NEW GROWTH IN ANCESTRAL LANDS:
Agricultural Development in Palestine, 1880-1948

WILLIAM GRAY DOSSETT

A Thesis
in
International Relations

Presented to the Faculties of the University of Pennsylvania in
Partial Fulfillment of the Requirements for the Degree of
Bachelor of Arts
2016

Samuel Helfont, PhD, Supervisor of Thesis

Abstract

Perhaps Israel's most well known national myth claims that, after finding Palestine a desolate wasteland, early Jewish settlers "made the desert bloom." This narrative holds that native Arabs were not good stewards of the land, and therefore the Israelis have a greater right to it. Surprisingly considering its political importance, this myth has hardly been analyzed at all. Therefore this thesis uses a mixed-methods approach to answer two questions: *Did Zionist settlers in Palestine really "make the desert bloom"*? and *What were the primary factors behind agricultural and ecological changes in Palestine in the years 1880-1948*?

My first section uses an original data set to test two hypotheses, measuring the growth rate of Palestinian agricultural output by year and crop then comparing those results to the increase in the Jewish population to determine how the two trajectories correlate. My second section analyzes documents from official British archival sources and primary sources representing both Arab and Jewish viewpoints. It tests six hypotheses to determine the factors behind the patterns of agricultural productivity shown in Section 1.

The results indicate that the "making the desert bloom" myth is incomplete at best. Jewish immigration correlates strongly with the production growth of only one crop: the orange, where Zionist capital and expertise was vital to its success post-World War I. Increases in several other crops' production coincide with booms in the Jewish population, but document analysis shows this to be more likely the result of government programs and reforms. While the orange crop was important, it alone does not support a "making the desert bloom" scenario, particularly since they were grown in the fertile coastal plain. Rather than being due to the ingenuity and resources of Jewish settlers, the general increase in the agricultural productivity of Palestine was more likely the result of improved governance under the British Mandate.

Table of Contents

List of Figures

Acknowledgments

To my family, who have shown me the world;

To Dr. Sam Helfont, who helped me shape and mold a rough impression into a thesis;

To Dr. Isa Camyar, Dr. Frank Plantan and the I.R. Department for their guidance;

To Professor Robert Vitalis, whose class first opened me to the Middle East;

To my friends, for their help and support;

Thank you so much.

And to the peoples of the Holy Land, may you find peace.

“The wilderness and the dry land shall be glad; and the desert shall rejoice, and blossom as the rose.”

- Isaiah 35:1

"What are the Palestinians? When I came here there were only 250,000 non-Jews, mainly Arabs and Bedouins. It was a desert – more than underdeveloped. Nothing. It was only after we made the desert bloom and populated it that they became interested in taking it from us."

- Israeli Prime Minister Levi Eshkol, 1969

Chapter 1: Introduction

In Israel, everything has a history and a meaning. Sacred to three great religions, the land is not merely a stage for historic deeds but an actor, a cause and a goal in itself. Since the genesis of the Zionist movement, Jewish immigrants to Palestine have been renowned for their devotion to the land and its rehabilitation. The first slogans of the Zionist movement, such as "A land without a people for a people without a land," point to the Jews' need for a national home but also that the land itself, a waste and a desert, would benefit from the return of the exiles. The earliest settlers came to Israel not to open shops and businesses but to settle and work the land, which blossomed under their care. In addition, their capital and knowhow aided the neighboring Arabs in improving their own lot. Since independence, the small country has produced numerous important innovations in dry land agriculture. The Jewish State's impressive agricultural achievements are among its greatest sources of international acclaim.

Yet the narrative just described, in which Israel "makes the desert bloom" is just that: a narrative. Like all narratives, it tells a story from a particular point of view and, like everything in Israel, is unmistakably political. Sometimes implied, sometimes clearly explained, the message is the same: the Arabs were unwilling and unable to care for this land, while the Jews have built a paradise out of a desert. The land of Israel is and should be theirs, if not by divine right then by simple common sense. Palestinians naturally see this narrative as not only false but offensive, yet it remains strong in the public imagination both inside and outside Israel.

The goal of this thesis is to critically examine the "making the desert bloom" myth, determining the effects that Jewish immigration had on agriculture in Palestine and the factors that can explain the process. In particular, I try to understand how Jewish practices affected the agricultural sector as a whole, including how Arabs changed their techniques due to the newcomers' arrival. I hope that my explicitly apolitical approach will help resolve the bitterly partisan debate over the "making the desert bloom" myth.

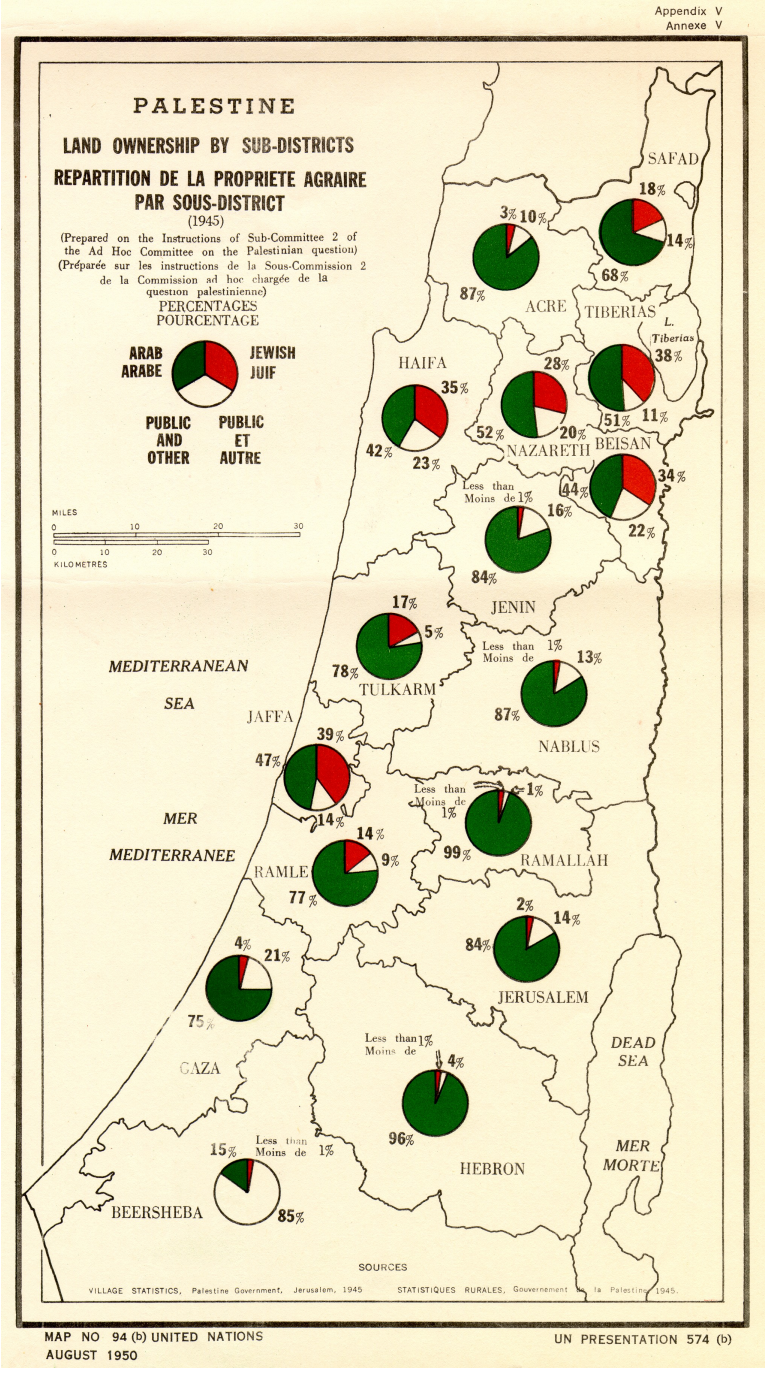
There has been surprisingly little scholarly analysis on this question considering its importance to Israelis and the salience of the Israel-Palestine conflict in international politics. In fact there has been only one significant examination of the myth, done by Alan George in 1979, whose analysis exclusively concerns the land area of Jewish and Arab agriculture.[1] His conclusions regarding the period after Israeli independence will be discussed in Chapter 2, the literature review. He also, exemplifies a relatively well-known and completely uncontroversial fact about the Palestinian agricultural sector before independence, which is that at no point did Jews own more land than Arabs, even on the eve of Israel's independence (see Figure 1.1) This fact is vital in understanding my approach.

Since Jewish land accounted for only a small percentage of total arable land in Palestine, the 'blooming' of the desert could only have happened through indirect means. A key portion of the "making the desert bloom" myth is in fact that Jewish settlers indirectly increased the production of their Arab neighbors, providing them with the instruction, capital and technology required to modernize their own primitive

[1] George, Alan. ""Making the Desert Bloom" A Myth Examined." *Journal of Palestine Studies* 8.2 (1979): 88-100. Web.

agriculture.[2] George ignores this, but any attempt to truly evaluate the myth must account for and explain these processes.

Figure 1.1[3]



[2] Cuinet, Vital. *Syrie, Liban Et Palestine, Géographie Administrative, Statistique, Descriptive Et Raisonnée*. Paris: E. Leroux, 1896. *Google Books*. 593.
[3] "Palestine: Land Ownership by Districts." *Village Statistics, 1945*. United Nations, 1945. N. pag. *Wikimedia*. Web.

Another flaw in George's paper is that he severely underutilizes British reports. They are the only primary sources from the period that, while certainly not free of bias, are not written to support either the Jewish or Arab side against the other. Created mostly to inform better policymaking in London, the writers in fact had a strong incentive to be objective and accurate in their assessments. By applying these sources to this question, this thesis will help fill a yawning gap in our understanding of the national myths of the State of Israel and the early history of the Zionist movement. This approach is entirely new and will better inform scholars and policymakers as to the roots and nature of the Israel-Palestine conflict. In order to accomplish these goals, I pose two research questions.

My first research question is, *did Zionist settlers in Palestine really "make the desert bloom"*? I rely on quantitative techniques to map out the progression of Palestinian agriculture in terms of overall production.[4] The economic and agricultural statistics used are derived primarily from British consul reports, as they are the most reliable records available for that time. This process enables me to determine when and how the output of Palestinian farms changed, and how this correlates with Jewish immigration, broken down by year and by major crop. Despite the deceptive simplicity of the question, the answer is nuanced and complicated.

My second research question is, w*hat were the primary factors behind agricultural and ecological changes in Palestine in the years 1880-1948*? In order to answer this question, I have analyzed a large number of British reports on agriculture in Palestine as well as many pro-Zionist and pro-Arab primary sources. The resulting

[4] In this thesis I use the term "Palestine" and "Palestinian" to describe a geographic location and things associated with it. This was overwhelmingly the most common term used at the time being studied, and implies no political judgment.

document analysis traces the trajectory of Palestinian agricultural development through the lens of a number of economic factors. I determine both whether the presence or absence of a given factor materially effected development and how Jewish immigration impacts the availability of the resource in question. I chose the years 1880 and 1948 to limit my research because this is the period where Jewish and Arab agricultural coexisted in close proximity as settlers flocked to Palestine but before the *Nakba*. Once again, there are few easy answers in a topic as complex and contentious as the history of Palestine, and my conclusions reflect this.

The rest of this thesis is laid out as follows. Chapter 2 summarizes and examines the "making the desert bloom" myth and its presence in the literature on Israeli and Palestinian history. Chapter 3 presents my research methods. Chapter 4 contains my quantitative analysis and its results. Chapter 5 contains my qualitative document analysis and its findings. Chapter 6 contains a summary and discussion of the results and their implications for the Israeli-Palestinian conflict.

Chapter 2: Literature Review

This literature review explores one of the central myths in Israeli history: that the Zionists made the desert bloom. This myth holds that Arab Palestinians and their Ottoman Turkish overlords neglected and mistreated the land, which was dominated by deserts, swamps and denuded landscapes. Early Zionists then lovingly worked the land and cared for it, planting trees, increasing agricultural productivity and restoring fertility. This myth is extremely common in modern histories of Israel/Palestine, and is often mentioned only briefly in large works, or referred to casually without being examined in the first place at all. Gervasi's 1969 *The Case for Israel* is an excellent example of this,[5] but they abound in literature (both scholarly and popular) and other media.

The purpose of this literature review, and indeed of this thesis as a whole, is to examine the "making the desert bloom" myth and assess it truthfulness and what policy implications follow. Currently few authors have analyzed this myth in depth, and they use it to condemn or justify the past rather than look to the future. This lack of literature is especially surprising considering the extensive re-examination of some of Israel's other founding myths, such as the work of the so-called "New Historians" who, in the 1980s and 90s, researched newly opened Israeli archives to challenge many of the country's traditional narratives. Unfortunately, they fail to address the "making the desert bloom" myth in any depth, although their criticism of Israeli mythmaking generally might make them pre-disposed to question it. Nevertheless there are many

[5] Gervasi, Frank. *The Case for Israel*. New York: Viking, 1967. Print. 22-23.

sources that describe a reality that does not fit closely with it. I call this body of literature "non-Zionist," not to make a political statement but because they do not conform (in whole or in part) to the "Zionist" narrative. These categories are not intended to assume an author's political leanings, but only describe the content of their writing.

In the light of these categories, where one is defined as simply the absence of the other, one might expect this literature review to begin with the Zionist narrative, but I will instead start with the non-Zionist one. This is because these authors include more of the history of Palestine in their studies, some going back to the 1830s, rather than beginning with the first *Aliyah* (wave of immigration to Israel) in the late 19th century. I hope that, by beginning with a non-Zionist perspective, I will provide a more complete picture of both the history and historiography of Palestinian agriculture.

The Non-Zionist Narrative

Although opposition to the Zionist myth defines tise non-Zionist group of authors, they do not categorically reject it. Rather they problematize it in many important ways, presenting a more nuanced view of the myth. Freed from a focus on Zionists only, they draw upon centuries of history to tell a long and complex story.

Under Ottoman Rule

In a well-researched paper on Palestinian agriculture before World War I, Buheiry (1981) shows that the region was the main regional producer of a variety of

crops and related industrial products such as soap and olive oil for centuries.[6] At no point was the country a desert, as the Zionist tagline claims. Yet under Ottoman rule, the country did gradually decline into a relatively unproductive backwater. The Turks were unable to maintain security against marauding bands of Bedouin nomads and so the population of Palestine lived mostly in the more defensible hills and highlands. According to Swedenburg (1993), the lowlands were cultivated by seasonal workers and owned communally.[7] There is some debate over whether and how much collective ownership and periodic redistribution of land (known as *masha'a*) reduced the peasants' willingness to invest in fertilizing the land,[8] but considering the evidence and the economic incentives involved it very likely did. When the Egyptian ruler Muhammad Ali briefly occupied Palestine in the 1830's, however, he imposed order and an efficient bureaucracy in the region for the first time in centuries. Local peasant farmers (known as a *fellah*, plural: *fellahin*) increased the extent of land under cultivation and trade with the rest of the world grew significantly.[9] Upon their reconquest the Ottomans largely kept Egyptian reforms intact, and agriculture in Palestine slowly began to prosper.

The growth of Palestinian agriculture in the second half of the 19th century is a central difference between Zionist and non-Zionist understandings of the history of Palestine. Non-Zionists tend to focus on the dramatic changes that Palestine witnessed

---

[6] Buheiry, Marwan R. "The Agricultural Exports of Southern Palestine, 1885-1914." *Journal of Palestine Studies* 10.4 (1981): 61-81. Web.
[7] Ted Swedenburg. "The Role of the Palestinian Peasantry in the Great Revolt (1936-1939)." *The Modern Middle East: A Reader*. Ed. Albert Hourani, Philip S. Khoury, and Mary C. Wilson. Berkeley: U of California, 1993. Print. 469.
[8] Temper, Leah. "Creating Facts on the Ground: Agriculture in Israel and Palestine." *Historia Agraria* 48 (2009): 78-79. Print.
[9] Prittie, Terence. *Israel; Miracle in the Desert*. New York: Praeger, 1967. Print. 6.

before Jewish migrants entered the country in any significant number and put less stress on their success upon arrival. Kimmerling and Migdal (1993) argue that Muhammad Ali's reforms were the beginning of a complete transformation of farming techniques, crops grown, location of fields, markets that the farmers sold to, legal ownership of land, etc.[10] The impact of these changes would be seen later in the century.

The rewriting of the Ottoman Land Code in 1858 was another inflection point in the process of agricultural development. Kimmerling and Swedenburg both specifically mention that law as transformative, and Shafir (1989) identifies the period following its implementation as a critical one for agriculture in Palestine, which lead the way to a general economic rebirth.[11] The new law mandated that land be registered, whereas before whoever cultivated land could claim ownership. For a variety of reasons, mostly involving a desire to avoid the Ottoman state's taxation and military conscription, many Palestinian fellahin either did not register their lands or did so collectively under a single name.[12] As a result, much of the land in the coastal lowlands and valleys of Palestine became the legal property not of the peasants who had farmed it for generations but of absentee landlords who were *ayan* (notables) in cities such as Constantinople, Jaffa, Damascus and Beirut.

The Land Law of 1858 led to a dramatic increase in productivity and agricultural exports. The owners of the new estates could leverage their connections and personal wealth to generate significant investment in agriculture and grow crops for

---

[10] Kimmerling, Baruch, and Joel S. Migdal. *Palestinians: The Making of a People*. New York: Free, 1993. Print. 11.
[11] Kimmerling and Migdal, 15. Swedenburg, 471. Shafir, Gershon. *Land, Labor, and the Origins of the Israeli-Palestinian Conflict, 1882-1914*. Cambridge: Cambridge UP, 1989. Print. 28.
[12] Owen, Roger. *The Middle East in the World Economy, 1800-1914*. London: Methuen, 1981. 175.

exports (which soared) rather than subsistence. They soon were dramatically out-producing the smallholding fellahin still farming the hills.[13] Wheat, barley, maize and other staples spread to the lowlands, but Palestine also saw the return or dramatic rise of cash crops such as sesame, olives, cotton, grapes and oranges.[14] By the 1870's, total production had grown thanks to the increase in the amount of land under cultivation, but farming methods remained some of the same that had been practiced since Biblical times. Arab agriculture was not integrated with animal husbandry, mostly rain-fed rather than irrigated and very labor intensive. The average yield was 650kg per hectare or 60kg per dunum,[15] which was half that of Germany and France at the time but comparable to Argentina.[16] Therefore Palestine was a poor but rising region, whose inhabitants were beginning to take advantage of recent Ottoman reforms and to enter the world economy in a meaningful way. In the view of the non-Zionist, the Zionist contention that the Arabs were poor custodians of the land is belied by the profound changes in Palestinian agriculture before large-scale Jewish immigration began.

The First Aliyah began in the 1880s. A small number of Russian Jews built several agricultural settlements in Palestine, and they initially faced the same obstacles that the local Arabs did, particularly malaria.[17] Nevertheless, these Jews had a profound impact on the ecology and agriculture of Palestine. Non-Zionists agree wholeheartedly with Zionists that "redeeming" the land was a key feature of Zionists' ideology, and immigrants were encouraged to work the land themselves in order to lay claim to it and form an attachment to it. This they did with unquestioned enthusiasm. The new arrivals

[13] Kimmerling and Migdal, 16.
[14] Kimmerling and Migdal, 13.
[15] The amount of land a fellah could farm in a day, approximately a quarter of an acre
[16] Shafir, 28-29.
[17] Kimmerling and Migdal, 21.

drained swamps, dug wells and built irrigation systems. Planting trees and nurturing pine forests in the denuded landscape was a point of particular emphasis.[18] When heavy European iron plows proved ineffective in the Palestinian soil, they created and/or imported a new, lighter one (known simply as the "Jewish plow"), which was also adopted by the Arabs.[19] They brought in a more sophisticated thresher and increased the use of horses and donkeys as draft animals before transitioning to mechanical power. Larger Arab landholders adopted these measures where possible, but most of the smallholding fellahin did not have access to the necessary capital to follow suit.[20]

This version of events is nearly a consensus in non-Zionist literature. But Shafir gives most of the credit for agricultural innovation to a small, obscure group of German settlers known as the Templars. He claims that among their innovations were new forms of crop rotation, soil fertilization and "mixed method" farming that combined dairy production with growing fodder, as well as the introduction of machinery and new crops such as potatoes.[21] Shafir is clear that these innovations benefited the Jewish population far more than the Arab one yet the ayan class, with their access to capital, likely did at least partially adopt them. For example, they were responsible for the investment necessary for the Arab orange and olive groves where production grew twice as fast as acreage and (again according to Shafir) spearheaded the introduction of the internal combustion engine there.[22] The only other authors to discuss the Templars as reformers are Kimmerling and Migdal, who only say that they brought the scythe to

---

[18] Kelly, T. "'A Land of Rock, Marshes and Sand'? Forests, Orchards and Legal Inequality in Israel/Palestine." *Social & Legal Studies* 22.4 (2013). *SAGE*. Web. 19 Oct. 2015. 577.
[19] Aaronsohn, Ran. "The Beginnings of Modern Jewish Agriculture in Palestine: "Indigenous" vs "Imported"." *Agricultural History* 69.3 (1995): 443-444. Print.
[20] Kimmerling and Migdal, 22-23.
[21] Shafir, 29.
[22] Shafir, 29.

the region. [23] It is likely impossible to know exactly who first brought what to the Holy Land, but the true consensus in the literature is that reform came from without, from Europe.

Reasons for Zionist Success

This impressive progress begs a question that is central to this thesis: *how* were the Zionists (and Templars) able to modernize the agricultural industry so rapidly, whereas the native Arab population did not? The answer to this question might indicate how Israel's current neighbors can replicate its success as an agricultural nation.

The non-Zionists do not believe that this modernization happened merely by the virtue of the immigrants' dedication and hard work. Rather they point to the immense advantages that the Zionists had over their Arab neighbors in terms of access to capital and the latest agricultural techniques and machines being pioneered in Europe. In the earliest years of the movement (1885-1900), this access boiled down to one man: the Frenchman Baron Edmund de Rothschild. Numerous sources portray him as the rescuer, leader and chief benefactor of the beleaguered colonists of the first aliyah.

Before Rothschild's arrival, the Zionist settlers were floundering. Born in urban middle-class families in Eastern Europe, they had no background in agriculture, and many of their settlements were on the brink of collapse by 1885.[24] Up until that point, they had tried (and failed) to copy the subsistence-style agriculture of their neighbors and would often, despite ideological objections, hire Arab experts to help them.[25] Small Jewish farmers, those with less access to land and capital, would continue to copy

---

[23] Kimmerling and Migdal, 22.
[24] Laqueur, Walter. *A History of Zionism*. New York: Holt, Rinehart and Winston, 1972. Print. 78.
[25] Aaronsohn, 22-23.

Palestinian methods for years.[26] Aaronsohn (1995) describes the complex origins of the agricultural reforms introduced by the Zionists in the late 19th and early 20th century as a process of blending imported European techniques with the tried-and-true methods of the locals. The 'Jewish plow' is one such blend, and none of the other non-Zionist authors contradict this interpretation.

The Baron de Rothschild's finances and connections were therefore invaluable to Zionism's ability to "make the desert bloom," rather than simply fall into the rhythm of the country around them. The true breaks from the past - e.g. the draining of swamps, fertilization, digging wells, irrigation, etc. - were entirely based on his support.[27] Rothschild created or supported the early agricultural schools that trained the next generation of Jewish agronomists and botanists, including the celebrated Aaron Aaronsohn. He brought French agronomists with experience in Algeria to Palestine, building a plantation system that grew wine grapes, oranges and other cash crops.[28] This system was isolated from traditional Palestinian agriculture and relied heavily on imported European machinery and expertise, particularly in viniculture.[29] Using these gifts, Zionist settlers improved marginal lands that the Arabs were not farming and produced bountiful harvests from them.[30] The innovations brought to Palestine by the Baron de Rothschild formed the foundation of the future growth of Jewish agriculture under the British Mandate.

---

[26] Shafir, 53.
[27] Aaronsohn, 444.
[28] Shafir, 50-51.
[29] Aaronsohn, 446.
[30] Swedenburg, 476.

The British Mandate

The period of the Mandate continued the general trends that had been established in the last decades of Ottoman rule, where ayan agriculture grew, the fellahin fell further behind and Jews purchased more land. The essence of the narrative and myth that authors are creating or questioning derives from earlier or later time periods, under the Ottomans or after Israeli independence in 1948.

