forbes quoted in Popenoe, *Date Growing*, 137-138.
[46] Popenoe, *Date Growing*, 139.

boom' was relatively short-lived, for almost all of the state's fruit-bearing date palms were planted by 1932.[47] Though no detailed data exists to relate precise numbers for this period, the projected peak of Arizona date production occurred during World War II, with roughly 1.5 to 2 million pounds of fruit sold annually.[48] Yet even at its peak, Arizona's date production was outpaced by California.[49] The superior date-growing climate of California proved to be the final blow to any hopes that Arizona would dominate the industry. Built upon propagation innovations developed in Arizona, California date production overtook Arizona by 1915.[50]

In the post World War II era, Arizona's date industry entered a quick decline that was the result of a myriad of environmental and social factors. Several years of low temperatures and heavy summer rain caused crop losses at the same time that the cost of artificial ripening, packing, and labor increased. Additionally, competition from California and foreign growers, and the availability of other natural and artificial sugars, compounded the problem.[51] Finally, the land itself was reimagined as the Sunbelt era arrived. As Phoenix, Tempe, and other Salt River Valley towns mushroomed into a contiguous mega-city, date orchards fell to the bulldozer. By 1960, urban sprawl destroyed many of Arizona's commercial date ranches.[52] As of 2007, Arizona had a total of 1,354 acres planted to dates compared to 6,315 in California.[53] Today, commercial production in Arizona remains limited, and date harvesting continues in the Salt River Valley largely due to home gardening groups, such as the Arizona Date Gardens, which harvests around 100,000 pounds annually.[54] Of special interest to Arizonans is the Black Sphinx variety, a cultivar unique to

[47] Hodel and Johnson, *Imported,* 6.
[48] Hilgeman, taken from Hodel and Johnson, *Imported,* 6.
[49] Hodel and Johnson state that even at its peak "Arizona trailed behind California and produced less than one-tenth of California's date harvest during Arizona's peak years," Hodel and Johnson, *Imported,* 6.
[50] Hodel and Johnson, *Imported,* 6.
[51] Hodel and Johnson, *Imported,* 6.
[52] Hodel and Johnson, *Imported,* 1.
[53] United States Department of Agriculture, "State Data," *2007 Census of Agriculture* (2009): 546, http://www.agcensus.usda.gov/Publications/2007/Full_Report/Volume_1,_Chapter_2_US_State_Level/st99_2_032_032.pdf.
[54] Hodel and Johnson, *Imported,* 6.

the Phoenix area.[55] The fruit of the Black Sphinx, threatened by development and the old age of the remaining palms, is an Arizona delicacy whose "fragile, brown-black skins and rich, sweet, flavorful flesh" has garnered interest from gourmet chefs and once again drawn national attention to Arizona dates.[56]

The history of date palms in Arizona follows the boom-and-bust trajectory typical of industries in the American West. By uniting scientific experimentation with agriculture, the early years of the Arizona date industry are a striking example of the historical trend during the late 1800s and early 1900s towards the development of agricultural science as a discipline. It is true that date palms may be considered simply another method to extract wealth from the desert environment, but it is also true that the idea of importing crops already adapted to desert conditions illustrates that R.H. Forbes, W.T. Swingle, and other scientists at the USDA, understood the power of environmental limiting factors. This lesson of living within natural constraints is one that has been learned and forgotten many times throughout Arizona's history. As we continue to farm the desert Southwest, we would do well to remember that our agricultural systems reside on a fine line between dominating and being defined by environmental conditions.

[55] Hodel and Johnson, *Imported,* 6; Gary Paul Nabhan, *Renewing America's Food Traditions: Saving and Savoring the Continent's Most Endangered Foods* (White River Junction, Vt.: Chelsea Green Publishing Company, 2008), 86-87.
[56] Nabhan, *Renewing America's Food*, 86.

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