Kimmerling and Migdal note that after World War I, agriculture was a central contributor to the strong economic growth Palestine initially saw under the British Mandate.[31] For many small landholders, the new economy was a catastrophe. Many fellahin fell into debt and moved to growing cities.[32] Those that did not continued to lack access to the capital and education required to compete, and Jewish yields of crops such as wheat and barley doubled Arab ones.[33] Temper argues that, despite their byzantine methods and crushing inefficiency, peasants were making the most of a bad situation, doing what they could under the masha'a system.[34] She also quotes extensively from Nadan (2006) who argued that these fellahin methods, while seen as primitive by Europeans, Zionists, and many other scholars, were in fact rational considering the abundance of labor and the shortage of capital.[35]

The literature is split on who is most to blame for the economic pressures that squeezed the mountain fellahin. The ayan class was the first to bring cash crops to Palestine on a large scale, but the Zionists were responsible for kicking that system into

---

[31] Kimmerling and Migdal, 27.
[32] Kimmerling and Migdal, 27-28.
[33] Aaronsohn, 82.
[34] Temper, 83.
[35] Nadan, Amos. *The Palestinian Peasant Economy under the Mandate: A Story of Colonial Bungling*. Cambridge, MA: Distributed for the Center for Middle Eastern Studies of Harvard U by Harvard UP, 2006. Cited in Temper, 2009, p.84.

high gear. Aaronsohn claims that Arab were intensifying their methods during the Mandate but Zionist land buying interrupted their progress, and that competition from highly industrialized Jewish farms caused some productive sectors of the Arab economy to de-develop.[36] On the other side, Swedenburg and Khalidi both claim that Zionist contributions were exaggerated by their penchant for buying the most fertile land available and leaving much of it fallow as a reserve for future settlers.[37] Regardless of who is to blame, the geographically small but economically efficient Jewish agricultural system gained ground on the Arabs until the War of 1948.

The State of Israel

Independent of the origins of agriculture in Israel, the young state lays claim to significant accomplishments in this area since its founding. Non-Zionist authors do not deny that Israelis have advanced agricultural technology, particularly by making it more water-efficient. Temper in particular lauds the extension of irrigation by nearly 500%, covering nearly half of Israeli agricultural land, and the invention of drip irrigation. According to some authors, however, these accomplishments are overstated. Temper prefaces her positive assessment of Israeli innovation by showing that the actual number of hectares under cultivation has not increased significantly since independence, and that the production of many water-intensive crops has declined significantly (fig. 1).[38] Kelly (2013) observes that some of the most visible and enduring examples of how Zionists "made the desert bloom," Israel's young pine

[36] Aaronsohn, 85-86.
[37] Khalidi, Walid. *Palestine Reborn*. London: I.B. Tauris, 1992. Print. 32. Swedenburg, 475.
[38] Temper, 93.

forests, are seen by many as political acts designed to claim the land and ensure the permanent displacement of native Palestinian agriculture.[39]

Figure 2.1

Cropping Patterns in Israel, 1943-2001 (hectares)

	1943	%	1960	%	1980	%	2000-2001	%
Orchards	83,100	19,1	72,200	19,8	88,600	21,8	84,840	25,7
Citrus	26,700	6,1	32,800	9,0	39,600	9,7	25,330	7,7
Field Crops	278,000	63,8	245,200	67,3	259,300	63,8	184,960	56,0
Wheat	133,400	30,6	59,300	16,3	97,600	24,0	64,150	19,4
Barley	118,200	27,1	59,600	16,4	26,700	6,6	2,030	0,6
Rough Fodder	—		67,100	18,4	39,700	9,8	64,050	19,4
Cotton	0		10,500	2,9	62,200	15,3	14,620	4,4
Vegetable*	30,600	7,0	26,300	7,2	35,500	8,7	55,110	16,7
Miscellaneous	44,000	10,1	15,900	4,4				
Irrigated Area	36,200	8,3	130,500	35,8	203,000	50,0	186,600	56,5
Rainfed area	399,500	91,7	234,000	64,2	203,400	50,0	143,660	43,5
Total Cropped Area	**435,700**		**364,500**		**406,400**		**330,260**	

* Includes potatoes and melons. Source: Own elaboration from Survey of Israel (1985), and *Statistical Abstract of Israel* (2002).

George (1979) mounts a critique of the myth that focuses extensively on the period post-independence. His argument is convoluted in parts, but compelling enough to be cited by Temper, writing 30 years later. He examines official Israeli statistics of agricultural expansion and finds them exaggerated by several hundred thousand dunams due to double counting of land that is sown twice a year.[40] More damningly, however, he compares the amount of land under cultivation in 1948 (when most Palestinians fled Israel) to official estimates of arable land under the Mandate. He concludes that, rather than blooms where there once was desert, Israelis have been reclaiming fertile farmland abandoned by fleeing Arabs, and in 1974 had yet to equal

[39] Kelly, 579-580.
[40] George, 97-98.

the amount of land under cultivation before the war.[41] George's argument is elegant and persuasive, but he has not clearly demonstrated that his math takes into account the different size of Palestine under the Mandate, and Israel in 1948 and 1974. Nevertheless he deals a significant blow to the claim that Israel has made the desert bloom by expanding arable land, as discussed in Chapter 1.

The Zionist Narrative

The Zionist narrative is far more straightforward than the non-Zionist one, as is typical of myths (regardless of their accuracy). As already discussed, the "made the desert bloom" myth claims that the Arabs and Turks were poor stewards of the land of Palestine, deforested it and allowed much of it to revert to desert or swamp. In contrast, the early Zionists relied on their hard work, perseverance and love for the land to nurture and recreate the Biblical Holy Land flowing with milk and honey.

The Narrative Explained

Naturally this narrative begins with the ecological condition of Palestine in the late 19th century. Katz (1985) is typical when he says that it was "unloved by its rulers and uncared for by most of its handful of inhabitants."[42] The use of the term "handful" is not accidental. A tiny Palestinian population is a common feature of the Zionist myth. Eliav (1974) employ similar language, describing the country as "thinly populated," with large tracts of "desert, swamp and quicksand."[43] For perspective, these two authors come from opposite sides of the Zionist spectrum. Prittie (1967) claims that

---

[41] George, 98.
[42] Katz, Shmuel. *Battleground: Fact and Fantasy in Palestine*. 3rd ed. Toronto: Bantam, 1985. Print. 117.
[43] Eliav, Arie Lova. *Land of the Hart: Israelis, Arabs, the Territories, and a Vision of the Future*. Trans. Judith Yalon. Philadelphia: Jewish Publ. Soc. of America, 1974. Print. 23.

the Arabs lacked education and an understanding of agriculture, having deforested the country over the centuries.[44] He cites a travel account from the Mandate period of a drive from Jerusalem to Nablus, through the core of the hill country, where the land is treeless, rocky and poor. The traveler also remarked that the rulers did not care if the land was destroyed, echoing Katz.[45] The language that Zionist authors use is often stark and vivid, emphasizing the dispiriting, deathly quality of the environment and the poverty and apathy of its inhabitants.

This is contrasted with the strong attachment that early Jewish settlers felt to the land and their efforts to improve it. Eliav explains how manual labor was both a symbol for and an integral part of the Zionist dream to retake their ancestral land, even to the point of willingly farming poor, marginal lands that the Arabs did not want.[46] Gilbert (1998) describes this process as the Jews "redeeming" the land, a word that he is not alone in using.[47] The word choice reflects a messianic calling to bring the Holy Land back into the hands of the faithful and, with loving care, to redeem it in the eyes of God and the global Jewish community.

When discussing the success of the early Jewish farmers, Zionist authors dwell on the obstacles overcome rather than the gains made. The draining of malarial swamps is of particular importance to these authors and is referenced by Gilbert, Eliav and Katz.[48] For them, however, there are also many other impressive achievements to be proud of. Gilbert, for example, describes the proliferation of Jewish enterprises, particularly the agricultural training schools that shaped new generations of Zionist

---

[44] Prittie, Terence. *Israel; Miracle in the Desert*. New York: Praeger, 1967. Print. 11.
[45] Prittie, 19.
[46] Eliav, 21-22.
[47] Gilbert, Martin. *Israel: A History*. New York: Morrow, 1998. Print. 8.
[48] Gilbert, 6 &9. Eliav, 23, 25 & 26. Katz, 118.

leaders.[49] Katz takes the boast further, claiming that the Arabs were merely "passive beneficiaries of these developments," who were given access to improved farming techniques that raised the standard of living.[50]

Reasons for Zionist Success

Zionist authors emphasize the Jews' courage, innovation, and hard work as being critical to their success rather than the access to financing that non-Zionists propound. Certainly they do not ignore the contributions of Baron de Rothschild and the thousands of diaspora Jews who donated to the Jewish National Fund, but the emphasis is elsewhere. Eliav, for example, clearly states that without Rothschild, the first aliyah would have failed, but this comes after several pages extolling the settlers' determination, bravery, even "instinct."[51] Gilbert is perhaps closest to the non-Zionists. He meticulously details Rothschild's contributions and how external funding from the diaspora sustained Jewish settlements and land purchases, but the qualities of the settlers themselves are discussed just as often. He quotes Theodor Herzl as testifying to the Royal Commission on Alien Immigration in 1902 that Zionism could succeed only in Palestine, "because when you want a great settlement, you must have a flag and an idea. You cannot make those things only with money."[52] With due consideration to the importance of external capital, this point is unassailable. The Zionist undertaking was enormously difficult and dangerous, and without an exceptionally dedicated group of settlers it could never have succeeded.

---

[49] Gilbert, 25.
[50] Katz, 119.
[51] Eliav, 24 & 26.
[52] Gilbert, 21.

This perspective was not exclusive to the Zionists themselves, nor is it a narrative created since the founding of the state of Israel. Oren (2007) describes how two American irrigation and soil experts, Elwood Mead and Walter Clay Lowdermilk, came to Palestine in the early years of the British Mandate and agreed that there had been centuries of mismanagement but that Jewish efforts were restoring the land's former fertility.[53] Both became major advocates for Zionism in the United States. Kimmerling and Migdal also note that Zionists at the time of the Mandate argued that their movement had helped end feudalism among the fellahin and improved peasant farming with new irrigation and growing techniques as well new seed varieties, similar to Katz's point.[54]

The State of Israel

When examining the history of agriculture post-independence, Zionist authors often follow the exact lines of argumentation that Temper, Kelly and George do, notably innovation and extension of the cultivated area. Skolnick (2001) shows how Israel met an early goal of becoming self-sufficient in all foods except meat and grains within a decade of independence by expanding the cultivated area by over 250% to more than a million acres.[55] He also praises Israel's innovation in irrigation and intensive farming practices.[56] Prittie advances similar numbers, agreeing with the million acre mark, adding that 380 000 of that was irrigated by 1968 and valued at over $480million. This is up from 400 000 total acres in 1948, of which 75000 were

---

[53] Oren, Michael B. *Power, Faith, and Fantasy: America in the Middle East, 1776 to the Present*. New York: W.W. Norton, 2007. Print. 439-440.
[54] Kimmerling and Migdal, 32.
[55] Skolnik, Fred. "The State of Israel (1948-2000)." *A History of Israel and the Holy Land*. Ed. Michael Avi-Yonah. 4th ed. New York: Continuum, 2001. Print. 334.
[56] Skolnik, 335.

irrigated, valued at $60million.[57] These numbers speak for themselves, and are very impressive if true, but none of the authors provide a refutation for George's claims against their validity or deny the imbalance in land area farmed under the Mandate.

Conclusion

The narratives advanced by the Zionist and non-Zionist camps are different in many ways, and but only a few of those go beyond mere questions of style, emphasis or choice of information. The two stories are not irreconcilable, as their agreement on most factual points indicates. The Zionist myth tells the story of a group of people who were extraordinarily brave and determined in the face of overwhelming odds, while the non-Zionist narrative is a history of a region and its people in a time of great change and turmoil. The challenge for this thesis, therefore, is to find where each narrative most closely aligns with verifiable facts and figures. From this, I will be able to enumerate the resources and characteristics of the Zionist movement that were most critical to its success.

[57] Prittie, 33.

Chapter 3: Research Methods

This thesis addresses three main research questions. First, *did Zionist settlers in Palestine really "make the desert bloom"*? Second, w*hat were the primary factors behind agricultural and ecological changes in Palestine in the years 1880-1948*? Each question corresponds with a research section. The first will be primarily quantitative, analyzing changes in agricultural production overall in the late Ottoman and British Mandate periods. The second will be qualitative, using primary sources to determine what were the most important changes being made and what made them possible.

Section 1 – Hypotheses and Variables

The first section tests the extent to which the "greening the desert" myth is true. In order to do so, it is critical to accurately define the terms used. Yet it is impossible to understand what Zionist writers have meant by "desert" or "bloom," and therefore I cannot objectively determine whether their determination that Palestine was a "desert" that then "bloomed" is accurate. As explained in Chapter 1, an approach based on cultivated land area alone (the literal 'greening' of the landscape) does not adequately test the myth. If the Zionist narrative is correct and Jewish immigration did in fact make the land prosper, the effects must have been felt in overall agricultural productivity, beginning in the Ottoman period with the First Aliyah. Therefore my first hypothesis is:

H1a: *The growth rate of agricultural productivity accelerated significantly after 1880.*

Observing an increase in productivity, however, does not tell us where the increase occurred nor who is responsible for it. The religion of the farmer will be difficult to determine using quantitative methods, and qualitative document analysis

research can only provide examples rather than a broad picture. I therefore look for a relationship between overall levels of Jewish immigration into Palestine and the increase in agricultural productivity. If Jews did in fact make a significant difference in the production of Palestine, the two should correlate closely. My second hypothesis is phrased in this way:

H1b: *Production increases were correlated with the number of Jewish residents in Palestine.*

This hypothesis will give me a clear image of whether Jewish immigration coincided with agricultural production increases in Palestine as a whole. Measuring total production, rather than only Jewish production, is critical to correctly estimating the effect that Jewish immigrants had on their Arab neighbors. I use total Jewish population rather than only the agricultural or rural population because the data is more accurate for the former. Since the mechanisms by which the settlers supposedly influenced and aided Arab agriculture are vague, a measurement that encompasses the total strength of the Yishuv in Palestine can better account for all variables studied. While this quantitative approach cannot determine causality definitively, proving or disproving these hypotheses will nevertheless allow me to understand the context in which the greatest changes were happening.

Section 1 – Methods

My data set for H1a will begin in the early 1870s, several years before the first Jewish settlements were founded, in order to create a baseline of productivity growth, and will continue until 1948. Because Ottoman production statistics either do not exist or have been lost, I will measure agricultural exports as a proxy for total production instead. This method will suffice since, as shown in the literature review, cash crops

became a significant part of the Palestinian agricultural mix beginning in the mid 19th century, and therefore account for a significant portion of total production by value. The relative surplus or shortfall of fellahin and other food-producing farms should be reflected in the amount of food imported or exported as well. Any outliers will be especially visible in the data set since it is broken down by variety of crop.

My data is also limited to exports from Jaffa, Palestine's only major port during the Ottoman and early Mandate periods and the seat of the British consul or consular officer depending on the year. Consul reports that provide numbers for exports from other ports, such as Haifa or Gaza, are rare to nonexistent up until the last years of the 19th century. Several reports mention that Jaffa handled the vast majority of the country's trade, however, so this does not affect the credibility of my findings. I will measure both the quantity of production/export and the value of the trade. This will account for the shift from relatively low-value cereals to more high-value cash crops that occurred in Palestine in the late 19th century.

In order to resolve H1b I will look to population records from the Ottoman and Mandate periods as well as accepted scholarly estimates for the years where exact Jewish population numbers are unavailable. The Ottoman records, unfortunately, are unreliable. They counted only citizens and legal residents of the empire, thereby ignoring the significant number of Jews who had immigrated illegally or under temporary visas. The only year when data is available on foreign inhabitants is 1893. Using that data, Justin McCarthy has estimated a population of 4000 non-citizen Jews in what is now Israel at the time. He later determines that by 1914 that number had climbed to approximately 18000 which, added to official Ottoman census statistics,

roughly corresponds to post-war census on the number of Jews in Palestine.[58] McCarthy's work provides the basis for my population data.

For this thesis it is critical to take into account population growth that does not appear in Ottoman census data while avoiding artificially large jumps in the data value for years in which reasonable estimates of non-citizen Jewish residents exist. I spread the increase out evenly over the years in which it occurred, in a manner similar to McCarthy when estimating population for individual years during the Mandate. He estimates the beginning of large-scale Jewish immigration at 1882.[59] I spread the number of immigrants from 1882-1893 out over 12 years, adding 333 to the official tally for 1882, 666 for 1883 and so on. From 1894-1914 an additional 14000 Jews had immigrated and stayed without becoming Ottoman citizens or legal residents, so for those twenty years 700 will be added to the official statistics for 1894, 1400 in 1895 and so on.

Estimates of the Jewish population changes during World War I are not available. The British Mandate for Palestine began in 1920, and the first comprehensive survey was done in 1922. McCarthy reverse-projects the population to 1918 and provides yearly population numbers until 1946, assuming constant increase. This is imperfect, since some years saw more Jewish immigration than others, but such year-to-year variation in immigration is unlikely to impact the trend of agricultural productivity growth since establishing newly arrived immigrants on farms or kibbutzim would take time, as would the process of making these new farms productive. Therefore McCarthy's estimates are specific enough for my purposes. With the data set

---

[58] McCarthy, Justin. *The Population of Palestine: Population History and Statistics of the Late Ottoman Period and the Mandate*. New York: Columbia UP, 1990. 18-19.
[59] McCarthy, 23.

built, comparing the rate of Jewish immigration to the rate of production growth is fairly straightforward. The complete data set is available in Appendix B.

Section 2 – Hypotheses and Variables

The second section is designed to determine the main factors behind the growth of agriculture in Palestine between 1880 and 1948. In order to do this, I will hypothesize a number of explanations and then test them all individually. This will allow me to understand the causes in both a yes-or-no frame (as in, a factor either had an effect or it did not) and a more nuanced evaluation of how Jewish immigration to Palestine affected the availability of that factor. I intentionally focus on man-made causes rather than climactic or geographic ones, as I am seeking to understand the Zionist model of agricultural policy rather than the fine details of Middle Eastern agriculture.

One of the central features of the non-Zionist narrative of agricultural productivity in Palestine was the prominence of money donated to Jewish settlements from outside. It also emphasized the importance of the investment that the ayan brought to Arab agriculture in the aftermath of the Land Law of 1858. Therefore my first hypothesis will be:

H2a: *Jewish immigration led to an increase in the availability of capital and funding for agriculture in Palestine, which was critical to productivity growth.*

The most obvious use of this capital would be in Jewish farms and to buy land from Arabs. H1a is worded to encapsulate those phenomena as well as any general effect that Jewish immigrants may have had on farmers' financial circumstances.

Funding is the clearest and most obvious form of support that an organization can send to another, but it is not the only one. The literature also describes the

importance of technological innovation, whether brought from Europe, invented in Palestine or some combination of the two. To measure this, my second hypothesis will be:

H2b: *Jewish immigration led to an increase in the availability of modern agricultural technology in Palestine, which was critical to productivity growth.*

A final point that is mentioned in the literature is how the Rothschild organization imported skilled agriculture experts from places such as Algeria to advise Zionist settlers. To evaluate the importance of this occurrence, my third hypothesis will be:

H2c: *Jewish immigration promoted agriculture on an educated, expertly advised basis in Palestine, which was critical to productivity growth.*

There is one prominent hypothesis that I will not test that is central to the Zionist narrative, namely, that Zionist immigrants loved the land more than the Arabs or were innately more hardworking and resourceful. I categorically reject this explanation. Most importantly, it is impossible to rigorously test in a historical sense. In addition, as phrased by some Zionist authors it skirts the edge of anti-Arab prejudice, and therefore contributes nothing towards the goal of this thesis.

One way that this aspect of the Zionist narrative can be analyzed without resorting to stereotyping, however, would be by examining the political goals of the movement. It is well established in the literature that Zionism generally and Labor Zionism in particular was very focused on the land of Israel and "redeeming" it through hard work, and that this political goal was central to every effort at Jewish agricultural settlement in Palestine. Therefore my fourth hypothesis can be stated as:

H2d: *The Zionist ideology of Jewish immigrants was critical to productivity growth in Palestine overall.*

Functionally this hypothesis delineates all farms into two rough categories, one Jewish and the other Arab. While most Jewish immigrants to Palestine were committed Zionists, there is no evidence of an ideological Arab response that intentionally used farming as a tool to reclaim the land. This hypothesis will therefore measure most inherent or practical differences between the two groups. It also offers a path to explore the importance of ideology in the development of the rural Yishuv.

Another important aspect of the changes wrought in Palestine was the changing kinds of farming. As the literature review demonstrated, both plantation-style and collective farming became more commonplace in the late 19th and early 20th centuries, replacing the smallholder fellahin farms or the rotating masha'a system. My fifth and sixth hypotheses examine the influence of these changes:

H2e: *The rise of communal farming institutions was critical to productivity growth in Palestine overall.*

H2f: *The rise of plantation-style farms was critical to productivity growth in Palestine overall.*

These six hypotheses examine many different aspects of farming in the late 19th and early 20th centuries. Proving one to be true or false does not affect the others. The goal of this section is to not to determine a clear cause and effect relationship, because the changes that occurred in Palestine between 1870 and 1948 were too dramatic and multifaceted for such an approach. Rather I seek to understand broadly what made farms in this period different than their predecessors and how did Jewish immigration help or hinder that change.

Section 2 – Methods

Rather than the purely quantitative methods of Section 1, Section 2 will rely on document analysis. As mentioned briefly in Chapter 1, this research section relies primarily on a neglected portion of the historical record, British reports. In addition to containing many useful and important production and trade statistics, the consul staff and Mandate-era bureaucrats recorded their observations of the agricultural sector, particularly the Jewish settlements. These reports present an unbroken history of agricultural development in Palestine from before the First Aliyah up until Israeli independence, without significant political bias or large gaps, other than World War I.

The first documents that I examine are British consul reports. These were produced by officers of the British Foreign Service stationed at Jaffa and report primarily on the commerce in port. Luckily, the first German Templar and Jewish settlements were founded in the vicinity of the city and so fall under the prerogative of the consul staff there. They extensively discuss the settlements' growth, as well as their effects on the local area. Up until 1886 report these were published under the moniker *Reports from Her Majesty's Consuls on the Manufactures, Commerce, &c. of Their Consular Districts*, which I abbreviate to "*Reports from Her Majesty's Consuls*," (year) when citing them in footnotes. Between 1887 and 1914 these same reports on trade at Jaffa were published as part of the Foreign Service Annual Series under *Diplomatic and Consular Reports on Trade and Finance: Turkey*, abbreviated in this thesis to *"Report for the Year (year)."*

After World War I and Britain's acceptance of the Mandate for Palestine, the government produced yearly reports sent to the League of Nations that contained detailed descriptions and statistics chronicling the administration of the territory.

Agricultural development was a major priority for the British and figures prominently in these reports. The first one published covers the years 1920 and 1921, as a civilian administration replaced the military one. This one and the subsequent four were named simply *Report on Palestine Administration*, while the rest up until the last edition produced in 1941 were named *Report by His Britannic Majesty's Government to the Council of the League of Nations on the Administration of Palestine and Trans-Jordan*. When citing a report from either category I use the shorter *Report on Palestine Administration* and the year.

There are several more detailed reports that were commissioned by His Majesty's Government at various times and for various reasons, often to do with Arab disturbances and their causes. Some of these are well known, such as the Hope Simpson Report and the Peel Commission Report. These are cited by primary author's last name when possible, and by title of the report otherwise.

In addition to British reports, I examine numerous other primary sources from a variety of sources. They include writings by Zionists in Palestine, supporters and detractors from other countries and memoranda produced by political actors on both sides. These sources serve to balance the perspective provided by the British reports. While there were not clear biases in these reports, and outside sources often confirmed their contents, a diversity of perspectives lends my conclusions more certainty and weight.

I am aware of the potential pitfalls of relying too heavily on official archival accounts of colonial history. In this particular instance, however, the dangers are less severe than they might be in other circumstances. In most colonial archives the power

dynamic flows one way – the colonizer oppresses and silences the colonized. In Palestine, however, it was much more complicated. First, up until 1914 the Turks served the role of colonizer rather than the British who criticized Ottoman rule, weakening their control of the official narrative rather than generating a self-serving one of their own. Second, under the terms of the Mandate the British were held responsible by the League of Nations for promoting economic development in Palestine. While protecting the imperial interests of Great Britain were certainly important and evident in official communication, Mandate reports show an increased concern for and preoccupation with the plight of the common people, particularly the fellahin. Many of the reports cited in this thesis spring largely or entirely from personal interviews with and observations of exactly the sort of people most colonialist archives neglect. Third, the British did not shape the hegemonic narrative of pre-independence Palestine – the Zionists did. In many instances Mandate reports advocate for the fellah, undermining the power-based narrative rather than reinforcing it. Considering the way the Zionist narrative has come to dominate, research based in even so traditional a source as the British archives can in some ways challenge historical paradigms rather than reinforce them.

Chapter 4: Research Section 1

The purpose of this chapter is to determine whether or not there is a correlation (but not necessarily causation) between the population of Jews in Palestine and agricultural production. Causation will be established in the next chapter through qualitative methods. Specifically I look to answer two hypotheses: H1a: *The growth rate of agricultural productivity accelerated significantly after 1880* and H1b: *Production increases overall were correlated with the level of Jewish immigration into Palestine*.

As discussed in Chapter 3, a complete exploration of the "making the desert bloom" myth would ideally include a discussion of the amount of land under cultivation before Zionist immigration began and then how dramatically that changed due to Jewish influence. Unfortunately, there is a tremendous lack of reliable official sources concerning agriculture in Palestine during the Ottoman period. The central government had little interest and even less ability in accurately measuring the extent of cultivated land in the backwaters of the empire.[60] The only measurements available are rough estimates and narrow in focus, but generally agree with the trend expressed in the non-Zionist literature that there was a great expansion in the area under cultivation both before and after large-scale Jewish immigration began. Lt. Claude Conder, while surveying the region in 1870, provides a vivid example of this change. Visiting the Plain of Esdraelon (now commonly known as the Jezreel Valley), he remarked that less than one sixth of the fertile lowland was cultivated, with the rest dominated by pastoralist nomads. This arrangement, however, could not resist the Ottoman government's slow modernization efforts. As Conder

[60] Owen, 175

creatively describes it, "the Turks wrought a great and sudden change; they armed their cavalry with the Remington breech-loading rifle, and the Bedawin disappeared as if by magic." By 1872, 9/10ths of the plain was being farmed by fellahin.[61] Owen estimates that by the end of the 19th century, 540 000 acres were under cultivation in the districts around Hebron, Jaffa, Jerusalem and Gaza.[62] Without a baseline of how much land was under cultivation at the beginning of my study in 1858, however, I cannot determine the growth rate. Therefore I base my analysis primarily on agricultural production.

The Data

Considering the absence of Ottoman production statistics, I am forced to use consul reports to estimate the agricultural productivity of Palestine up until World War I, as discussed in Chapter 3. British consul reports from Jaffa are easily the most consistent statistics available that concern agricultural production in Palestine during this period and are used extensively in the literature. That is not to say, however, that they are always reliable or consistent. I have had to address several important challenges in collecting and interpreting data, which are explained below.

The first challenge is that the British consul reports are infrequent, often switching which crops they report and which measurements they use. In several cases I have found contradictory data in different reports, and have endeavored to use known trends and the reports' other explanatory sections to resolve these conflicts. I also consulted several American consul reports where they were available but British ones were not. Nevertheless, as can be clearly seen in the data tables in Appendix A, the data is choppy

[61] Conder, Claude R. *Palestine*. London: G. Philip & Son, 1889. *Hathi Trust*. 59
[62] Owen, 245

and has many holes.[63] The reports themselves emphasize the rough nature of their estimates, and any numbers used in this study should therefore be clearly understood to be approximations rather than exact statistics.

In order to overcome these challenges I extensively convert between measurements and focus on crops for which export numbers are most complete. The numbers as I found them and ultimately used them are also contained in Appendix A. The imperial measurement system used by Great Britain at the time was much less precise and uniform than the metric system (which was not adopted until the mid-20th century) but I am confident that I have correctly converted between the measurement systems where necessary, using conversions present in the original source where possible. Many different crops were recorded at some point or another, but for many of these the data is so inconsistent as to be useless for my purposes. Therefore I base my analysis on only a small subset of Palestinian crops and products from the period: Oranges, Wheat, Maize, Barley, Sesame, Olive Oil, Soap (which was made from olive oil), Melons, Watermelons and Wine and Spirits.

The second challenge that I faced in collecting data came from some of the secondary sources that I consulted. Alexander Scholch's comprehensive data tables are a very commonly cited source for agricultural export statistics.[64] He uses kilés, which is equivalent to 36.1 kg, as a measurement for several crops. A cursory look at the consul reports that he cites, however, clearly shows the original reported statistics to be in kilos. Therefore the data as often reported was incorrect by a factor of 36.1. At the time in the

[63] All data comes from the Archival Reports listed in the first section of the Bibliography
[64] Scholch, Alexander. "European Penetration and the Economic Development of Palestine 1856-1882." *Studies in the Economic and Social History of Palestine in the Nineteenth and Twentieth Centuries*. Ed. Edward Roger John. Owen. Carbondale, IL: Southern Illinois UP, 1982. 60.

Ottoman Empire, a measurement known as the Constantinople Kilo was sometimes used, but I have found no source that states or implies that it was also known as the kilé, and in any case it was equivalent to much less than 36.1 kg. I have assumed throughout that the British reports concerned intended to use the kilogram as their measurement, and have corrected Scholch's misinterpretation. In addition, several secondary sources (including Scholch) appear to have completely misstated the actual numbers reported, or perhaps used a source other than the consular reports that I consulted. I have used numbers directly from the original consul report whenever possible, except for some instances where the 1873 American report claimed implausibly enormous production in certain crops which did not match the accompanying data on revenue.

The third challenge lies in coping with large gaps in the data, but they are easily explained and unavoidable. Because my data comes from British consul reports, there is no information available for the years 1914-1920. For the first four of those years, Great Britain and the Ottoman Empire were at war. For 1919 and 1920, Palestine was under British military occupation, leading up to the establishment of the British Mandate for Palestine in 1920 and the resumption of civilian government. The data for the 1920s and 30s come from reports that the British sent to the League of Nations, sharing many of the limitations of the consul reports. These reports were ceased publication in 1939 but were written until 1941. The 1946 *Survey of Palestine* and other documents produced near the end of the Mandate period provide information for missing years up to 1948.

H1a: The growth rate of agricultural productivity accelerated significantly after 1880

The consul reports largely agree with the literature that Palestine was agriculturally unproductive in the mid-19th century. An American consul report from 1859 doesn't even bother to chronicle trade out of Jaffa because it was so insignificant, instead discussing the reasons why the territory was so poor and ways it might be improved.[65] British consul reports from Jaffa in the years 1864-1874 were almost entirely worthless, containing no useful statistical information. The beginning of this period seems to coincide with the appointment of Consul Noel Moore and ends with a limited reorganization of Ottoman provinces that removed Palestine from the larger Syrian administrative entity in 1873. The actual effects of these changes, however, are speculation and ultimately irrelevant for this thesis. While short on specific export numbers, the reports during this decade focused on the lack of trade and the desperation of the peasantry, as the American report did. Consul Moore in some cases did not even bother to vary his phrasing from one year's report to the next, indicating that there was little change in the age-old poverty of the fellahin in Palestine.

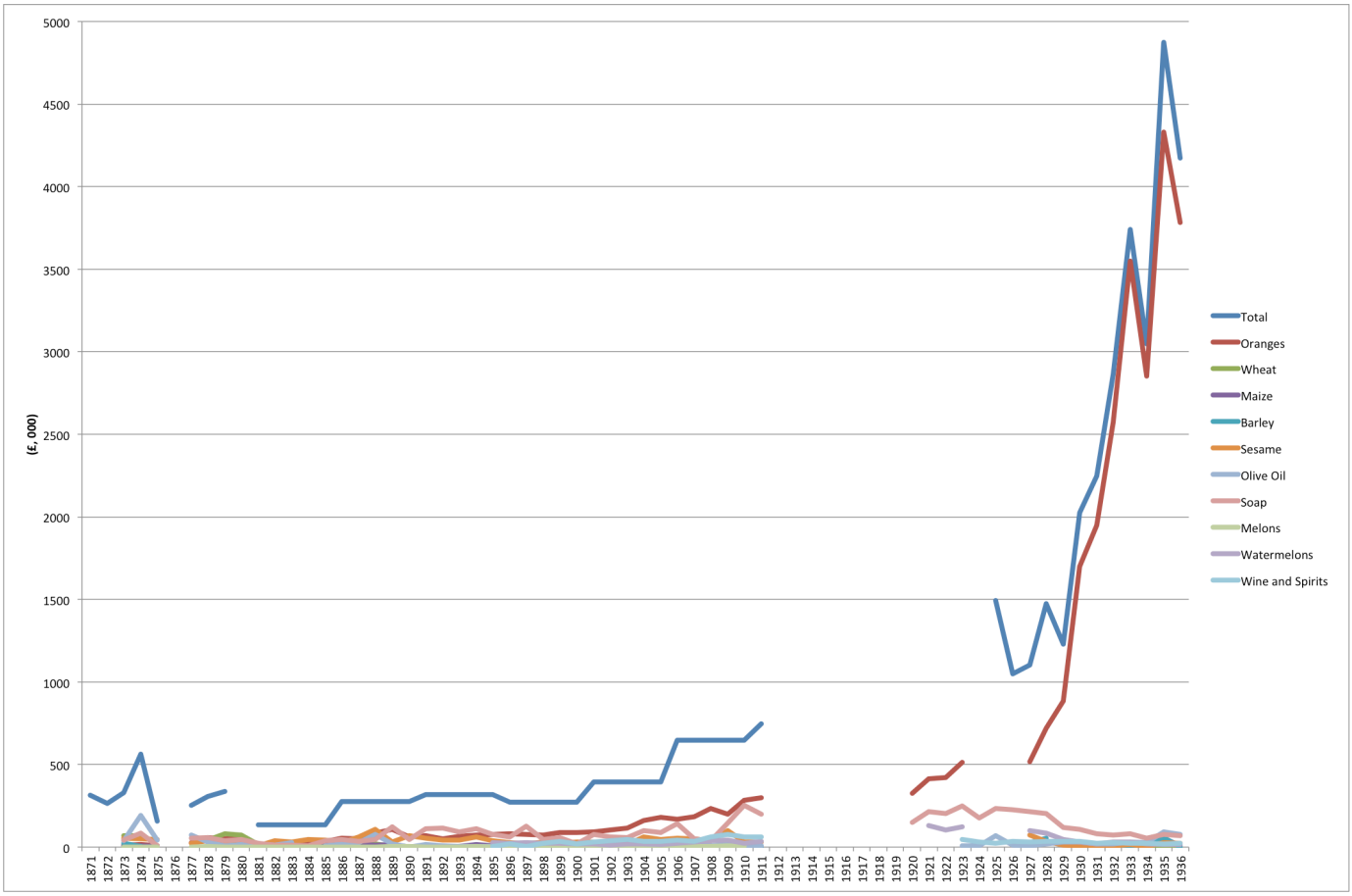
Considering his lack of specifics, I am skeptical of Consul Moore's ability to accurately describe the change that was occurring in the aftermath of the 1858 Land Reform Act. A consul report from 1863, which provides the last clear numbers before this period of misreporting, reports numbers that are smaller than average but mostly within the variation of exports after 1873. I therefore conclude that Consul Moore was largely correct

[65] *Commercial Relations of the United States with Foreign Countries*. Washington: Govt. Printing Office, 1859. *Hathi Trust*. 361.

in estimating that the agricultural export industry in Palestine was growing only marginally if at all in the 1850s, 60s and early 70s.

Beginning in 1873 the data becomes reasonably consistent, particularly for the British pound (£) value of exports. Charting these export values from 1873 to 1937 across the crops listed above results in Figure 1. The clear takeaway is that oranges are overwhelmingly responsible for the rise in the value of Palestinian agricultural exports beginning in the late 19th century and persisting until World War II. Other crops did not see anything near the same dramatic increase in exports by value.

Figure 4.1



However, the use of the £ value of exports rather than total output or export may distort the extent to which the physical territory of Palestine was made more lush and

productive, which is the central tenet of the myth. Overall, the data available on the quantity of a given crop being exported is much less consistent than the £ value of those same exports. Creating a graph similar to Fig. 1 with exports in kilograms would hardly clarify the issue or help resolve hypothesis H1a. Instead I will examine each crop more closely while addressing hypothesis H1b in the section below.

Hypothesis H1a, (*The growth rate of agricultural productivity accelerated significantly after 1880*), appears to be generally true, but with important caveats. First, the orange crop was the overwhelming cause of the growth in agricultural productivity. Palestine did not export most other crops in significantly greater numbers in 1938 than they did in 1873. This is true both of commodities destined largely for local consumption, such as wheat, and those produced almost exclusively for the export market, such as soap and wine. The second caveat is that 1880 was not an important hinge in the growth rate of agricultural produce. Even orange exports did not begin their tremendous ascent until around 1900. This should not be surprising, however, considering the consensus in the literature that Rothschild plantations and farmers of the First Aliyah made a relatively small and impermanent impact on Palestinian agriculture. The next section will evaluate hypothesis H1b and determine with more detail how agricultural production changed in tandem with the growth of the Jewish population of Palestine during the years studied, including examining the variance between crops in more detail.

H1b: Production increases overall were correlated with the level of Jewish immigration into Palestine

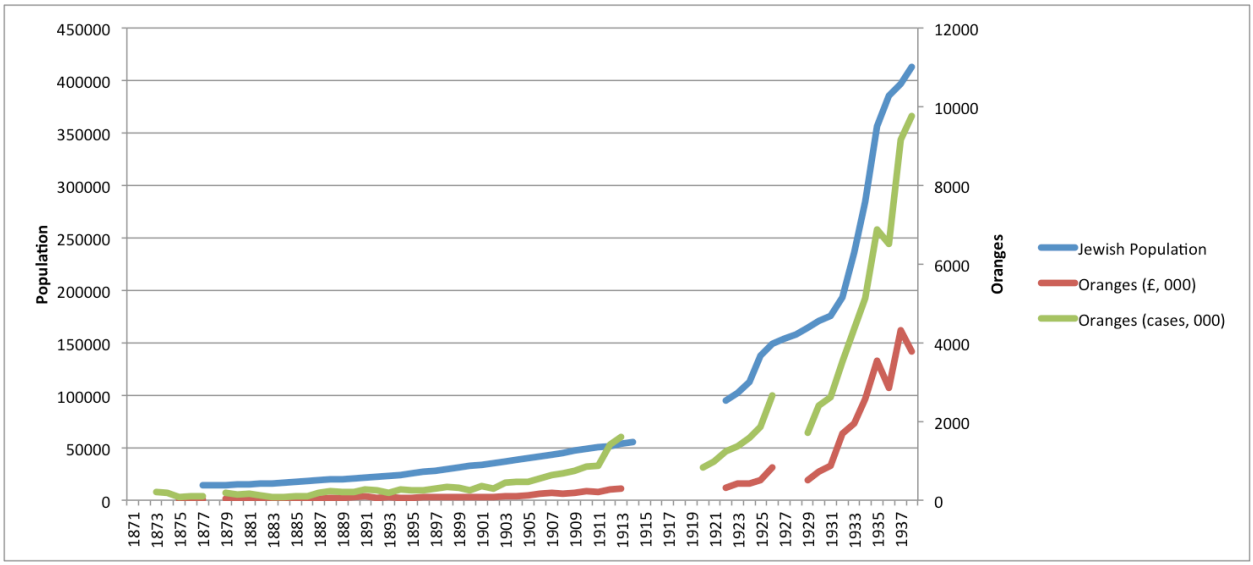
This hypothesis seeks to test whether there is a measureable relationship between the level of Jewish population in Palestine and the productivity of a particular crop or

agricultural product, as defined by various measures. While this very rough approach does not determine causation, it does determine which crops or industries were growing at the same time as Jewish presence in Palestine, and therefore may remove some from consideration as potential sources of the "making the desert bloom" myth. I begin with the crop that has been most closely associated with Zionist immigrants – the famous Jaffa orange.

Oranges

As seen in the section above, the orange crop in Palestine was the major source of export growth in the agricultural sector in the early 20th century. This was blatantly obvious in the comparison between values of exports in Fig. 4.1, but the total number of oranges sold grew in tandem with total value. More relevantly for H1b, however, growth (using both measurements, cases of oranges and total value) closely matches the rise in the Jewish population of Palestine, as shown in Figure 4.2.

Figure 4.2

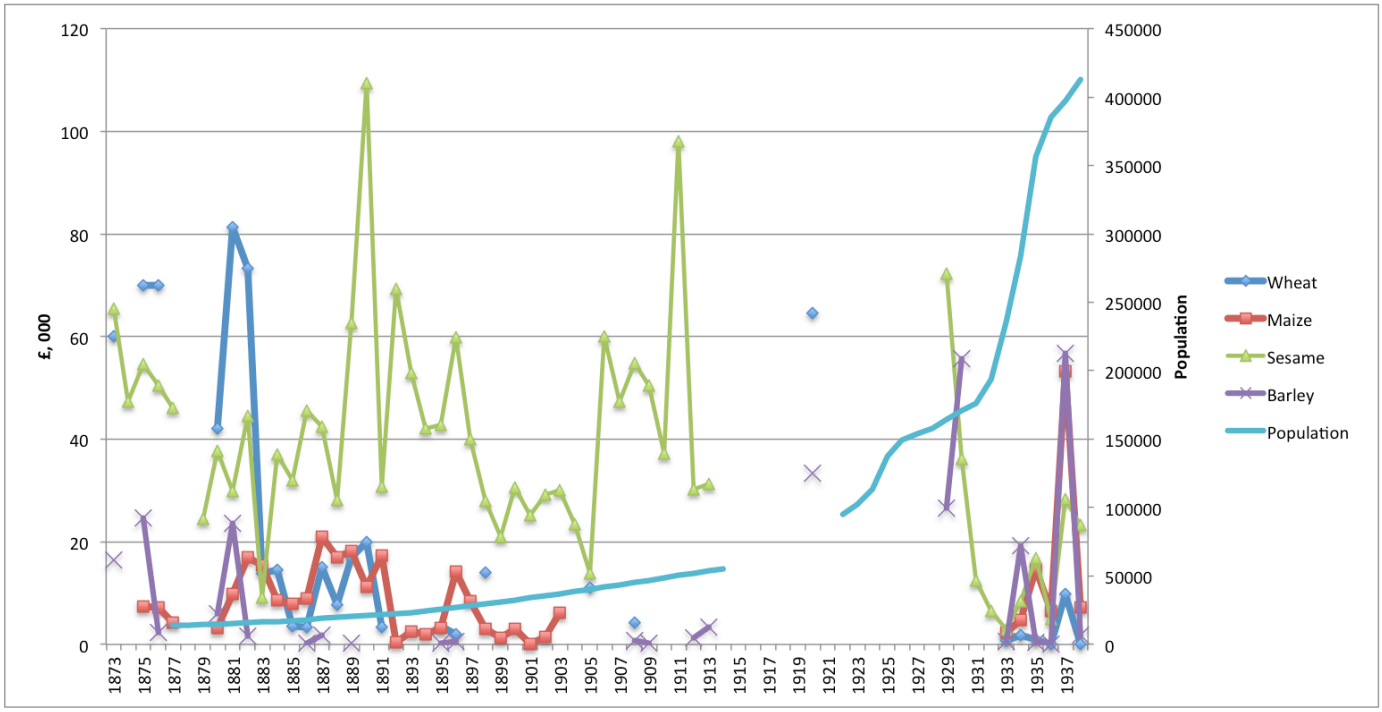


The reasons for the close correlation between orange production and Jewish population will be explored more fully in Chapter 5, the qualitative research section, but oranges were by far the most prominent crop associated with Jewish settlers in the literature, and the data bears that out. It is clear that, at least for oranges, H1b is true.

Cereals

Cereals form a significant part of the crops analyzed for H1a that did not show the kinds of growth rates that oranges did. In this section I take a closer look at the value of exports as well as the quantity and, for the British Mandate period, overall production data. Under the 'cereals' heading I include wheat, maize, barley and sesame. Durra (sorghum) is excluded for lack of data other than pound value of exports. I begin by examining the £-value of cereal exports in more detail (Figure 4.3).

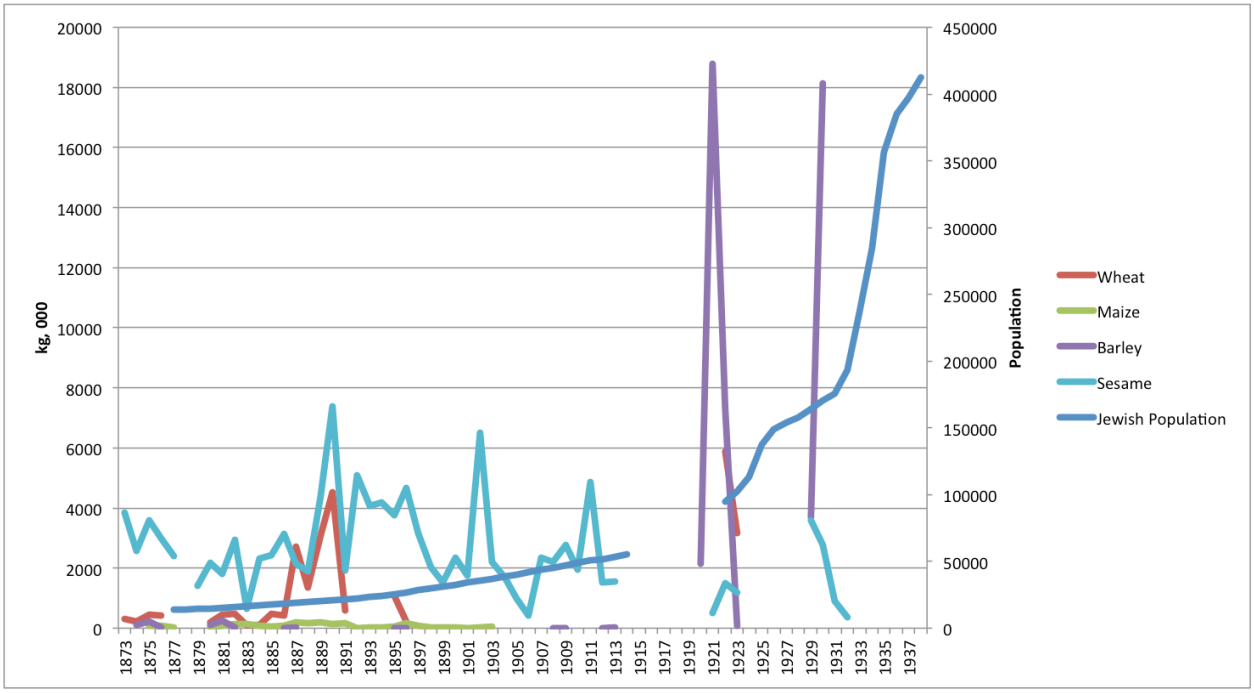
Figure 4.3



This more detailed look confirms what Fig. 1 hinted at: increasing numbers of Jewish agricultural settlers in Palestine did not lead to rising cereal exports, at least in terms of £-value. The data is choppy and missing in many places, but even the most consistent parts show no clear upward trend. Measuring exports in total kilograms rather than value does not clarify the picture (Figure 4.4).

The sheer volume of exports also did not increase as the number of Jewish settlers increased. The large estimates for barley exports in 1921 and 1930 are curious outliers, but not typos, as their respective reports emphasize the difficulty that Palestinian farmers had in making a profit on their grain in these glut years. It demonstrates just how insecure life for the *fellahin* and other rain-dependent farmers was.

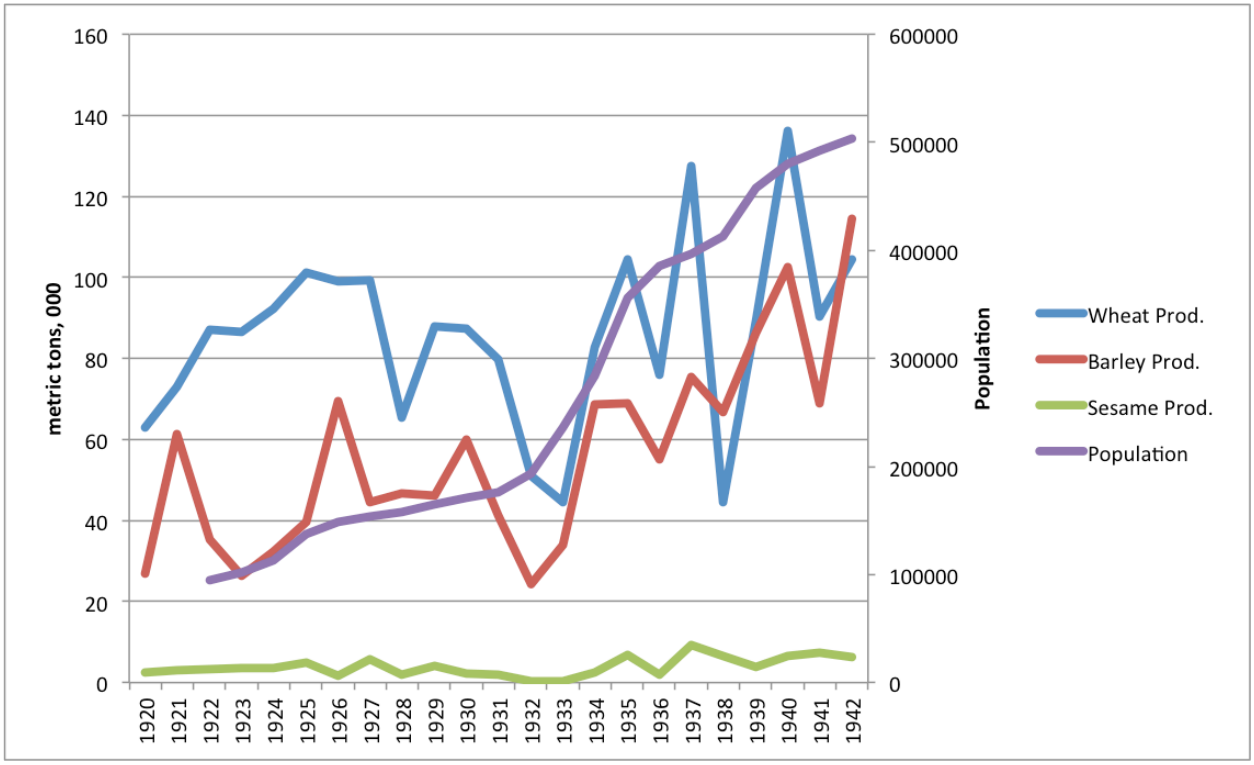
Figure 4.4



For the British Mandate years, total agricultural production statistics are available, although I could locate numbers only from the League of Nations reports used

for exports and the Statistical Abstract of Palestine, 1943 edition, which unfortunately only contained data from the years 1927-1942. The correlation between production and the Jewish population is shown in Figure 5, and here the picture gets a little more complicated.

Figure 4.5



Here at last we see some indications that crops other oranges may have benefited from Jewish immigration. Wheat and barley appear to climb roughly in tandem with the number of Jews in Palestine, at least after 1932, although they maintain the inconsistent patterns shown in fig. 4.3 and 4.4. This is also only after a downturn compared to mid-1920s levels, though they soon surpass them. Curiously, the enormous spike in barley exports in 1931 is not reflected in fig. 4.5. Sesame, meanwhile, is flat. It is entirely possible that total production is relatively unmoored from exports, as cereals relied on rainfall and were grown for local consumption rather than the export market. As the total population grew, increasing local demand could have stunted the growth rates of exports. The

correlation between cereal production and Jewish population will be explored in more detail in Chapter 5. The balance of the evidence argues that H1b is false for cereal production, at least until the early 1930s, as there is no clear indication of correlation and only a weak correlation for a small portion of the sample.

Olives, Olive Oil and Soap

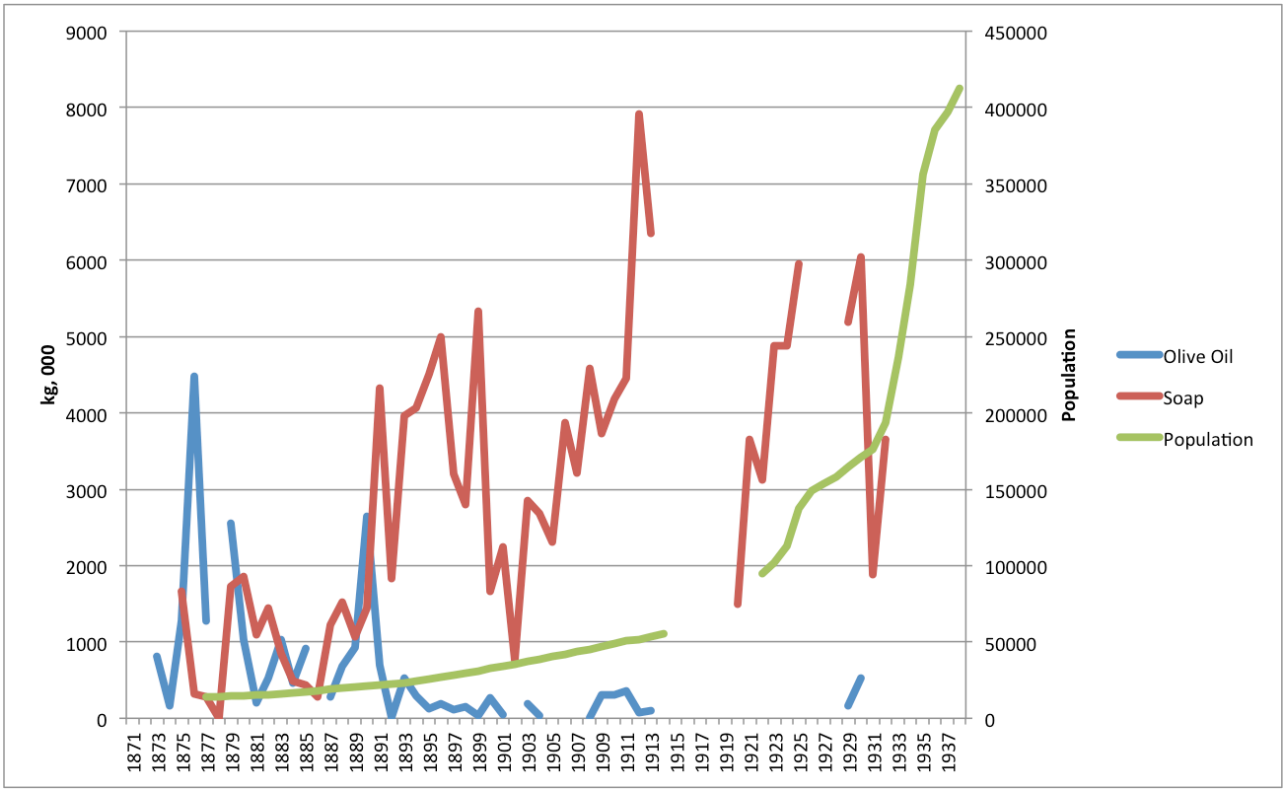
For centuries, the olive has been the most common tree in Palestine and its most common product, oil, was at the center of a soap-making industry based in and around Nablus. Until the growth of the Jaffa orange, Nablus oil soap was perhaps Palestine's most famous and lucrative non-devotional export, renowned for its quality.

Similarly to the cereal crop, olive oil and soap production do not correlate at all with the rising Jewish population in either measurement (£ or kg, Figures 4.6 and 4.7). There is also a rough tradeoff between the oil and soap, however, in both value and mass, which makes sense, as the more olives are used for soap making the less can be turned into soap. Clearly soap production peaked immediately before World War I, but did not manage to continue its growth trajectory under British rule, despite the increased numbers of Zionist settlers.

There are no extensive statistics on the total production of olive oil or soap from the British Mandate period, but the output of olives is recorded. It does not closely correlate with the few years of oil production data available. Nevertheless the total number of olives produced provides a general understanding if the crop was flourishing and growing or not. Fig. 4.8 provides some measure of support to the contention found many times in the consul reports that olive trees produce only every other year. Like in Fig. 4.5, Fig. 4.8 also shows a rough correlation between olives and population. Unfortunately, we do not have

the production numbers from before World War I, when many olive groves were destroyed, to determine whether this increase was a new and positive development or a return to normal production levels.

Figure 4.6



The conclusions for olive-based products are more complex than for cereals. Olive trees were a longtime staple of native Palestinian agriculture, and soap production was the core of pre-Zionist manufacturing, to the extent that it existed at all. Therefore it is not surprising that Jewish immigration would not positively impact the export of soap. But Fig. 4.8 begs the question of whether or not Jewish farmers were instrumental in an increase in olive production overall. Such a question will be addressed in the qualitative analysis chapter; I do not have enough data to answer H1b with respect to olives. For olive oil and soap however, H1b is clearly false.

Figure 4.7

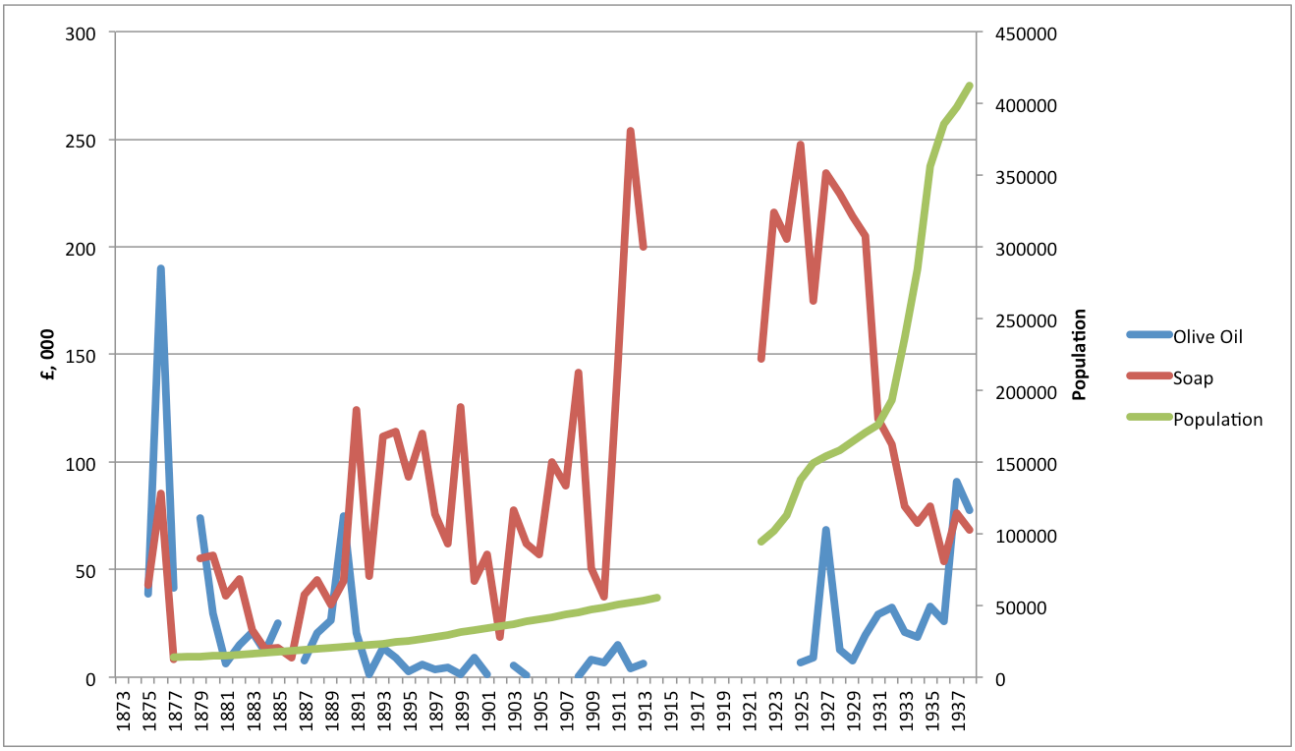
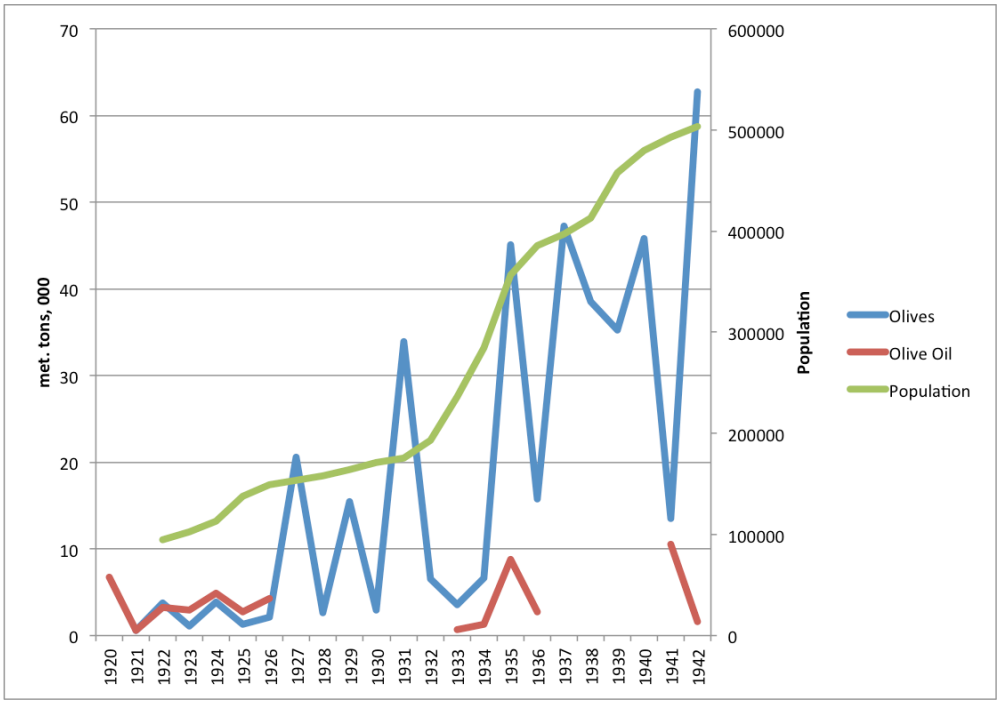


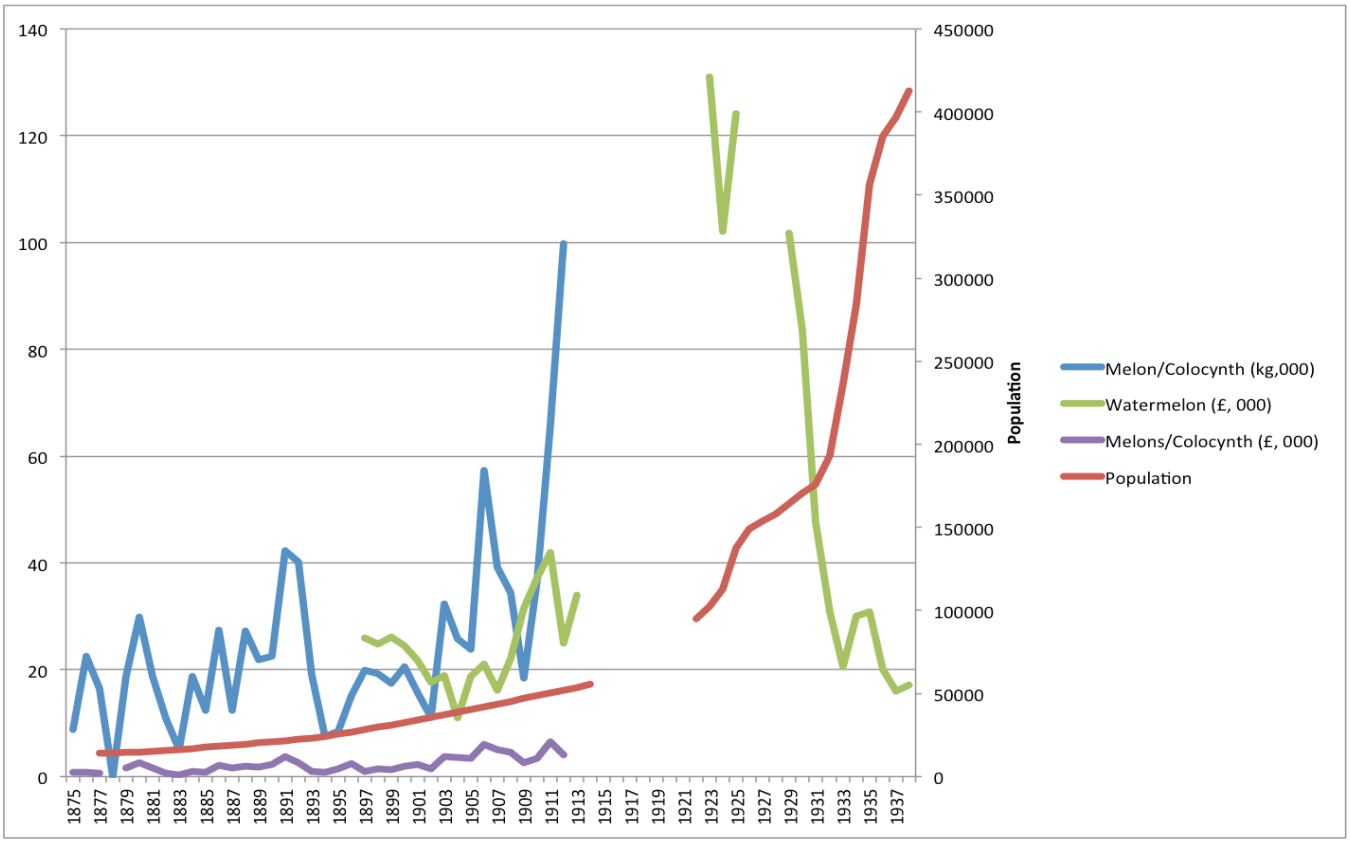
Figure 4.8



Melons

There are two varieties of melons that have been grown in Palestine – the colocynth, or desert melon, and the watermelon. In contrast to cereals, their production was climbing significantly up until World War I, but dropped off during the 1930s (Fig. 4.9).

Figure 4.9



The data presented in fig. 4.9 is separated by melon variety until 1921, at which point both melons and watermelons are calculated together. There is no data available for the quantity of melons exported under the British Mandate, though the value of the produce clearly dropped precipitously. Figure 4.10 demonstrates that this is not because of a drop in production overall, but it may have still been due to an increase in domestic consumption that left relatively little for export abroad. Production of melons between 1927 and 1932 are roughly even, but exports crater in that period.

Figure 4.10

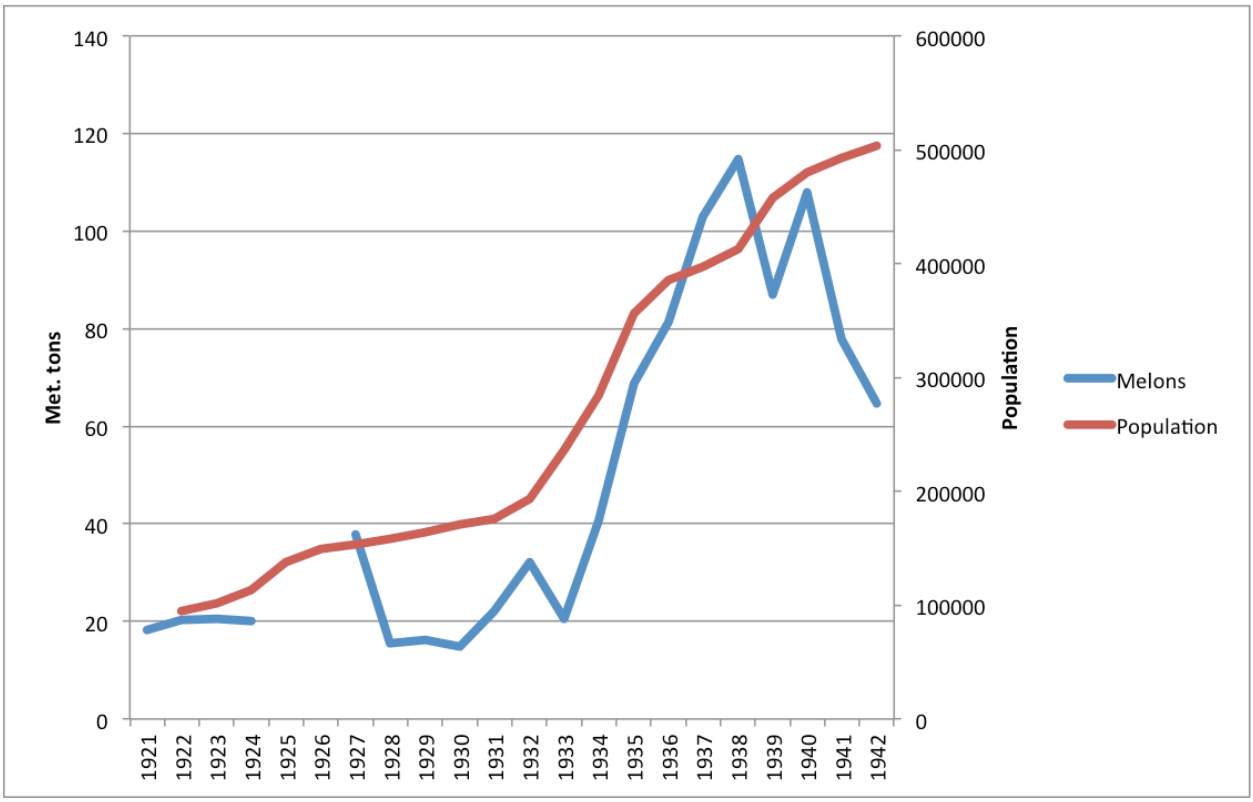


Figure 4.10 provides only a weak case for a positive effect of Jewish immigration on melon growing, considering the significant drop in the late 30s and early 40s. Theoretically the economic difficulties of World War II could have affected the crop, but this drop is unique to melons. Therefore it appears that H1b is unequivocally false for melons and watermelons.

Wine and Spirits

Palestine began to produce wine and spirits only relatively late into the period under consideration in this thesis. 1897 is the first year for which any alcoholic exports appear in the British consul reports, which was already well over a decade into the first Aliyah. The literature tells us that the Rothschild plantations were the first to introduce viniculture and

winemaking to Palestine on a large scale and this section will determine to what extent that initial growth was sustained as waves of Jewish immigrants arrived in the Holy Land.

Figure 4.11

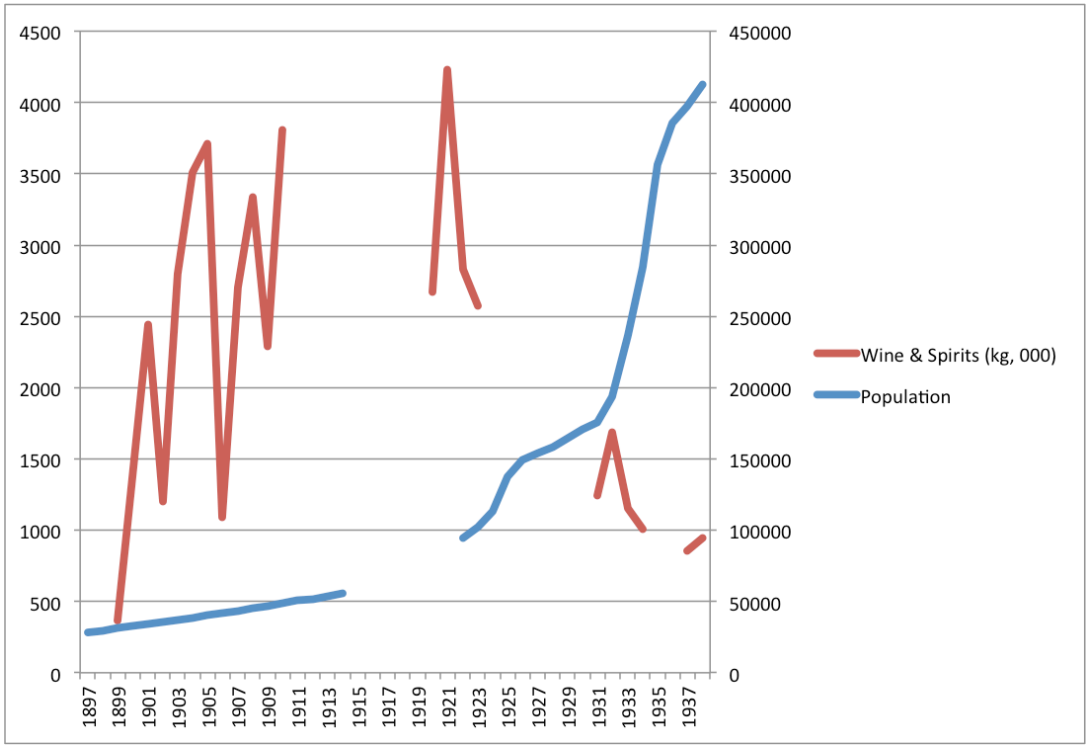
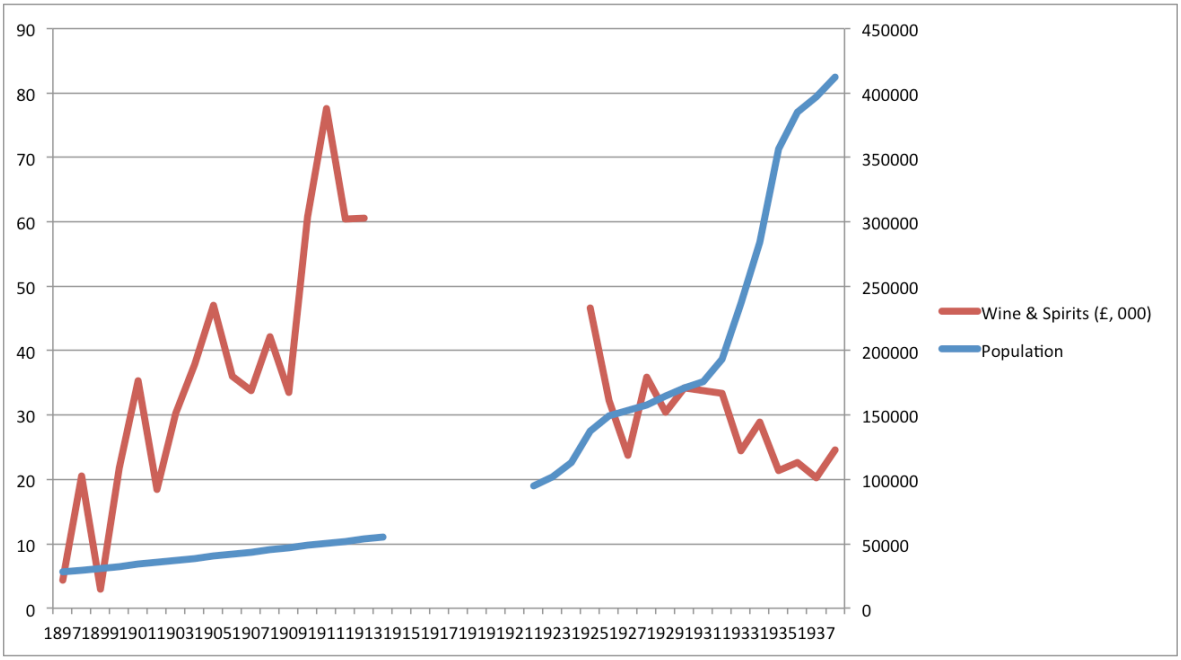
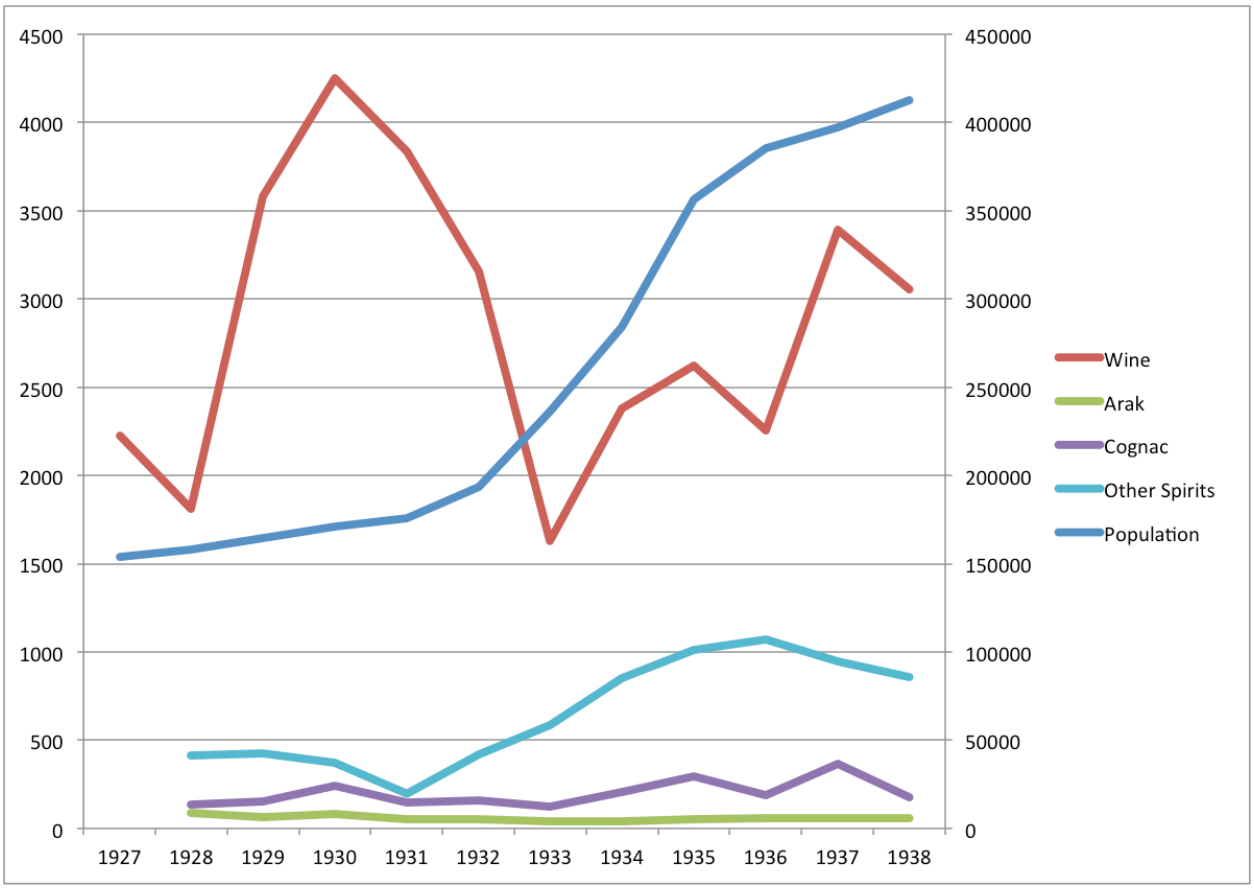


Figure 4.12



Figures 4.11 and 4.12, measuring wine output by value and weight, demonstrate a pattern similar to the melons, where production grows until World War I (or shortly afterwards, in the case fig. 4.11) and then drops significantly during the 1930s. The literature is clear that most immigrants after the First Aliyah did not gravitate towards vineyards, but the drop is surprising, indicating perhaps that Jewish farmers abandoned their grapes to adopt more profitable oranges instead. The production data in Fig. 4.13 does not contradict or support this interpretation, but does strike another blow against H1b, as none of the alcoholic drinks measured mimic the growth rate of Jewish immigration in any significant way.

Figure 4.13



Summary

This chapter has uncovered a story that is far more complex than the simplistic approach of the "making the desert bloom" myth. Zionist claims to have revolutionized Palestinian agriculture seem to have been entirely true for only one major crop: oranges. Meanwhile several others saw negative growth, no growth or only enough growth to keep up with domestic demand – in other words, the kind of growth that might come about simply as a result of increased security and natural population increases rather than the importation of brand new technologies and ways of working. Generally it seems that, outside of oranges, Jewish immigration did little to promote the agricultural production of Palestine as a whole besides introducing some new crops such as wine grapes

The production data from the period of the British Mandate is more pro-myth than export statistics, however. Olives, wheat and barley in particular showed strong growth at the same time as Jewish population in Palestine boomed. These crops were traditionally farmed by the fellahin, and required relatively little expertise or capital to produce. Therefore it is an open question whether these production increases came about due to the investment and innovation that the Zionist colonist brought to Palestine or whether the Arabs (or perhaps the British) were driving the growth. This question will be resolved in Chapter 5.

Chapter 5: Research Section 2

As shown in Chapter 4, Palestinian agricultural production did not increase in earnest until the establishment of the British Mandate after World War I, to the extent that it increased at all. Orange exports began to increase incrementally in the late 19th century, but otherwise all indicators are in agreement. Therefore Chapter 5 will focus on changed in agriculture during the British Mandate and, to a lesser extent, to the twenty years leading up to the outbreak of the First World War.

The goal of this chapter is to understand why production increases happened when they did and what caused those increases. As described in Chapter 3, I hypothesize some of these causes to be: funding and capital; modern agricultural technology; education and expert advice; ideology; communal farming institutions; plantation-style farms. I will examine each hypothesis one its own, conducting a document analysis of reports by British consuls and the Mandate Government as well as outside primary sources to determine the accuracy of each one. Clear yes/no answers are nearly impossible to find for such a confused and politically charged issue, but I will endeavor to comprehensively explain the nuance behind each hypothesis and how I have determined that it is true or false. For historical investigation such as this thesis, simplistic questions are rarely satisfied cleanly. Political-motivated narratives that seek to place credit or blame nearly always over-simplify the history that they attempt to explain. This section attempts to re-establish the nuanced truth.

H2a: Jewish immigration led to an increase in the availability of capital and funding for agriculture in Palestine, which was critical to productivity growth.

Capital is widely and unanimously considered one of the if not the most important factor in the growth of Palestinian agriculture before Israeli independence. At every stage of development and with both Jews and Arabs, either the absence or use of funds was central to the agricultural industry. I examine each community separately, and conclude with a closer look at the orange industry, which was heavily dependent on capital and the dominant crop in Palestinian agriculture during the British Mandate period.

The Yishuv

When Zionism was still little more than a dream, already the Jewish congregations in Jerusalem knew that capital was their main obstacle to reviving a Yishuv grounded in the Land. In a series of letters written in 1874 to Sir Moses Montefiore, a British financier, many different prominent Jews is Jerusalem asked only that he send them the money to acquire land and equipment and they would be able to establish themselves as agriculturalists.[66] The course of agricultural development would prove them entirely correct.

The first and most obvious use for Jewish capital was to buy land on which to build colonies. So from the Jewish perspective capital is the first and most vital requirement for any effort to improve agriculture in Palestine. The earliest settlements, founded in the 1880s, included Petah Tikva, Rishon Le-Zion, Zichron Ya'akov, Rosh Pina, among others. David Ben Gurion, who was one of the early agricultural settlers, says that, other than the

[66] Montefiore, Moses. *Translations of a Letter to the Jewish Congregations in the Holy Land on the Promotion of Agriculture and Other Industrial Pursuits in That Country and of the Replies Received Thereto*. London: Wertheimer, 1874. *HathiTrust*. Web.

initial funding required to buy the land, the early settlements were quite poor.[67] The 1905 Jaffa Consul Report places special focus on these Jewish agricultural colonies and agrees that "their capital was not sufficient for the enterprise on which they had embarked."[68] Their financial crisis eventually led them to approach the Baron Edmund de Rothschild for assistance.

With Baron de Rothschild's money the Yishuv, formerly in danger of collapsing, expanded to new villages and purchased more land. They also began to practice more intensive, export-oriented agriculture. Rishon Le-Zion, which was the first colony to reach out to Rothschild, had planted a crop of mostly wheat, barley, lupins and vegetables; in other words, crops that were cheap to purchase and grow, and largely similar to what the fellahin were planting.[69] By 1892 they were planting high-quality wine grapes imported from France and the United States in large quantities.[70] Petah Tikva, in which Rothschild invested "many millions of francs," planted 500 000 vines in 1893 alone.[71] During the roughly decade and a half following the Baron's takeover, consul reports consistently mention the Jewish wine industry, paying special attention to the high quality of their grape strains and the modern equipment used there. Petah Tikva also began growing oranges near the turn of the century, an export crop that was growing rapidly and brought good returns.[72]

---

[67] Ben-Gurion, David. "From the Founding of Petah-Tikva to the Present Day." The Jews in Their Land. Garden City, NY: Doubleday, 1966. 276.

[68] *"Report for the Year 1904"*
[69] *"Reports from Her Majesty's Consuls*," 1884.
[70] *"Report for the Year 1890-91."*
[71] *"Report for the Year 1904." "Report for the Year 1892."*
[72] *"Report for the Year 1898."*

Ahad Ha'am, a prominent Zionist essayist of the time, likened Rothschild's beneficence to "a never-ending flood of gold."[73]

The flood did end, though, in a way. As discussed in the literature review, Baron de Rothschild gave up direct control of the Jewish settlements that he had sponsored to the Jewish Colonization Association in 1900. This change brought significant reforms in the management, but Rothschild still guaranteed to cover any financial shortfalls.[74] Although decision-making became more decentralized, large inflows of capital were still vital to the colonies' success.

The process by which Jewish settlements became truly independent and self-sufficient was by all indications a long one. Even under the British Mandate, some twenty-five years after Rothschild cut back his support to encourage the colonies to learn to fend for themselves, significant financial shortfalls, debts and subsidies are consistently reported. Indeed the consensus was that many if most Zionist agricultural colonies would collapse without continued subsidization. The Peel Report paints a rather unstable picture of the National Home in 1925 as an experiment liable to fail at any time and reliant on "donations to a missionary enterprise" rather than a "sound proposition" that might attract investment on its own.[75] A series of reports submitted to the Joint Palestine Survey Commission determined that, in 1926, only eight of the thirty-nine colonies surveyed were "consolidated," meaning that they were no longer dependent on subsidies. The nine settlements who had been established for five years or more (including the former Rothschild colonies) ran a deficit that year of $76,280, which had to be made up by

---

[73] Quoted in Ben Gurion, 280.
[74] "*Reports from His Majesty's Consuls*," 1905.
[75] Peel, William Robert Wellesley. *Palestine Royal Commission Report Presented by the Secretary of State to for the Colonies to Parliament by Command of His Majesty.* London: H.M.S.O., 1937. Print.

external funding.[76] It was clear that in the most realistic scenarios it took years for new colonies to become self-sustaining and financially independent.[77]

The Hope Simpson report of 1930 is particularly detailed in explaining the relationship between the Zionist colonies and their sources of funding.

None of the Zionist settlements are self-supporting in the sense that they would be able to maintain themselves without further assistance and pay back to the Keren-Hayesod[78] a reasonable amount towards satisfaction of their debts, and to the Keren-Kayemeth[79] an economic rent. It is indeed admitted that no such consummation is anticipated. Many Zionist settlements would cease to exist if further support were not forthcoming. The P.I.C.A.[80] colonies include in their number several old colonies which are radically established, and which will unquestionably flourish in the future. Even of the P.I.C.A. colonies, however, there are a number, including some of the older colonies, which still require support and in some cases reorganisation.[81]

High Commissioner Herbert Samuel cursorily examined settlement finances in his report on the first five years of the Mandate (1920-1925). He uses Petah Tikva and Degania as stand-ins for independent settler colonies for the former and kibbutzim for the latter. He is decidedly optimistic for both of his case studies, but appears to evaluate self-sufficiency differently than Hope Simpson. Although Petah Tikva has begun to repay its debts related to land purchase (15% of the total value of the colony at the time), it continued to receive a £1400 annual subsidy "for the school and for general communal purposes." Degania had not yet begun to pay rent on their land or interest on their loans, which amounted to £21,200 versus on £19,500 in total assets. Samuel still deems Degania "self-supporting"

---

[76] Mead, Elwood. "The Report of Dr. Elwood Mead and Associates." *Reports of the Experts Submitted to the Joint Palestine Survey Commission*. Boston, MA: Daniels Printing, Incorporated, 1928. 5-65. *Hathi Trust*. Web. 19 Mar. 2016. 39.
[77] Mead, 49-50.
[78] The main institution for financing the Zionist Organization pre-Independence.
[79] Also known as the Jewish National Fund, it provided money used to purchase land in Palestine.
[80] The Palestine Jewish Colonization Association, the successor organization to the Jewish Colonization Agency that took over responsibility for managing the colonies from Baron de Rothschild.
[81] Simpson, John Hope. P*alestine: Report on Immigration, Land Settlement and Development*. London: H.M.S.O., 1930. LLMC Digital. 48-49.

and notes that the inhabitants plan to begin paying back their debts within a year or two.[82] Elsewhere in his assessment, he puts the matter more bluntly, saying "The extend and rapidity of Jewish agricultural colonization are determined by the funds that are forthcoming, not only for land purchase but also for the cost of settlement."[83]

Samuel's serious but optimistic picture of Jewish settlement finances is enticing, but less credible than Hope Simpson's more pessimistic assessment. First, Samuel cautions his reader, "The financial situation of the numerous colonies varies considerably from one to another." He claims that Petah Tikva and Degania "may be regarded as representative," but does not explain why.[84] In fact, his two examples were among the oldest colonies and kibbutzim in Palestine at the time, and therefore were likely to be on stronger financial footing than most of the others. Second, Hope Simpson was charged with evaluating and reporting on immigration and land settlement, rather than simply surveying the administration of the Mandate. Therefore he was more likely to have examined the finances of a wide variety of settlements to arrive at his conclusions. Third, Samuel is more open to bias since, as the outgoing High Commissioner, he would have an incentive to portray the National Home as flourishing under his leadership. Raised an Orthodox Jew, he was also a well-known supporter of the Zionist movement before coming to Palestine. Therefore I accept Hope Simpson's opinion that a large and consistent stream of outside financing was absolutely essential to the growth of Jewish agricultural communities.

Besides simply allowing the rural Yishuv to continue existing, however, capital also made possible some of the incredible development projects that Jewish immigrants

---

[82] Samuel, Herbert. *Report of the High Commissioner on the Administration of Palestine 1920-1925*. Rep. London: His Majesty's Stationery Office, 1925. 35-36.
[83] Samuel, 33.
[84] Samuel, 36.

undertook in Palestine. All else being equal, Jewish settlers and organizations could dream bigger, more modern dreams than their Arab neighbors because they could draw on contributions from Jews around the world to finance them. According to S. Hoofien, a general manager of the Anglo-Palestine Company, Jewish donations, investments and remittances for the 1920s amounted to approximately $220,000,000.[85] Much of this came from a Jewish National Fund program that distributed small blue and white collection boxes to Jewish communities in the diaspora, especially the United States. Upon its 50th anniversary in 1951, the J.N.F. claimed to have raised over $150,000,000 total, largely through the use of these small boxes.[86]

This money was instrumental not only in the founding of numerous agricultural settlements, but also to plant forests, drain swamps, clear wilderness and stabilize sand dunes. The drainage works in particular "improved the general health conditions of the neighbourhoods concerned besides bettering agricultural conditions."[87] It also allowed Jews to experiment with new production methods or crops, purchase and use expensive, modern equipment, etc. For example, the Central Bank of Co-operative Institutions, financed by American and English Jews, was created to provide credit to farmers. Between 1923 and 1927 it struck agreements with thirty-one cooperative societies for approximately £191,000 in loans. This capital went towards financing advances in methods of cultivating tobacco, oranges, grapes and almonds, as well as "general improvement in farm practice

---

[85] "Palestine Agriculture to Be Aided by Drive." *New York Times* 19 Apr. 1931: 113. *ProQuest Historical Newspapers*. Web.
[86] Spiegel, Irving. "Jewish Fund Box Hailed at Jubilee." *New York Times* 20 Jan. 1951: 15. *ProQuest Historical Newspapers*. Web.
[87] *Report by His Britannic Majesty's Government on the Palestine Administration*. Rep. London: HMSO, 1923. Print.

and live stock management."[88] As shown in Chapter 4, orange production in particular skyrocketed, fueled by Jewish investment and worldwide demand for the famous Jaffa Orange. Total land area planted in citrus reached over 130,000 dunums by 1931, an eightfold increase over the period 1922-35, while the Jewish share went from approximately a third to over half.[89] In another example, Jewish Agency funds were used to irrigate land near Affula in the Haifa district, a project that benefited fifteen settlements.[90] Intensive, diverse agriculture became the hallmark of Jewish farms in Palestine.[91] These methods were entirely new to the region, and became widespread thanks in large part to Jews' access to capital. This was not the only reason, as I will show, but it is certainly one of the most important factors and one that was most commonly cited by writers at the time.

The Arabs

While access to capital was a near-universal asset for Jewish farmers in Palestine, the vast majority of Arab agriculturalists could not leverage any meaningful funds for improvement or reinvestment in their farms. Unable to tap into philanthropy from abroad, they remained debt-ridden, impoverished and technically backward well into the British Mandate era.

In 1879, at the dawn of the era of Jewish immigration, there were roughly 400 orange groves outside Jaffa.[92] As Jews had not yet begun to embrace agriculture in Palestine, these groves were by necessity overwhelmingly if not exclusively Arab. The 1881 report cites the capital needs of an orange grove as costing 40-50,000 francs in initial

---

[88] *Report on the Palestine Administration*, 1927.
[89] Horowitz, David. *Economic and Social Transformation of Palestine*. Rep. N.p.: n.p., 1937. *Center for Israel Education*. Jewish Agency, 2014. Web. 25 Feb. 2016.
Report on the Palestine Administration, 1931, 1933.
[90] *Report on the Palestine Administration*, 1933.
[91] *A Survey of Palestine*. Jerusalem: Printed by the Government Printer, 1946. 374.
[92] "*Reports from Her Majesty's Consuls*," 1879.

funding to plant the trees, dig an irrigation well and nurture them until they began production four or five years later. At that point the grove would bring approximately a 10% profit per year, or 4-5000 francs.[93] This return was consistent, motivating many farmers to expand their orange groves or invest in new ones, but it is clear that only a small minority of Arabs could afford the significant financial outlays required to plant and tend a citrus grove. As the literature review showed, these were the *ayan*, also known as *effendi* or notables. By 1901, there were over one thousand acres planted with over one million orange trees outside Jaffa, with both numbers continuing to climb.

Meanwhile, access to credit or capital was prohibitively expensive for the vast majority of Arabs, the fellahin. The dominant themes in the financial lives of Palestinian farmers under Ottoman rule were debt and crushing tithes.[94] The 1912 consul report claims that taxes had forced peasants to cut down their olive trees in some cases, and that a revision of these policies would allow thousands more acres to be planted with fruit trees.[95] These stories are very plausible, as the Ottoman taxation system demanded a portion of expected produce, and therefore by having more trees a farmer ran the risk of suffering a higher tax rate than he otherwise would. The typical fellah was also saddled with debt, and had little access to capital besides emergency loans at exorbitant interest rates from professional moneylenders or their landowners. There were several banks operating out of Jaffa, but interest rates were also high there.[96] The Ottoman Agricultural Bank, established in 1905 or 1906, did make loans to farmers, but it is unclear whether it had any significant impact on agricultural growth, as most fellahin were far removed from the city and had

---

[93] *Reports from His Majesty's Consuls,* 1879. *Reports from His Majesty's Consuls,* 1881.
[94] *"Report for the Year 1911." "Report for the Year 1912".*
[95] *"Report for the Year 1911."*
[96] *"Report for the Year 1903."*

little if any collateral to offer. In all likelihood it catered mostly to relatively well-off citrus growers living in or near the city rather than the mass of desperately poor farmers.

World War I was in many ways an added calamity for the fellahin. The country lost much of its labor force to conscription into Ottoman armies, wood requisitions destroyed much of the remaining forest cover, including some olive groves, and the army's need for draft power deprived many farmers of their plowing animals.[97] As the Turkish army retreated from Palestine during the war, the Ottoman Agricultural Bank funds were removed to Istanbul and that credit system, inadequate as it was, came to an end.[98] The British military administration recognized that the loss of this facility was a significant setback for agricultural development and initiated a program with the cooperation of the Anglo-Palestine bank to make small loans to cultivators in order to enable them to purchase seed and draft animals.[99] Herbert Samuel claims that this effort "went far to save the situation for the agriculturalists of Palestine."[100] This claim is likely hyperbolic to an extent, considering Samuel's interest in overstating the economic development he oversaw as High Commissioner. By 1923 the number of installments falling into arrears was climbing and the program was terminated, having issued £548,227 in loans.[101] This number, meanwhile, was dwarfed by the amount of Jewish capital entering Palestine over the same period.[102]

---

[97] Samuel, 16.
[98] *Report of 9 May 1919 by the Chief Administrator of the Occupied Enemy Territory Administration South*. Quoted in Smith, Barbara J. *The Roots of Separatism in Palestine: British Economic Policy, 1920-1929*. Syracuse: Syracuse UP, 1993. 112.
[99] Ibid.
[100] Samuel, 16.
[101] *A Survey of Palestine*, 349.
[102] *A Survey of Palestine*, 348.

During the majority of the decade, therefore, the government did nothing to ensure fellahin access to capital in order to improve their agricultural methods. The only two consistent sources of capital were from the moneylenders who charged abusive interest rates and from the sale of land to Jewish settlers, with the former method being used mostly by the fellahin and the latter by landowning notables. Jewish capital was never directly invested in Arab business or farms.[103] According to the Peel Report, the capital derived from land sales allowed the effendi to place over six times more land under citrus cultivation in 1937 than in 1920, playfully terming this effect "fructifying."[104] Even the large amounts of capital resulting from land sales could not measure up to Jewish expenditure, however. Many Arabs who attempted to mimic the modern agricultural practices seen in Jewish villages fell into serious debt.[105]

A witness appearing before the Royal Commission at the time called this explanation "inconsistent with the facts," claiming that the Arabs did not in fact reinvest the money obtained.[106] He was likely referring primarily to fellahin, who remained overwhelmingly poor due in part to drops in world food prices and endemic drought.[107] Any revenue from sales by poor farmers likely went to erasing debts rather than investing in more modern agricultural techniques. Hope Simpson dedicates considerable space to describing the financial straights the average Arab farmer was in. He quotes a note submitted for the report from the Director of the Department of Education.

> The economic state of the agricultural population is desperate. Hardly any Arab village exists which is not in debt. The fellahin are so over-taxed that they find great difficulty in paying the tithe. Moreover, after an excellent harvest, they are unable to sell

[103] Erskine, Steuart. *Palestine of the Arabs*. 1935. Reprint. Westport, CT: Hyperion, 1976. 102.
[104] Peel, 126, 129.
[105] Peel, 269.
[106] Peel, 269.
[107] Peel, 127.

their corn or barley or oil. In 15 villages recently visited by the writer in Galilee, the same desperate state of affairs was evident. Money is so scarce in some places that the people purchase the necessities of life by barter, and they cannot pay the tithe without further borrowing. This means increasing their already overwhelming debt to the moneylender.[108]

The debt referred to derives from the fact that the average fellah's yearly income usually cannot cover the tithe and living expenses. After going to the moneylender, the cost of interest on loans is added to these needs. Hope Simpson determines that the average fellah's income after tithe to be £30, and the average family's debt to be £27 with an interest rate commonly being 30% or higher. The tithes were calculated based off of the price at which crops had sold the year before in the town market, which was higher than the return that the fellah typically saw. Any drop in prices was therefore disastrous and tithes, not to mention repayment on debts, could easily become unbearably onerous.[109]

These hardships, needless to say, left the fellah with "no margin whatever for improvements" to his farm, as Hope Simpson put it.[110] Worse, it also removed any incentive to do so, as the benefits of the extra work (and extra debt) would be subsumed into the enormous amount that he already owed.

So long as a small cultivator sees the burden of his debt to be so great and the rate of accruing interest so high, that not only the present produce of his fields but even the increased amount of produce which he may hope to secure by minor agricultural improvement are insufficient to pay off his creditors, he will make no sincere attempt to alter his plan of cultivation.[111]

---

[108] Simpson, 65.
[109] Simpson, 69.
[110] Simpson, 66.
[111] *Report by Mr. C. F. Strickland of the Indian Civil Service on the Possibility of Introducing a System of Agricultural Cooperation in Palestine,* 1. Quoted in El-Eini, Roza I.M. "Rural Indebtedness and Agricultural Credit Supplies in Palestine in the 1930s." *Middle Eastern Studies* 33.2 (1997): 316. *Routledge*. Web. 25 Feb. 2016.

If the fellah was only provided capital and some instruction in modern agricultural methods, however, "there is little doubt that… he would rapidly improve his position."[112]

Hope Simpson's observations on the debt of the fellahin and many of his suggested reforms were echoed in the Shaw Report and the Johnson-Crosbie Report.[113] Both were issues during a prolonged drought from 1928-1932, which dramatically worsened the financial struggles that they witnessed. In response, the British government enacted certain measures to address the fellahin's debt problem and empower them to reform and modernize the Arab agricultural sector.

After overcoming some bureaucratic difficulties getting started, the British circulated a pamphlet in Arabic detailing the advantages of co-operative societies for the provision of credit in a village and how they might be formed. Focusing on 74 villages, numerous meetings with the villagers were held which produced "most satisfactory" results and an initial group of fourteen societies, funded by means of loans from Barclays Bank at 7% interest.[114] These co-operative organizations were promising, and grew rapidly.[115] Unfortunately, they were not given the opportunity to demonstrate how effective they might be in reducing rural indebtedness. The riots and domestic unrest in Palestine from 1936-1939 dramatically reduced the number of co-operative societies from sixty to four.[116]

The government also made arrangements with Barclays for the provision of loans to smallholders and cheap access to seed and/or financial relief following droughts or locust

---

[112] Simpson, 66.
[113] Shaw, Walter. Report of the Commission on the Palestine Disturbances of August, 1929. London: H.M. Stationery Off., 1930. HathiTrust. Web. *Report by Mr. C. F. Strickland.* Quoted in El-Eini.
[114] *Report on the Palestine Administration*, 1933. 12-13.
[115] *Report on the Palestine Administration*, 1934. 235.
[116] *A Survey of Palestine.* 362.

outbreaks.[117] Laws were changed to ease the burden on Arab farmers and encourage the provision of secure title to agricultural land.[118] In this way the British administration made significant progress in alleviating the age-old financial struggle of the fellahin. Easier access to capital also meant that the average Arab farmer, beginning in the early 1930s, could access some of the improved agricultural education and infrastructure that the British brought to Palestine. Before this period, most Arab farmers were unable to break a cycle of poverty and debt that prevented any investment or progress in methods of cultivation.

In summary, access to capital was absolutely indispensable for any Palestinian agriculturalist to develop his farm. Across the board, Jewish settlers had much better access to funds than their Arab counterparts. This gap was closed somewhat by the large sums paid out for Jewish land purchases, which primarily went to increasing orange production, and by government programs to alleviate debt among the fellahin and make affordable credit available. These programs were largely effective but by their nature slow in making significant change. As a whole, access to capital was in fact critical in determining the productivity of a farm in Palestine, but Jewish immigration can only claim a portion of the credit for enabling the increase in Arab agricultural reinvestment.

H2b: Jewish immigration led to an increase in the availability of modern agricultural technology in Palestine, which was critical to productivity growth.

In the late 19th century, agriculturists in Palestine had access to only the most primitive and meager of technology. Writers are unanimous in describing the typical Arab farm as infertile, without any irrigation, modern implements or productive seed and animal

[117] *Report on the Palestine Administration*, 1933. 24-25.
[118] *A Survey of Palestine.* 365.

strains. The orange groves of Jaffa, which produced Palestine's most lucrative crop per unit, were irrigated using mule-powered pumps. Peasants threshed their grain by having oxen trample it on the village threshing floor rather than with a machine.[119]

The arrival of the German Templar colonists and eventually Jewish settlers brought the first modern, European farm implements to Palestine. The Germans, more numerous and well established that this point, were planting more diverse crops than the Jewish wine grape monocultures. They therefore provided a better model for Arab farmers to emulate, as well as competition. Nevertheless, the use of modern equipment in these pockets did not lead to their widespread adoption.[120] As the Jewish colonies embraced orange cultivation, however, their relevance for the wider agricultural scene increased. The modern and scientific methods employed there were "an example… before the native rural population of the manner in which agricultural operations are conducted on modern and scientific principles."[121] The oil-powered water pump, however, was first introduced through a German firm, likely to the Templar colonies, and from there spread to the general orange-growing population.[122] Its use greatly increased the efficiency of irrigation.

The Jewish colonies, flush with Rothschild and the JCA's funds, were equipped with large, modern wine cellars, and beehives, a rarity in Palestine at the time.[123] This cultivation was nearly exclusively the prerogative of the Jews and the Germans, however. Therefore although wine became "the most important industry of the country," it had little effect on the majority of Palestinian agriculturists. Indeed when consul reports discussed

---

[119] "*Reports from Her Majesty's Consuls,"* 1881.
[120] "*Reports from Her Majesty's Consuls,"* 1886.
[121] *"Report for the Year 1900."*
[122] Ibid.
[123] *"Report for the Year 1904."*

the beneficial effect of Jewish and German settlements on their Arab neighbors it was confined to orange and grape production.

Despite the growth and change in these high-capital sectors, the fellahin saw no improvement in their traditional agricultural implements.[124] The traditional plow, although much maligned in Zionist literature, was ideal for its task. "No improved plough could be used, as the soil is in the most cases not deep enough."[125] As orange cultivation spread south from Jaffa to Gaza's environs, the consuls began to dedicate space in their reports to agriculture in the south of Palestine. Their assessments mirror developments in Jaffa. The peasants, still using "the most primitive and simple" agricultural methods, could not afford to adopt more modern ones and would not consent to use them even if they could.[126] An exhibition was made of a reaping machine, but the peasants refused to use it.[127] This suspicion of untried modern methods likely arises from the fellah's precarious position, where a gamble with the harvest necessarily entails a gamble with his family's lives. Meanwhile, twenty orange gardens were established outside Gaza, of which fifteen were machine-irrigated.[128] Technology was having a meaningful impact on the Arab agricultural sector, but only for those farmers able to afford it.

Under the British Mandate, the government recognized the importance of modern equipment to continued viability of the fellahin way of life. There was a general recognition that, with the abrupt drop in prices and increase in trade after World War I, primitive methods of agriculture could no longer compete in a world market.[129] In addition

---

[124] *"Report for the Year 1903."*
[125] *"Report for the Year 1906."* Simpson, 66.
[126] *"Report for the Year 1907."* 23-24.
[127] Ibid.
[128] *"Report for the Year 1910."*
[129] *Report on the Palestine Administration*, 1922.

to the credit facilities discussed in the previous section, the Mandate government also distributed better seeds varieties and new crops to Arab farmers.[130] They also successfully promoted artificial fertilizers beginning in 1924 and beekeeping and poultry in 1925.[131] The attendant advances likely went overwhelmingly to Jewish farmers or some wealthier Arabs, since their introduction coincided with the end of the government's loan program for fellahin.

The drought years at the end of the decade and the Mandate government's new focus on fellahin development resulted in the increased introduction of modern agricultural technology into the Arab rural sector. K. W. Stead's[132] 1931 report on the Economic Conditions of Palestine mentions the increasing fruit production in the hills, a region devoid of Jewish or German settlements.[133] The well-received promotion of co-operative societies helped the fellahin access the benefits of expanding poultry raising, beekeeping and the English bulls, rams and goats the government shipped to Palestine to loan to farmers for breeding with local stock.[134] Poultry was perhaps the most important of these projects and was eagerly accepted in all of Palestine. All Jewish villages kept large flocks of high-yielding European breeds, and the improved breeds were "very great value" to Arab villagers.[135] Beekeeping, which had before been the province only of the Jewish farmers, also became common in Arab areas.[136]

---

[130] *Report on the Palestine Administration*, 1923.
[131] *Report on the Palestine Administration*, 1924, 1925.
[132] Head of the Customs Department at Haifa
[133] Stead, K. W. *Economic Conditions in Palestine*. Rep. London: His Majesty's Stationery Office, 1931. 26.
[134] *Report on the Palestine Administration*, 1931. 157-159.
[135] Simpson, 77.
[136] Simpson, 105.

Meanwhile, improved seed strains were made available to peasants for free or for nominal sums to combat the ravages of the drought.[137] Demand for this improved seed was high and remained so through World War II and was consistently cited as one of the most effective and popular programs run by the Department of Agriculture. Wheat and barley seed tended to be get mixed in with the native, less productive strain on village threshing floors (not in Jewish farms), but these were not the only crops covered under the program.[138] It also enabled smallholders to dramatically expand the land area devoted to novel crops such as potatoes and tomatoes. Production of the latter increased from less than 8000 tons in 1931 to over 60,000 in 1945, while the former grew from 821 tons to well over 32,000 tons in the same time frame (see Appendix). These foreign varieties proved their worth and farmers, both Jewish and Arab, responded by doubling the acreage of vegetables in only two years.[139]

These more productive crops were being cultivated in more and more modern ways. As late as 1934, the Department of Agriculture's Annual Report deemed it "questionable (to) advocate the use of expensive agricultural machinery and modern labour saving devices for the small holder. The Arab cultivator has neither the power to work nor the money to purchase them."[140] Yet by 1936, these same Arab cultivators were finally gaining access to advanced equipment. The government used agricultural extension stations to make seed cleaning and sorting machines available to farmers.[141] They removed weed

---

[137] *Report on the Palestine Administration*, 1932. 179.
[138] *A Survey of Palestine*, 344.
[139] *Report on the Palestine Administration*, 1940. 220. *Department of Agriculture and Fisheries Annual Report for the Year 1945-1946*. Rep. Jerusalem: Government Printing, 1947. 28.
[140] *Department of Agriculture Annual Report*, 1934. 23. Quoted in El-Eini, Roza I.M. "British Agricultural-educational Institutions in Mandate Palestine and Their Impress on the Rural Landscape." *Middle Eastern Studies* 35.1 (1999): 109.
[141] *Report on the Palestine Administration*, 1936. 52.

seeds from the harvest and graded the seeds by size. Meanwhile, "both Arab and Jewish farmers are purchasing tractors, threshers, reapers and cultivators."[142] While the Jews had been using such machinery for years, the mention of Arab purchasers is entirely new. This trend, particularly in regard to tractors, continued through the end of the Mandate, although Jews maintained a decisive edge in the total number of agricultural machines owned in Palestine.[143] In 1941 over half a million dunums were plowed by tractors, largely thanks to the government loan programs established a decade before.[144] This number includes Jewish lands, but oranges and vines, which cannot be plowed, dominated many colonies.

These government programs were clear successes in introducing more modern and lucrative agricultural methods to the Arab cultivators of Palestine. Nevertheless their impact should not be overstated. The Peel Commission applauds the Department of Agriculture's efforts to promote development among the fellahin, saying that some fellahin were "on their way to becoming better cultivators, … learning better methods, using better seeds and better tools, under official guidance and inspection," but that "the great majority are still wedded to their old primitive ways."[145] Whether this is because of a lack of education or of capital is not clear. Most poor Arab farmers clearly balked at the risks involved in moving away from their time-tested methods. To some extent this makes it all the more impressive that the government's efforts could return the results that they did. In many cases the fellahin's progress began at a baseline of nothing, so any notable growth in, say, the number of fields planted with potatoes, would seem significant to a British eye although it might not represent a meaningful shift in Palestinian agriculture as a whole. The

---

[142] *Report on the Palestine Administration*, 1936. 278.
[143] *Report on the Palestine Administration*, 1937. 265. *A Survey of Palestine*, 313.
[144] *Report on the Palestine Administration*, 1941. 498.
[145] Peel, 127.

process of making a serious transformation in the agricultural sector as a whole would have taken years, perhaps decades.[146] Due to the unrest in 1936-39, World War II and the end of the Mandate in 1948, the development process in Palestine simply did not have that much time.

Compared to the moderate progress made by the government, Jewish settlers had hardly any influence spreading modern agricultural technology in Palestine. Jewish capital was understandably not used to alleviate the debt crisis or to provide Arabs farmers with European breeds and crop strains, as it was needed to make improvements on Jewish farms. They were not political positioned or inclined to directly impact Arab agricultural development, and the Zionist sources do not claim to be. The only instance of such comes from one of several books published in the United States attempting to educate Americans about the growing colonies of the Yishuv. In it, Abraham Revusky claims that some of the seeds and seedlings distributed to Arab farmers were grown in Jewish settlements.[147] He may be referring to a regular consignment of saplings purchased by the Forestry Department for reforestation projects, but in any case the government also had its own seed farms from which the majority of their distribution was likely sourced.

In fact, Jews may have gained more from the government's modernization efforts than the Arabs; the majority of requests for information and assistance sent to the Department of Agriculture came from Jewish farmers rather than the more numerous Arabs, and their prior experience with modern agriculture better prepared them to incorporate the technical advice provided to them.[148] This experience, however, was not passed on to the Arabs. The Jews were hardly experts in the use and maintenance of their

---

[146] Peel, 271.
[147] Revusky, Abraham. *Jews in Palestine, by A. Revusky*. New York: Vanguard, 1936. 42.
[148] Israeli State Archives, Gp7/Ag/14/Box633. Cited in El-Eini, 109.

own agricultural combines and generally did not employ Arabs or actively share their agricultural expertise with their neighbors.[149] While the increased availability of agricultural technology was a significant cause in the transformation of Palestinian agriculture leading up to 1948, Jewish immigrants were not responsible for the changes. The government of the British Mandate bears the bulk of the responsibility for incentivizing and promoting agricultural modernization. The hypothesis *Jewish immigration led to an increase in the availability of modern agricultural technology in Palestine, which was critical to productivity growth* is therefore only partly true since technology was certainly critical to growth, but Jewish immigration played only a small role in making it so.

H2c: Jewish immigration promoted agriculture on an educated, expertly advised basis in Palestine, which was critical to productivity growth.

Zionist writings, and to a significant extent the British reports as well, tend to describe Jewish settlements as exerting a positive influence on the surrounding Arab farms. These predictions and descriptions are usually vague,[150] but most often focus on the settlements as models of modern agricultural techniques. Indeed this is where the majority of literature comes down: access to agricultural education and expertise made a meaningful impact on Palestinian agriculture, both Jewish and Arab.

Under Ottoman rule there was no mechanism in place for educating the fellah about modern agricultural methods. Ignorance was in fact one of the prime obstacles to greater

[149] Campbell, Sir John. "Report on the Jewish Settlements." *Reports of the Experts Submitted to the Joint Palestine Survey Commission*. Boston, MA: Daniels Printing, Incorporated, 1928. 431-478. *Hathi Trust*. Web. 19 Mar. 2016. 447. Simpson, 50. Erskine, 101.
[150] For example, see *Memorandum Submitted to the Palestine Royal Commission on Behalf of the Jewish Agency for Palestine*. 1936. Reprint. Westport, CT: Greenwood, 1975. Print.

prosperity.[151] The possibilities, should a group of well-educated and experienced settlers come to Palestine, were clearly demonstrated by the German Templar colonies. Their superior techniques served as models for the native farmers, particularly as they would take in Arab apprentices.[152]

Far before significant Jewish immigration into Palestine began, the Alliance Israelite Universelle founded the Mikveh Israel agricultural school in 1870. The school provided "a very fair training in agriculture" for local Jews, creating a small class of trained agriculturalists before the founding of the New Yishuv.[153] During the Rothschild years, they were often sent to Paris to complete their education and specialized in viniculture.[154] They were small in number, however, did not necessarily return to Palestine to ply their trade.[155] Meanwhile, the settlers of the First Aliyah were entirely inexperienced in agricultural matters, reliant on what they learned in Palestine and subsequently the experts sent by the Rothschild organization.[156] In the first years of Jewish citriculture they learned more from their Arab neighbors than from the handbooks provided to them.[157] This pattern would reverse itself in future years.

Both the commendable initiative of the settlers and their inexperience showed themselves in experiments in cotton cultivation conducted in the first decade of the 20th century. The experiment began in 1904 on 200 acres, but initially failed "due to the incapacity and laziness of the natives."[158] The British consul opines that a European

---

[151] "*Reports on His Majesty's Consuls,"* 1881.
[152] "*Reports on His Majesty's Consuls,"* 1886.
[153] *"Report for the Year 1896."*
[154] *"Report for the Year 1899."*
[155] *"Report for the Year 1905."*
[156] Ibid. Ben Gurion, 276.
[157] Erskine, 75.
[158] *"Report for the Year 1905." "Report for the Year 1906."*

specialist in possession of 300 acres could set such an example as to cause spread cotton cultivation all across Palestine, indicating that expertise was the missing ingredient for success.[159] Some years after it was first attempted, a cotton trial at one of the Jewish settlements succeeded thanks to the input of knowledgeable cultivators, and many landowners (mostly Arab, presumably) were preparing to imitate the effort.[160] Nevertheless a year later no large-scale cotton cultivation was underway, and experiments continued for several years at Petah Tikva.[161]

Despite the cotton experiments' struggles, the early Jewish settlements' beneficial effect on their districts was evident to the British Consulate staff before World War I and became a core feature of Zionist arguments in favor of increased colonization under the British Mandate, as Hope Simpson explains.

> In many cases, when land was bought by the P.I.C.A. for settlement, they combined with the development of the land for their own settlers similar development for the Arabs who previously occupied the land. All the cases which are now quoted by the Jewish authorities to establish the advantageous effect of Jewish colonisation on the Arabs of the neighbourhood, and which have been brought to notice forcibly and frequently during the course of this enquiry, are cases relating to colonies established by the P.I.C.A., before the Keren-Hayesod came into existence. In fact, the policy of the P.I.C.A. was one of great friendship for the Arab. Not only did they develop the Arab lands simultaneously with their own, when founding their colonies, but they employed the Arab to tend their plantations, cultivate their fields, to pluck their grapes and their oranges. As a general rule the P.I.C.A. colonisation was of unquestionable benefit to the Arabs of the vicinity.[162]

Hope Simpson does not specify what he means by saying that the Jewish settlers developed Arab lands the same as their own, but certainly this included extensive transfers of knowledge and expertise. This was particularly true with settlements such as Rishon LeZion and Petah Tikva, which set an example of thriving, modern viniculture and

---

[159] *"Report for the Year 1906."*
[160] *"Report for the Year 1907."*
[161] *"Report for the Year 1908." "Report for the Year 1909." "Report for the Year 1910."*
[162] Simpson, 50.

citriculture respectively for local agriculturalists.[163] The Shaw Report, written and published at roughly the same time at Hope Simpson, arrives at the same conclusion. "In pre-war days the Jews … brought direct and obvious material benefits to the inhabitants of the area in which they settled."[164]

One of the "cases…quoted by the Jewish authorities" may well have been the Arab village of Zarnuka, near Rehovot (founded 1891). This village was reputed to have acquired modern European machinery with the help and guidance of their Jewish neighbors as well as increased their orange groves and vegetable production thanks to capital gained from land sales.[165] Zarnuka is only one village among many that have prospered and been able to adopt modern agricultural methods through close contact with the Jews.[166] Yet later settlers' attitude towards the Arabs differed dramatically from the earliest comers to Palestine, significantly lessening their positive developmental influence.

Shaw claims that the settlements founded by the Zionist Organization after the installment of the Mandate did not display the same openness to the Arabs. Jewish immigration doubtless still brought significant advantages to Palestine as a whole, but "the direct benefit to individual Arabs, which alone is likely to be appreciated, has been small, almost negligible, by comparison to what it might have been had the pre-war methods of settlement been continued."[167] He is likely referring to the policy of self-labor, which did not allow tenants on J.N.F. lands to employ Arab labor. This would have contributed to poor relations between the two communities as well as minimized the knowledge transfer between the Jewish settlements and the Arabs. The Peel Report is even more explicit,

---

[163] *"Report for the Year 1899." "Report for the Year 1901."*
[164] Shaw, 151.
[165] Revusky, 319.
[166] Ibid. Mead, 30.
[167] Shaw, 153.

explaining how a certain "sense of kinship with the Arabs or at least that fellow-feeling that comes with working side by side" had dissipated even in the older colonies by 1937. There had never been much of it in the minds of more modern, Western-minded Jews.[168] The effect of this change is clear. When Hope Simpson discusses Arab villages' ability to learn from example, he is careful to restrict his description to those near German and older Jewish colonies only.[169] This momentous shift unfortunately presaged the turmoil and strife to come.

The Shaw and Hope Simpson reports came at a critical period in the history of Palestine, when Arab discontent with the Mandate government qua government first manifested itself in earnest. Their conclusions, endorsed by the British government and informed by extensive and unbiased study of the issues on the ground, are the most authoritative available. Their highly pessimistic conclusions ignore other ways in which Jewish immigration helped educate the Palestinian agricultural community writ large. Nevertheless it is clear that the inter-farm transfer of knowledge that many writers believed would revolutionize Palestinian agriculture was a mirage.

In its place, the Mandate government implemented a variety of programs to educate the rural population on the benefits of modern farming. Soon after the establishment of civilian governance the British initiated successful demonstrations of tobacco culture in a number of villages, which generated a large demand for seed and technical assistance.[170] The first of many agricultural extension stations was built in Acre, Department of Agriculture staff were dispatched to tour the country, sharing information and reporting on local conditions, agricultural shows were organized, informative leaflets in Arabic were

---

[168] Peel, 119.
[169] Simpson, 89-90.
[170] *Report on the Palestine Administration*, 1922.

distributed and discussed by the extension officers on tour.[171] Working with local communities, the Department brought model beekeeping and poultry installations to Gaza, Nazareth and Nablus where demonstrations were done and modern hives and coops distributed.[172]

By the early 1930s these policies were beginning to bear fruit. At the same time that the British were working to break the debt and poverty cycle of the fellahin, the League of Nations reports start to contain optimistic pronouncements on progress in the Arab sector. The Department saw increasing "evidence that Arab conservatism in agriculture (was) being broken down," as the volume of inquiries concerning seeds, stock and technical advice rose.[173] The government responded by increasing the number of demonstration gardens throughout Palestine from eighteen to fifty-one in a year, as well as opening a long-planned agricultural school at Tulkarm with fifty-five students.[174] By the next year, an additional 118 demonstration plots had been created, bringing the total to 269, two thirds of them in Arab villages.[175] Attached to local schools, these plots were central to the government's agricultural education efforts.

The use of school gardens as an instrumental part of agricultural modernization meant that British expertise, at least theoretically, could reach into every part of Palestine.[176] Teachers were intended to insert an agricultural bias into their curricula, and the Tulkarm School armed some of them with specific, practical expertise in the area. This system "established a closer touch with the farmer than had previously been the case," and

---

[171] Ibid.
[172] *Report on the Palestine Administration*, 1923.
[173] *Report on the Palestine Administration*, 1931. 6.
[174] *Report on the Palestine Administration*, 1931. 154-6.
[175] *Report on the Palestine Administration*, 1932. 179.
Report on the Palestine Administration, 1936. 52.
[176] Simpson, 77.

teachers often addressed lessons to parents as well as students.[177] Sericulture, beekeeping, vegetable gardens and poultry houses, all key focuses of the school garden program, spread widely through the Arab parts of Palestine, as did improved forestry methods and non-cereal crops such as olives, fruit, citrus, and table grape vines.[178]

Yet Department of Education was still inadequate to the challenge. Underfunded, it could not run nearly enough schools to serve every Arab community, severely undermining most fellahin's ability to benefit from the agricultural education being offered.[179] There were only so many Tulkarm-trained teachers, and the rest were often largely ignorant of agriculture and relied on the Department of Agriculture's roving inspectors for information.[180] Considering the disparity in both funding and population size between the Yishuv and the Arabs, Hope Simpson's estimate that "a score of large agricultural schools would have to be provided" to equalize the gulf in opportunity seems reasonable.[181] The impressive spread of apiaries, poultry houses and other more lucrative practices, resulting from so inadequate an educational infrastructure, hints at the enormous possibilities a better-funded department may have been able to bring to light.

Jewish settlers, meanwhile, continued to work towards enlightening Palestinian farmers despite the limits imposed by their own labor policies. The American Fruit Growers of Palestine launched a demonstration that, according to the British, "can hardly fail to promote the general adoption of modern methods of grading and packing."[182]

---

[177] *Report on the Palestine Administration*, 1938. 274. Antebi to Director of Agriculture, 4 Aug. 1933: ISA/Gp7/Ag/22/19/Box638. Cited in El-Eini, 103.
[178] El-Eini, 103. Adams et al., 38. Erskine, 99. *A Survey of Palestine*, 345.
[179] Simpson, 79-80.
[180] Simpson, 81. M.T. Dawe, Director of Agriculture, to Director of Education, 18 Aug. 1933: ISA/Gp7/Ag/22/19/Box 638. Cited in El-Eini, 103.
[181] Simpson, 81.
[182] *Report on the Palestine Administration*, 1921.

Despite its optimism, the report provides no details to explain why the demonstration should be successful.

The Zionist organizations and the Mikveh School partnered for extensive crop research, including in the viability of numerous new oil-crops such as groundnuts, linseed, castor, sunflower and rapeseed. The writer demonstrates a poor knowledge of Palestinian agriculture, however, by claiming that sesame is a new introduction when in fact it had been grown in the region for centuries.[183] Therefore the extent to which these successful experiments were put in place is unclear, but none became fixtures in reports of agricultural yields or exports. The government evidently viewed this research work, done exclusively by Jews, as very important to both Arab and Jewish agriculturalists, and in some instances distributed it widely through leaflets.[184] Research was particularly important for the orange industry, both Jewish and Arab.[185] On the crowded coastal plain, the Jewish example also exerted a positive influence on Arab cultivation.[186] The average Arab cultivator, without anything resembling the capital resources of the average Jewish settlement, could hardly imitate the scientific methods of the Jews.

Needless to say the research work done by the Zionist Executive and the JCA was easily disseminated to Jewish settlements. The settlers, however, often found the advice emanating from their own Extension Department in Tel Aviv to be too scientific and divorced from the practical realities faced by farmers.[187] To the less educated fellahin it would have been ever more incomprehensible. The Jewish colonization societies were now training many of the settlers before their arrival in Palestine, but inadequately, and they had

---

[183] *Report on the Palestine Administration*, 1922.
[184] *Report on the Palestine Administration*, 1925. *A Survey of Palestine*. 344. Simpson, 74.
[185] Simpson, 92. Revusky, 45.
[186] Peel, 129.
[187] Campbell, 446.

much to learn once they took jobs on farms or kibbutzim.[188] Jewish agriculture, founded on modern lines, showed no signs of slowing down its progress.

The Arab's more tepid and fragile approach to modernity was severely disrupted by the Arab Uprising of 1936-39. The Tulkarm School closed, several agricultural extensions stations were damaged or totally destroyed and bandits often derailed their operations.[189] Departmental officers were still welcomed in villages, but the risk of travel was often too great. Whole areas of the countryside became functionally off-limits to the British.[190] Combined with the collapse of the co-operative societies, government efforts to promote agricultural reform took years to recover. By then, World War II and the turmoil leading up to Israeli independence made any further progress very difficult to implement.

Overall, it is clear that education and knowledge transfer played a vital role in the development of Palestinian agriculture for both Jewish and Arab cultivators. As Arab farmers increasingly began to reduce their debts and access credit at fair interest rates, education and access to agricultural promotion infrastructure enabled to make material improvements to their farms. Public education facilities, focusing on agriculture, were unique in the history of Palestine up to that time. While their impact was much less than it could have been due to funding issues and the rioting of the last 1930s, it still represented the first significant improvement in the economy of the fellahin in hundreds of years. Jewish settlers also contributed materially to the improvement of general agricultural practices, particularly through research and by setting an example of the possibilities of modern methods. Yet Jewish agriculture was often sealed off from its neighbor under the

---

[188] Simpson, 42. *Report on the Palestine Administration*, 1925. Campbell, 459-460.
[189] Department of Agriculture and Fisheries Annual Report for the Year 1938-1939. Rep. Jerusalem: Government Printing, 1939. 18. *Report on the Palestine Administration*, 1937. 267.
[190] Department of Agriculture and Fisheries Annual Report for the Year 1938-1939. Rep. Jerusalem: Government Printing, 1939. 16.

Mandate, with few Arabs employed in self-contained, all-Jewish colonies. The communities diverged, particularly after the Balfour Declaration and the Arabs harsh reaction to it. The thriving inter-community relations that prevailed before World War I gradually faded away under the British Mandate, replaced by the mistrust and bitterness that persist to the present day.

H2d: The Zionist ideology of Jewish immigrants was critical to productivity growth in Palestine overall.

While capital and education are the factors most commonly cited by Zionist writers to explain how immigration helped the Arabs, the power of ideology is seen as the foundation of the Jews' own successes in Eretz Israel. Official British reports admittedly do not deeply engage with this issue, but as it is so prevalent in the Zionist narrative and mythology it is certainly worth touching upon. British reports, particularly the major ones, do deal with the nature of ideology in Jewish farms to a certain extent and, combined with the observations of other writers, present a comprehensive picture of how political and religious motivation directly impacted Palestinian agriculture.

The first and most important contribution is self-evident. Without the religio-political Zionist ideology, few Jews would have immigrated to Palestine and even fewer would have chosen life as an agriculturalist. Any positive impact that the Jews brought to Palestine could therefore be ascribed to ideology. Yet Zionist writers clearly either imply or state clearly that the Jews' determination to "redeem" the soil and the tenacity born from their convictions enabled the settlements of the New Yishuv to thrive. This is self-evidently true. Establishing a large national group in a land populated by unsympathetic natives was an arduous task, all the more so since most Jewish settlers were shopkeepers or

businessmen in Europe before making Aliyah. The difficulties they encountered were legion, and their relentlessly positive and motivated spirit, often commented on by visitors to the settlements, was vital.[191] It would be spurious and insincere to diminish their amazing accomplishments.

This thesis, however, seeks to explain the process by which Jewish farmers invigorated agricultural production in Palestine as a whole, not only the plots that they tilled. The progress that they brought to their own farms is also evident.[192] Therefore this section will address whether Zionist ideologies in their myriad manifestations contributed significantly to Palestine's agricultural development once the Jews were already established in what would become the land of Israel.

Zionist ideology's material impact began in the Jewish settlers' willingness to address the environmental challenges of Palestine in new ways. For example, when faced with land where malaria was rampant the settlers of Hadera, rather than leave, drained the swamps breeding the mosquitoes. Ben Gurion sees this as a testament to "the new spirit" of the community's founders.[193] The extensive tree-planting programs of the Zionist Executive and later the Jewish Agency are also commonly cited as example of the Jews' care for the land. The many concrete benefits that trees could bring to a denuded landscape such as Palestine were well known to the Jewish settlers, but undoubtedly ideology also contributed to their strong desire to plant forests. Their efforts, strengthened and complemented by the Mandate government, dwarfed similar reforestation drives piloted by

---

[191] See for example, Samuel 36., or Ruppin, Arthur. "The Return of the Jews to Agriculture." *Zionist Work in Palestine*. Ed. Israel Cohen. New York: Judean, 1912. N. pag. *Hathi Trust*. Web. 25 Feb. 2016.
[192] Mead, 31.
[193] Ben Gurion, 278.

the Supreme Muslim Council.[194] The Jewish Agency cooperated eagerly with the government in not only reforestation efforts but also in draining malarial swamps.[195] The redemption of the land was clearly a major goal of the New Yishuv.

The youthful, hard-working immigrants of the Second Aliyah established character of the Zionist Labor movement, and later the State of Israel. At the time of their arrival, most settlements employed largely Arab workers, who demanded lower wages and were more used to hard agricultural work. Ideologically, this was a calamity. Ahad Ha'am believed that the prioritization of economic interests "washed everything away: love of labor and the ability to work, national idealism and a sense of human self-respect."[196] The men and women of the Second Aliyah instead demanded purely Zionist communities.

The new immigrants would go on to found a group of kibbutzim and moshavot where Jews and Jews alone would fill all roles.[197] As has been already shown, this model became the dominant one among newly settled Jewish colonies.[198] It soon grew to severely limit Arab-Jewish commercial interaction as well.[199] The J.N.F.'s self-labor policy crippled the Jewish settlements' ability to positively impact agricultural development outside their own boundaries. Beginning during the Second Aliyah, the policy's effects reverberated throughout the history of the British Mandate, as Hope Simpson explains:

> It ceases to be land from which the Arab can gain any advantage either now or at any time in the future. Not only can he never hope to lease or to cultivate it, but, by the stringent provisions of the lease of the Jewish National Fund, he is deprived for ever from employment on that land. Nor can anyone help him by purchasing the land and restoring it to common use. The land is in mort-main and inalienable. It is for this reason that Arabs

---

[194] *Report on the Palestine Administration*, 1923, 1924.
[195] *Report on the Palestine Administration*, 1934. 28.
[196] Quoted in Ben Gurion, 280.
[197] Ben Gurion, 282.
[198] Empson, C. *Economic Conditions in Palestine*. Rep. London: His Majesty's Stationery Office, 1935. 48. Adams et al, 51.
[199] Erskine, 102.

discount the professions of friendship and good will on the part of the Zionists in view of the policy which the Zionist Organisation deliberately adopted.[200]

The negative effects on inter-community knowledge transfer chronicled in the preceding section can be ascribed entirely to ideology.

The ideological nature of the project being built in Palestine came to have real consequences. The Expert Reports of Dr. Elwood Mead and Sir John Campbell[201] are particularly critical of some aspects of the Jewish approach. Sustained as they was by capital from abroad, the Jews felt the need to excited their co-religionists and benefactors by continuously building new settlements, regardless of the ability to establish them securely.[202] The administration of these colonies was largely controlled through the General Federation of Jewish Labor, also known as the *Histadrut*, and their imposition of political goals on the settlement project materially weakened it.[203] "Several of the leading officials have in the past been more concerned with putting into practice their social and political theories and ideas than with the humdrum business settling Jewish colonists on the soil of Palestine."[204] Ideology prevented them from trusting expert opinion or planning realistically for the future.[205] Campbell even finds some degree of fault with the colonists' unending enthusiasm for hard work, saying that such an attitude causes them to neglect the minutiae of actually building of a sustainable and self-reliant settlement.[206] This critique is harsh; if the colonies did indeed have trouble weaning themselves off of financial assistance (as Hope Simpson also reported), then the fault lies with management rather than

---

[200] Simpson, 54.
[201] An American irrigation expert and an economic advisor to the British Colonial Office, respectively.
[202] Mead, 53.
[203] Ibid.
[204] Campbell, 436.
[205] Ibid.
[206] Campbell, 437.

the enthusiastic worker. Campbell's critique does highlight the potential downside of the self-sacrificial ideology of the early settlers, and complicates the overly worshipful image found in pro-Zionist sources.

Zionist ideology has therefore a complex legacy in regards to promoting agricultural development. This is particularly true for the focus on redeeming the land of Israel using exclusively Jewish labor. Zionist authors are undoubtedly justified in extolling the praises of the determined men and women who embarked on a dangerous and uncertain path and triumphed. In so doing, they indirectly brought the capital, technology and expertise already discussed to Palestine. Their ideological motivations and inclinations, however, directly hindered the development of Palestinian agriculture writ large.

H2e: The rise of communal farming institutions was critical to productivity growth in Palestine overall.

In addition to ideology generally, Zionist writers often extoll the virtues of the communal settlements system, the *kibbutz*. These communities were the epitome of the Second Aliyah immigrants' virtues: hard work, self-reliance, creativity, and commitment to the nationalist project. They were not founded with an eye towards development or economic success, however. This section examines the degree to which their communal nature impacted their success and their impact on their surroundings. Due to the importance of kibbutzim in the Zionist narrative, I rely on non-British sources here more than any other portion of this thesis, but with much valuable insight from official reports included as well.

The first kibbutz, Degania, began in 1910 due to a dispute between the manager of the farm and his workers, who eventually took over the estate themselves, with excellent

results.[207] At the same time, a managed co-operative colony in the Esdraelon Valley was struggling, as it was "apparently not suited to the strongly independent character of Jewish co-operators."[208] The workers there also ultimately rejected the management in favor of establishing a true kibbutz.[209] These unconventional settlements presented several important advantages. Their communal nature proved to be ideal for overcoming some of the most significant challenges faced by the New Yishuv in its earliest years, namely, security, training of new arrivals, and the preparation of land.[210] To Ben Gurion, the early settlers of the kibbutzim are just as praiseworthy as the pioneers of the Second Aliyah. He adds an important note, however, that kibbutzim were wildly successful economically, developing industry as well as highly advanced agricultural techniques.[211] For ideological or practical reasons, kibbutzim were very popular among new arrivals in Palestine, with the system "still in full vigour," and new communities were being established in 1930.[212] They have remained an integral part of the Zionist "making the desert bloom" narrative ever since.

Despite their psychological importance, however, kibbutzim demonstrated many flaws during the Yishuv's consolidation period under British rule. Even wholehearted advocates of the system admit some significant drawbacks, and Mead and Campbell once again level harsh criticisms of communal farms. Revusky, normally thoroughly enthusiastically pro-kibbutz, admits that they, like all Zionist settlements, were heavily dependent on financial assistance. The collective system, however, was less efficient,

---

[207] Ben Gurion, 284.
[208] Revusky, 17.
[209] Ben Gurion, 288.
[210] Revusky, 126.
[211] Ben Gurion, 285.
[212] Simpson, 46.

innovative and profitable than the same land area might have been under private ownership, therefore slowing the march towards self-sufficiency and repayment of debts.[213] In some communities, farmers who made extra effort or tried new approaches were criticized as detrimental to the unity and egalitarian nature of the kibbutz.[214] Once weaned off of outside funding, up to a third of kibbutzim revenue had to come from non-agricultural pursuits to make up for the inefficiencies of the communal system.[215] While the kibbutz as an institution remains important in Israel to this day, communal farms covered only a limited percentage of Jewish-owned land, which was itself only a subset of total farmland. Prior to independence, for example, kibbutzim owned only 12,000 dunums of citrus compared to 108,000 dunums in more individualistic settlements.[216] Their limited economic system prevented them expanding any further.

The popularity of kibbutzim that Hope Simpson refers to therefore sprung more from ideological sources than economic efficiency. Revusky implies that they relied on the ideological willingness for self-sacrifice and hard work in order to avoid the fate of similar collective experiments elsewhere in the world.[217] Campbell forcefully echoes this assessment, saying that kibbutzim were mostly populated by "youthful enthusiasts, full of theory, and possessing a plentiful lack of knowledge of life."[218] His predictions of the imminent demise of the communal system are certainly overwrought, and likely influenced by his perspective as a traditional British capitalist. This does not mean that his other

---

[213] Yitzhak Wilkansky. *The Collective Agricultural Settlements in Palestine (1927)*. 1927. *The Origins of Israel, 1882-1948: A Documentary History*. Madison: U of Wisconsin, 2011. 105. Mead, 58.
[214] Mead, 51.
[215] A Survey of Palestine, 384.
[216] A Survey of Palestine, 374.
[217] Revusky, 133.
[218] Campbell, 444.

conclusions are tainted, however, since they are mostly based on direct observation and echoed by some supporters of kibbutzim. Campbell was unable to understand the appeal they held for young Zionists, but his expertise on economic questions remains unchallenged. It is more likely that unquestioned advocates of the kibbutz system were too quick to praise the farms as economic successes without attempting to understand if alternative approaches would be better.

The kibbutzim were therefore successful largely thanks to the draw of their unique ideological configuration rather than their economic success, especially compared to other, more traditional Jewish settlements. Despite their highly advanced agricultural techniques, there is no evidence that kibbutzim were a uniquely significant source of innovation, and significant evidence that the opposite was true. So far as the agricultural development of Palestine is concerned, therefore, kibbutzim were unimportant and may have in fact been a net negative.

H2f: The rise of plantation-style farms was critical to productivity growth in Palestine overall.

The question of plantation-style farms is an important one. Unfortunately, the literature (even within British reports) has no consensus on what features qualify a "plantation" in Palestine. The easy assumption would be that Rothschild-style monoculture farms are typical, which is true, but many other sources discuss plantations of fruit, tobacco, wheat etc. even under the British Mandate. While most sources are dismissive of the Rothschild farms, many of them did survive long after their transition and have become important towns in Israel today. Merely evaluating these plantations while ignoring later farms that may or may not have had similar characteristics would not truly prove or

disprove the hypothesis. Finding a firm conclusion would require an in-depth exploration of various archives that is beyond the scope of this thesis. While the question of plantation-style farms remains important for understanding the process by which Palestinian agriculture developed in the modern period it unfortunately cannot be answered here.

Summary

My use of document analysis in this chapter has demonstrated the complex nature of agricultural development in Palestine. Each factor could be examined in a vacuum and shown to be of enormous benefit to agriculture, but this would be misleading. By searching to understand how the policies of the British Mandate and the Zionists contributed to their promotion, this chapter has demonstrated that the Jewish settlers in many ways failed to extend their development and innovative practices to farmers in the rest of the country.

The joint uptick in production and Jewish population around 1930 that Chapter 4 showed was a mirage. It was not Jewish immigration that led to this increase but the British reaction to the harshly self-critical Shaw and Hope Simpson Reports. The rural credit and agricultural education policies put in place in the early 1930s clearly made an impact on farmers, particularly for the fellahin who made up the vast majority.

Some may question giving credit for this development to the British government after analyzing primarily British documents. But it should be noted that Zionist sources rarely if ever disagree with the government's version of events. Only the British sources provide a clear mechanism by which agricultural production in Palestine was increased

rather than simply presupposing the Jews' vital role. What evidence there is for a strong Jewish responsibility for educating and assisting the peasantry belongs to the limited pool of non-J.N.F. settlements.

Chapter 6: Conclusion

This thesis has presented a thorough examination of one of the founding myths of the State of Israel, namely that Jewish settlers found a desert in Palestine and made it bloom. I have sought to show the ways in which Jewish immigration interacted with the changing agricultural landscape of Palestine between 1880 and 1948, particularly in light of the vast differences between the administrative regimes of the Ottoman Empire and the British Mandate. I hope that my conclusions will prove illuminating to those on both sides of this divisive issue and will help policymakers and individuals understand how the Israel-Palestine conflict came about and, hopefully, what can be done to resolve it.

The "making the desert bloom" myth, until now almost entirely unexplored, is central to Israeli, Palestinian, and outside perceptions of Israel. These in turn shape political dialogue in important ways. Faced with persistent questions about the young country's "right to exist," Israelis and their supporters have found comfort and justification in a historical claim to ownership and stewardship of the land that does not lie in the distant past. Palestinians and their advocates, meanwhile, have often angrily rejected the notion that the development that the Jews brought to Palestine gives them a right to the land if indeed they brought development at all. The truth, as is the case for most divisive issues in international relations, lies somewhere in the middle.

This thesis sought to answer two research questions. First, *did Zionist settlers in Palestine really "make the desert bloom"*? Second, w*hat were the primary factors behind agricultural and ecological changes in Palestine in the years 1880-1948*?

My first research section examined agricultural returns during the Ottoman period, using export trade as a proxy to determine whether productivity rose significantly between 1880 and 1948 and how closely these changes correlated with Jewish immigration. The data is admittedly imperfect, but provides important context for understanding the process of agricultural development. The most significant finding is that Jewish immigration and total production are almost entirely decoupled and unrelated for every crop except oranges. While data that showed them to be closely correlated would not have proven causation, the fact that increasing Jewish presence did not coincide with increases in most crops is difficult to reconcile with the myth.

There was an increase in production under the British Mandate that began around the year 1930, at the same time as Palestine saw a notable increase in the Jewish population. This was particularly evident for olives, melons, wheat, and barley, all of which were primarily Arab-grown crops. Therefore it remains possible that the higher Jewish population facilitated that growth. Correlation does not mean causation, however, and a more thorough examination of the causes shows that the myth fails to adequately explain the trajectory of Palestinian agriculture.

Research Section 2 demonstrates the process by which the production gains shown in Section 1 were made possible. My first hypothesis deals with funding and capital. This factor was overwhelmingly important in allowing improved agricultural production. The great majority of yield improvement undertaken in Palestine were very expensive and out of reach for most farmers, particularly Arabs. Jewish capital funded significant innovations and improvements in agriculture in the settlements. Arab landowners, in turn, used the money gained by selling land to the Jewish National Fund to invest in their own farms,

especially oranges. Therefore the increase in oranges shown in Chapter 4 was truly dependent on Jewish immigration, even though roughly half of the groves planted were Arab-owned. The fellahin, however, saw very little of this money. They were instead reliant on the Mandate government to help break the cycle of poverty and debt and make capital available to them at fair interest rates. The financial programs begun in the early 1930s after the publication of the Shaw and Hope Simpson Reports marked a new day for poor farmers. Although it was severely weakened by the riots of 1936 and changing British priorities during World War II, the positive effects of this program are clear in the documents analyzed as well as in the trend line of production growth shown in Chapter 4.

My second hypothesis concerns modern agricultural technology, encompassing both machinery and improved plant varieties and animal breeds. These also have had a significant effect on Palestinian productivity. Both machines and high-yield European seeds were made available to farmers through the Mandate government's agricultural stations. They did not affect a transformation overnight, but were increasingly common and economically significant in Palestinian villages in the late 1930s. This was especially true for the cheapest and simplest modern methods such as beekeeping, poultry raising and sericulture.

My third hypothesis examines the role of education and expert advice in Palestine. The Jews built an impressive series of research stations that produced new and useful findings, particularly for the orange sector. Their contributions are undeniable and significant. But once again they remained out of reach of the majority of the agricultural population of Palestine. The policy changes put in place by the J.N.F. reduced close interaction between Jews and Arabs in the agricultural colonies, thereby preventing the

interchange of knowledge and skills. Most Zionist evidence otherwise comes from pre-J.N.F. settlements, as Hope Simpson points out, which were a small minority of the total. The Mandate government was left to fill the gap, which they did with primary education, touring agricultural officers, demonstrations and information distribution. These efforts were largely inadequate to the enormous task at hand, and the degree to which they meaningfully impact Palestinian agriculture is unclear. It is certain, however, that they had greater impact than the Zionists in this respect.

My fourth hypothesis measures the influence of ideology. While ideology motivated the Jewish settlers to come to Palestine in the first place, it was not itself a powerful factor in the progress of the whole country. The willingness to work and eagerness to care for the soil served the Jews well when farming their own land. But it led to restrictive policies that emphasized self-labor and shut the Arab out of the rural Jewish economy. This in turn prevented the transfer of both skills and money to the impoverished fellahin. Ideology also encouraged over-reliance on manual labor and political projects rather than building a sustainable, self-reliant rural Yishuv. These ideologies were central to the building of the Jewish state, and likely delayed self-sufficiency little if at all, but they did serious harm to the agricultural development of Palestine as a whole.

My fifth hypothesis addresses the unique Israeli communal agriculture system – the kibbutz. These were the epicenters of the Zionist ideology discussed in the previous paragraph, and recreated all of its advantages and flaws. They were ideal for the difficult and often dangerous work of founding a new settlement, and their communistic social structure ensured a strong and united community. They were also very popular with newcomers. Their socialist practices, however, discouraged the very things that made

Jewish settlement in Palestine strong and productive – innovation, risk-taking, going the extra mile. Although successful and sustainable, kibbutzim could not by their nature or inclination spread techniques and assistance to their neighbors in order to improve their development.

The findings presented here are well grounded in archival evidence and secondary literature. Still they could be improved through the investigation of more hypotheses that might explain how Palestinian agriculture developed or by the use of other sources, particularly the Israeli State Archives and more Arab primary sources. This thesis also has nothing to say on the remarkable work that Israel has accomplished in the realm of agriculture since their independence. But that was not the goal, and that is not the core of the myth. I have shed light on the truth behind Israeli national myths. Hopefully this will allow both sides of the Israel-Palestine conflict to base their arguments in historical fact rather than legend.

Jewish agriculture in Palestine was and remains an impressive achievement as well as a vital building block in the foundation of a strong, independent State of Israel. Yet the common claim that Jewish settlers "made the desert bloom" is, at best, extremely incomplete. The Zionists made their own parcels bloom and flourish like few others before or since, but the country as a whole was only barely the better for it. It appears that the Zionist narrative relies almost entirely on the orange crop, which was an important part of Palestinian agriculture but ignores most of the territory and production, including all "desert" land. Segregated by self-labor policies and self-governing institutions, the Jews and Arabs did not build a vibrant interchange of ideas and knowledge, particularly in

agriculture. Such separation did a great disservice to the twin causes of peace and economic development.

When Prime Minister Levi Eshkol spoke the words that introduce this thesis, he was undoubtedly sincere. When he had come to Eretz Israel it was indeed severely underdeveloped. He and his fellow settlers accomplished amazing things in building a prosperous and democratic New Yishuv. Unfortunately, their own dramatic successes blinded them to the poverty and underdevelopment that remained endemic outside the orange-producing coastal plain. That same blindness now maintains the myth that Jewish settlers "made the desert bloom" while the Arabs willingly let it remain a wasteland. The early Zionists insisted that their political project would uplift and assist the Arabs as much as the Jews. Unfortunately, they were wrong.

Appendix A – Archival Crop Data

Orange Exports

Year	Exports (£, 000)	Exports (cases, 000)	Year	Exports (£, 000)	Exports (cases, 000)
1870			1906	162	547.7
1871		148	1907	179.18	630
1872			1908	168.94	675.93
1873	36	205.6	1909	185.81	744.46
1874		188.9	1910	235.6	853.77
1875	11.95	75.5	1911	200.5	869.8
1876	17.364	103.7	1912	283	1418
1877	9.32	105.2	1913	298	1608.57
1878			1914		
1879	26.25	194.4	1915		
1880	58	145	1916		
1881	50.52	170.5	1917		
1882	60.3	116.3	1918		
1883	16.6	75	1919		
1884	17.2	78.9	1920	200.47	830.96
1885	26.5	106	1921		983.39
1886	29.4	98	1922	325.37	1238.9
1887	36	180	1923	415.4	1365.54
1888	55	221	1924	420.49	1589.3
1889	51.2	205	1925	511.6	1868.29
1890	83.12	200	1926	825	2658.7
1891	108.4	270	1927		
1892	62	248	1928		
1893	69.5	178	1929	516.62	1722.08
1894	51	280	1930	721.576	2405.09
1895	65	260	1931	886.35	2616.45
1896	72.6	242	1932	1701	3524.6
1897	75.8	290	1933	1949.177	4360
1898	82.5	330	1934	2572.6	5129.422
1899	77	310	1935	3550.73	6878.91
1900	74.21	251.07	1936	2853.95	6524.59
1901	86.52	361.45	1937	4329.7	9166.9
1902	86.5	304.09	1938	3781	9765.16
1903	93.43	447.67	1939		13055.4
1904	103.95	467.5	1940		
1905	114.65	456.15	1941		

Wheat Exports

Year	Exports (£, 000)	Exports (kg, 000)	Year	Exports (£, 000)	Exports (kg, 000)
1870			1906		
1871			1907		
1872			1908	4.2	507
1873	60	310	1909		
1874		212	1910		
1875	70	448	1911		
1876	70	430	1912		
1877			1913		
1878			1914		
1879			1915		
1880	42.11	189.5	1916		
1881	81.35	440	1917		
1882	73.3	482.9	1918		
1883	13.9	94.5	1919		
1884	14.56	110	1920	64.53	1819.74
1885	3.6	489.9	1921		
1886	3.32	413.67	1922		5880.88
1887	15	2721.55	1923		3162.95
1888	7.8	1360.78	1924		
1889	16.95	3076.44	1925		
1890	19.92	4528.66	1926		
1891	3.3	587.85	1927		
1892			1928		
1893			1929		
1894			1930		
1895	3.56	1082.1	1931		
1896	1.92	237.3	1932		
1897			1933	0.827	
1898	14	2177.24	1934	1.857	
1899			1935	1	
1900			1936	0.057	
1901			1937	9.752	
1902			1938	0.05	
1903			1939		
1904			1940		
1905	11	1667.77	1941		

Wheat Production

Year	Production (metric tons, 000)
1919	63
1920	
1921	72.9
1922	87.15
1923	88.36
1924	92.3
1925	
1926	
1927	99.4
1928	65.3
1929	87.87
1930	87.34
1931	79.65
1932	51.1
1933	44.45
1934	82.85
1935	104.35
1936	76.06
1937	127.4
1938	44.43
1939	89.19
1940	136.08
1941	90.36
1942	104.39

Maize Exports

Year	Exports (£, 000)	Exports (kg, 000)	Exports (Imperial Quarters)
1870			
1871			
1872			
1873			
1874			
1875	7.4	70.5	8812
1876	7.13	80	10000
1877	4.24	16	2000
1878			
1879			
1880	3.18	23.3	2980
1881	9.78	80	9412
1882	16.9	143.3	16860
1883	15.4	149.5	17587
1884	8.6	90	10588
1885	7.87	59.925	7050
1886	9	76.5	9000
1887	21	204	24000
1888	16.96	180.2	21200
1889	18.2	193.38	22,750.00
1890	11.24	148.55	17,476.00
1891	17.3	155.76	18,325.00
1892	0.42	5.91	695.00
1893	2.58	27.591	3,246.00
1894	2	20.026	2,356.00
1895	3.2	40.17	4,726.00
1896	14.17	177.23	20,850.00
1897	8.45	74.38	8,750.00
1898	3	25.5	3,000.00
1899	1.22	25.5	3,000.00
1900	2.95	31.875	3,750.00
1901	0.12	1.02	120.00
1902	1.45	11.05	1,300.00
1903	6.2	66.3	7,800.00
1904			
1905			

Barley Exports

Year	Exports (£, 000)	Exports (kg, 000)	Year	Exports (£, 000)	Exports (kg, 000)
1870			1906		
1871			1907		
1872			1908	0.71	6.25
1873	16.5	120	1909	0.18	1.48
1874		228	1910		
1875	24.7	25	1911		
1876	2.32		1912	1.25	9
1877			1913	3.4	30.6
1878			1914		
1879		100.5	1915		
1880	5.97	255	1916		
1881	23.61	18.27	1917		
1882	1.62		1918		
1883			1919		
1884			1920	33.29	2149.856
1885		1.98	1921		18777.712
1886	0.16	19.8	1922		7247.128
1887	1.76		1923		73.152
1888		3	1924		
1889	0.29		1925		
1890			1926		
1891			1927		
1892			1928		
1893			1929	26.55	3714.496
1894		5.85	1930	55.75	18132.552
1895	0.26	9	1931		
1896	0.635		1932		
1897			1933	0.57	
1898			1934	19.27	3881.12
1899			1935	0.421	
1900			1936	0.001	
1901			1937	56.65	
1902			1938	1.89	
1903			1939		
1904			1940		
1905			1941		

Barley Production

Year	Production (metric tons, 000)
1919	27
1920	
1921	61.33
1922	35.4
1923	27.16
1924	32.2
1925	
1926	
1927	44.52
1928	46.7
1929	46.24
1930	60.1
1931	41.2
1932	24.3
1933	33.93
1934	68.71
1935	68.9
1936	55.17
1937	75.41
1938	66.73
1939	86.23
1940	102.54
1941	68.84
1942	114.52

Sesame Exports

Year	Exports (£, 000)	Exports (kg, 000)	Year	Exports (£, 000)	Exports (kg, 000)
1870			1906	60	426.74
1871			1907	47.32	2358.22884
1872			1908	54.74	2214.9672
1873	65.45	3840	1909	50.48	2763.6288
1874	47.35	2560	1910	37.23	1940.6364
1875	54.6	3584	1911	98	4876.992
1876	50.4	3008.512	1912	30.16	1524.06
1877	46.04	2393.6	1913	31.3	1554.5412
1878			1914		
1879	24.4	1408	1915		
1880	37.78	2176	1916		
1881	29.93	1817.6	1917		
1882	44.6	2934.784	1918		
1883	9.2	640	1919		
1884	37.1	2329.6	1920		
1885	32	2438.52	1921		519.20155
1886	45.53	3149.755	1922		1499.6898
1887	42.5	2154.026	1923		1187.76245
1888	28.12	1900.0135	1924		
1889	62.66	4389.336	1925		
1890	109.32	7376.523	1926		
1891	30.8	1920.3345	1927		
1892	69.35	5080.25	1928		
1893	52.94	4064.2	1929	72.325	3596.817
1894	42.15	4186.126	1930	36.22	2763.656
1895	42.75	3749.2245	1931	12.53	914.445
1896	59.8	4673.83	1932	6.5	365.778
1897	40	3170.076	1933	2.87	
1898	28	2032.1	1934	8.45	
1899	21	1524.075	1935	16.83	
1900	30.56	2336.915	1936	4.87	
1901	25.2	1737.4455	1937	28.32	
1902	29.26	6502.72	1938	23.31	
1903	30.04	2194.668	1939		
1904	23.35	1696.8035	1940		
1905	13.82	995.729	1941		

Sesame Production

Year	Production (metric tons, 000)
1919	1
1920	2.5
1921	3
1922	3.4
1923	3.6
1924	2.1
1925	
1926	
1927	5.83
1928	1.98
1929	4.17
1930	2.36
1931	2.02
1932	0.45
1933	0.21
1934	2.63
1935	6.91
1936	1.85
1937	9.32
1938	6.44
1939	3.75
1940	6.62
1941	7.47
1942	6.21
1943	
1944	
1945	4.726

Olive Oil Exports

Year	Exports (£, 000)	Exports (kg, 000)	Year	Exports (£, 000)	Exports (kg, 000)
1870			1906		
1871		256	1907		
1872			1908	0.275	8.128
1873	23.44	815.63	1909	7.952	307.11
1874		166.4	1910	6.68	302.37
1875	39	1280	1911	14.98	362.73
1876	189.92	4480	1912	4	70.1
1877	41.67	1280	1913	6.27	99.57
1878			1914		
1879	74.07	2560	1915		
1880	29.63	1024	1916		
1881	6.53	204.8	1917		
1882	15	519.8	1918		
1883	21.15	1024	1919		
1884	11.9	460	1920		
1885	25.26	916.82	1921		
1886			1922		
1887	7.55	274.42	1923		
1888	20.62	686.06	1924		
1889	26.43	931.04	1925	6.87	
1890	75.08	2638.66	1926	9.23	
1891	20.7	693.54	1927	68.47	
1892	1.35	5	1928	12.53	
1893	13.84	525.8	1929	7.736	166.63
1894	9.05	291.68	1930	19.394	528.34
1895	2.6	129.72	1931	29.227	
1896	6.05	187.99	1932	32.414	
1897	3.5	113.4	1933	20.786	
1898	4.5	149.7	1934	18.687	
1899	1.35	36.85	1935	32.787	
1900	9.11	271.25	1936	26.2	
1901	1.5	43.54	1937	91.07	
1902			1938	77.73	
1903	5.33	188.01	1939		
1904	0.95	36.7	1940		
1905			1941		

Soap Exports

Year	Exports (£, 000)	Exports (kg, 000)	Year	Exports (£, 000)	Exports (kg, 000)
1870			1906	100	3870.96
1871		406.418	1907	88.87	3215.64
1872			1908	141.38	4583.176
1873	63.11	2221.44	1909	50.48	3727.704
1874			1910	37.23	4177.792
1875	42.97	1664	1911	144.3	4450.08
1876	85.5	314.88	1912	254	7914.64
1877	8.33	281.6	1913	200	6350
1878		0	1914		
1879	55	1728	1915		
1880	56.46	1856	1916		
1881	37.78	1088	1917		
1882	45.8	1438.72	1918		
1883	21.9	844.8	1919		
1884	13.3	486.4	1920	132.17	1498.6
1885	13.7	437.896	1921		3654.552
1886	8.96	284.48	1922	148	3126.232
1887	38.4	1219.2	1923	215.85	4874.768
1888	45	1524	1924	203.89	4885.944
1889	33.6	1066.8	1925	247.72	5948.68
1890	44.7	1440.688	1926	175.07	
1891	124	4318	1927	234.08	
1892	46.8	1828.8	1928	224.5	
1893	112	3962.4	1929	214.135	5184.648
1894	114	4064	1930	204.876	6040.12
1895	93.25	4511.04	1931	119.94	1885.696
1896	113.1	4996.688	1932	108.1	3655.568
1897	75.8	3200.4	1933	79.342	
1898	62	2794	1934	71.53	
1899	125.75	5334	1935	79.31	
1900	44.5	1661.16	1936	53.8	
1901	57	2245.36	1937	76.29	
1902	18.76	754.888	1938	68.53	
1903	77.54	2854.96	1939		
1904	62	2685.288	1940		
1905	56.9	2311.4	1941		

Olives and Olive Oil Production

Year	Olives (metric tons, 000)	Olive Oil (metric tons, 000)
1919		0.37
1920		6.7
1921	0.6	0.594
1922	3.755	3.297
1923	1.12	2.983
1924	3.86	4.9
1925	1.27	2.69
1926	2.1	4.3
1927	20.55	
1928	2.63	
1929	15.5	
1930	2.99	
1931	33.91	
1932	6.56	
1933	3.6	0.72
1934	6.65	1.33
1935	45.09	8.8
1936	15.75	2.788
1937	47.25	
1938	38.57	
1939	35.28	
1940	45.77	
1941	13.47	10.5
1942	62.71	1.62
1943		9.4
1944		9.91
1945	79.47	2.74

Melon/Colocynth Exports

Year	Melons (£, 000)	Melons (kg, 000)
1875	0.74	8.7318
1876	0.79	22.4532
1877	0.69	16.492896
1878		
1879	1.67	18.711
1880	2.67	29.9376
1881	1.56	18.711
1882	0.645	10.850112
1883	0.251	4.9896
1884	0.992	18.711
1885	0.8	12.474
1886	2.15	27.4428
1887	1.6	12.474
1888	2	27.216
1889	1.8	21.95424
1890	2.2	22.4532
1891	3.8	42.36624
1892	2.58	40.23432
1893	0.95	19.0512
1894	0.8	7.4844
1895	1.4	8.43696
1896	2.5	15.10488
1897	1	19.9584
1898	1.4	19.278
1899	1.3	17.4636
1900	1.9	20.6388
1901	2.2	15.73992
1902	1.4	11.06784
1903	3.7	32.278176
1904	3.65	25.8552
1905	3.37	23.814
1906	6	57.3804
1907	5	39.231864
1908	4.5	34.4736
1909	2.55	18.452448
1910	3.47	36.705312
1911	6.52	65.772
1912	4	99.792

Watermelon Exports

Year	Exports (£, 000)	Year	Exports (£, 000)
1897	26	1919	
1898	24.85	1920	
1899	26.1	1921	
1900	24.5	1922	
1901	21.7	1923	131
1902	17.6	1924	102.15
1903	19	1925	124.22
1904	11	1926	
1905	18.8	1927	
1906	21	1928	
1907	16.15	1929	101.736
1908	22.1	1930	83.625
1909	31.53	1931	47.72
1910	37.249	1932	30.79
1911	42	1933	20.54
1912	25	1934	30
1913	34	1935	30.87
1914		1936	20.14
1915		1937	16.06
1916		1938	17.115
1917		1939	
1918		1940	

Watermelon Production

Year	Production (metric tons, 000)
1919	2.4
1920	16.3
1921	18.3
1922	20.21
1923	21.15
1924	25.26
1925	30.05
1926	25.04
1927	37.93
1928	15.58
1929	16.3
1930	14.84
1931	22.06
1932	32.12
1933	20.43
1934	40.51
1935	68.8
1936	81.33
1937	102.86
1938	114.8
1939	86.89
1940	107.83
1941	77.91
1942	64.7
1943	
1944	
1945	142.83

Wine and Spirits Exports

Year	Exports (£, 000)	Exports (kg, 000)	Year	Exports (£, 000)	Exports (kg, 000)
1897	4.34		1919		
1898	20.5		1920		2671.344
1899	2.9	366	1921		4230.85
1900	21.84	1365	1922		2833
1901	35.35	2443	1923		2575.26
1902	18.4	1202.79	1924		
1903	30.35	2805.79	1925	46.63	
1904	37.86	3512.58	1926	32.24	
1905	47.02	3708.4	1927	23.75	1126.37
1906	36	1091.9	1928	35.82	
1907	33.85	2703.75	1929	30.5	
1908	42.2	3336.97	1930	34.16	
1909	33.53	2289.16	1931	33.85	1242.12
1910	60.92	3806.52	1932	33.4	1685.47818
1911	77.6		1933	24.476	1150.08
1912	60.4		1934	28.93	1006.32
1913	60.53		1935	21.4	
1914			1936	22.67	
1915			1937	20.32	855.40794
1916			1938	24.65	946.42
1917			1939		
1918			1940		

Wine and Spirit Production

Year	Wine (L, 000)	Arak (L, 000)	Cognac (L, 000)	Other Spirits (L, 000)
1923	21.15			
1924	25.26			
1925	30.05			
1926	25.04			
1927	37.93			
1928	15.58	84.738	137.72	414.837
1929	16.3	66.539	153.21	425.321
1930	14.84	81.762	238.79	371.171
1931	22.06	52.568	147.25	196.8
1932	32.12	52.944	160.72	420.9
1933	20.43	38.31	121.29	586.99
1934	40.51	41.85	203.495	853.68
1935	68.8	51.61	295.54	1012.6
1936	81.33	58.54	187.6	1070.23
1937	102.86	58.98	364.88	948.3
1938	114.8	59.6	173.845	859

Durra/Sorghum Production

Year	Production (m. tons, 000)
1919	15.3
1920	30.4
1921	14.818
1922	23.527
1923	16.103
1924	33.9
1925	30.6
1926	23.7
1927	37.44
1928	32.73
1929	31.44
1930	37.06
1931	16.86
1932	15.45
1933	8.86
1934	42.42
1935	46.13
1936	22.12
1937	61.02
1938	63.25
1939	42.9
1940	58.3
1941	65.49
1942	57.96

Other Crop Production[219]

Year	Beans	Lupins	Peas	Lentils	Almonds	Tobacco	Potatoes	Tomatoes
1919			2100					
1920	2100	1325	3400		200			
1921	4948		2063	4792	436	265		
1922	7275		781	5593	463	694		
1923	6551	2076	1070	4788	470	645		
1924	4511		1286	2930	516	1845.3		
1925	2374		1443	2427	589	678		
1926	2691		1134	3312	302	505		
1927						547		
1928						342		
1929						1194		
1930						954		
1931							821	7978
1932							1108	7471
1933				1500			2500	11201
1934	1489		225	2250			3000	14535
1935				2600			5000	17286
1936				2379	3910	1237	5000	19027
1937				3830			10000	
1938	1529	569		3278			9000	
1939	1325	443		3278	4006	523	10500	36,851
1940				5200			20900	
1941				3100			13500	
1942					3129	1419	22790	55089
1943						1224		
1944	3144		987	7587		1684	32816	
1945					4292	815		60457

[219] All values in metric tons

Appendix B – Population Data

Year	Jewish Pop. (adjusted)[220]	Jewish Population (official)	Year	Jewish Pop. (adjusted)	Jewish Population (official)
1877	13942	13942	1912	51687	35087
1878	14197	14197	1913	53567	36267
1879	14460	14460	1914	55489	37489
1880	14731	14731	1915		
1881	15011	15011	1916		
1882	15633	15300	1917		
1883	16265	15599	1918	58728	
1884	16907	15908	1919		
1885	17560	16228	1920		
1886	18221	16556	1921		
1887	18895	16897	1922		94752
1888	19580	17249	1923		102134
1889	20278	17614	1924		113059
1890	20988	17991	1925		137484
1891	21710	18380	1926		149066
1892	22445	18782	1927		153828
1893	23194	19198	1928		158122
1894	24349	19649	1929		164492
1895	25517	20117	1930		170783
1896	26880	20780	1931		175936
1897	28266	21466	1932		193467
1898	29673	22173	1933		236297
1899	31106	22906	1934		284305
1900	32562	23662	1935		356487
1901	34046	24446	1936		385408
1902	35557	25257	1937		397166
1903	37096	26096	1938		412552
1904	38665	26965	1939		457943
1905	40262	27862	1940		479872
1906	41891	28791	1941		492458
1907	43553	29753	1942		503608
1908	45249	30749	1943		522112
1909	46978	31778	1944		547902
1910	48743	32843	1945		573587
1911	50546	33946	1946		602586

[220] For details on population adjustment procedure, see p. 26.

Bibliography

Archival Sources

A Survey of Palestine. Jerusalem: Printed by the Government Printer, Palestine, 1946. Reprint. Archive Editions, 1995.

Campbell, Sir John. "Report on the Jewish Settlements." *Reports of the Experts Submitted to the Joint Palestine Survey Commission*. Boston, MA: Daniels Printing, Incorporated, 1928. 431-478. *Hathi Trust*. Web. 19 Mar. 2016.

Commercial Relations of the United States with Foreign Countries. Washington: Govt. Printing Office, 1859, 1860, 1873. *Hathi Trust*. Web.

Empson, C. *Economic Conditions in Palestine*. Rep. London: His Majesty's Stationery Office, 1935. Reprint. Archive Editions, 1995.

Foreign Service Annual Series: Diplomatic and Consular Reports on Trade and Finance: Turkey. London: Harrison and Sons, 1887, 1888, 1889, 1890, 1892, 1893, 1894, 1895, 1896, 1897, 1898, 1899, 1900, 1901, 1902, 1903, 1904, 1905, 1906, 1907, 1908, 1909, 1910, 1911, 1912, 1913, 1914. N. pag. *House of Commons Parliamentary Papers, 1801-1900 [ProQuest]*. Web.

Mead, Elwood. "The Report of Dr. Elwood Mead and Associates." *Reports of the Experts Submitted to the Joint Palestine Survey Commission.* Boston, MA: Daniels Printing, Incorporated, 1928. 5-65. *Hathi Trust*. Web. 19 Mar. 2016.

Memorandum Submitted to the Palestine Royal Commission on Behalf of the Jewish Agency for Palestine. 1936. Reprint. Westport, CT: Greenwood, 1975.

Peel, William Robert Wellesley. *Palestine Royal Commission Report Presented by the Secretary of State to for the Colonies to Parliament by Command of His Majesty.* London: His Majesty's Stationery Office, 1937. Print.

Reports from Her Majesty's Consuls on the Manufactures, Commerce, &c. of Their Consular Districts. Rep. London: Harrison and Sons, 1866, 1867, 1868, 1873, 1876, 1877, 1878, 1879, 1880, 1881, 1883, 1884, 1885, 1886. *Hathi Trust.* Web.

Reports from Her Majesty's Consuls on the Manufactures, Commerce, &c. of Their Consular Districts. Rep. London: Harrison and Sons, 1872, 1876. *House of Commons Parliamentary Papers, 1801-1900 [ProQuest]*. Web.

Reports Relative to British Consular Establishments: 1858 & 1871. Rep. London: Harrison and Sons, 1872. *House of Commons Parliamentary Papers, 1801-1900 [ProQuest]*. Web. 13 Feb. 2016.

Report on Palestine Administration. London: H.M.S.O., 1922, 1923, 1924, 1925, 1926. *Hathi Trust*. Web. 25 Feb. 2016.

Report by His Britannic Majesty's Government to the Council of the League of Nations on the Administration of Palestine and Trans-Jordan. Rep. London: H.M.S.O., 1925, 1926, 1927, 1928, 1929, 1930, 1931, 1932, 1933, 1934, 1935, 1936, 1937, 1938, 1939, 1940, 1941. Reprint. Archive Editions, 1995.

Samuel, Herbert. *Report of the High Commissioner on the Administration of Palestine 1920-1925*. Rep. London: H.M.S.O., 1925. Reprint. Archive Editions, 1995.

Shaw, Walter. *Report of the Commission on the Palestine Disturbances of August, 1929*. London: H.M.S.O., 1930. *Hathi Trust*. Web.

Simpson, John Hope. *Palestine: Report on Immigration, Land Settlement and Development*. London: H.M.S.O., 1930. LLMC Digital. Web.

Stead, K. W. *Economic Conditions in Palestine*. Rep. London: H.M.S.O., 1931. Reprint. Archive Editions, 1995.

Stead, K. W. *Report on the Economic and Financial Situation of Palestine*. Rep. London: H.M.S.O., 1927. Reprint. Archive Editions, 1995.

Books and Articles

Aaronsohn, Ran. "The Beginnings of Modern Jewish Agriculture in Palestine: "Indigenous" vs "Imported"." *Agricultural History* 69.3 (1995): 438-53. Print.

Adams, Frank. "Palestine Agriculture." *The Annals of the American Academy of Political and Social Science* 164.1 (1932): 72-83. *JSTOR*. Web. 05 Oct. 2015.

Conder, Claude R. *Palestine*. London: G. Philip & Son, 1889. *Hathi Trust*. Web. 28 Jan. 2016.

Ben-Artzi, Yossi. "Changes in the Agricultural Sector of the Moshavot, 1882-1914." *Ottoman Palestine, 1800-1914: Studies in Economic and Social History*. Ed. Gad G. Gilbar. Leiden: E.J. Brill, 1990. 133-58. Print.

Ben-Gurion, David. "From the Founding of Petah-Tikva to the Present Day." *The Jews in Their Land*. Garden City, NY: Doubleday, 1966. 270-373. Print.

Buheiry, Marwan R. "The Agricultural Exports of Southern Palestine, 1885-1914." *Journal of Palestine Studies* 10.4 (1981): 61-81. Web.

Cuinet, Vital. *Syrie, Liban Et Palestine, Géographie Administrative, Statistique, Descriptive Et Raisonnée*. Paris: E. Leroux, 1896. *Google Books*. Web. 11 Feb. 2016.

El-Eini, Roza I.M. "British Agricultural-educational Institutions in Mandate Palestine and Their Impress on the Rural Landscape." *Middle Eastern Studies* 35.1 (1999): 98-114. *JSTOR*. Web. 25 Feb. 2016.

Erskine, Steuart. *Palestine of the Arabs*. 1935. Reprint. Westport, CT: Hyperion, 1976. Print.

El-Eini, Roza I.M. "Rural Indebtedness and Agricultural Credit Supplies in Palestine in the 1930s." *Middle Eastern Studies* 33.2 (1997): 313-37. *Routledge*. Web. 25 Feb. 2016.

Eliav, Arie Lova. *Land of the Hart: Israelis, Arabs, the Territories, and a Vision of the Future*. Trans. Judith Yalon. Philadelphia: Jewish Publ. Soc. of America, 1974. Print.

George, Alan. ""Making the Desert Bloom" A Myth Examined." *Journal of Palestine Studies* 8.2 (1979): 88-100. Web.

Gervasi, Frank. *The Case for Israel*. New York: Viking, 1967. Print.

Gilbert, Martin. *Israel: A History*. New York: Morrow, 1998. Print.

Horowitz, David. *Economic and Social Transformation of Palestine*. Rep. N.p.: n.p., 1937. *Center for Israel Education*. Jewish Agency, 2014. Web. 25 Feb. 2016.

Issawi, Charles. "Middle East Economic Development, 1815-1914: the General and the Specific." *The Modern Middle East: A Reader*. Ed. Albert Hourani, Philip S. Khoury, and Mary C. Wilson. Berkeley: U of California, 1993. 177-193. Print.

Katz, Samuel. *Battleground: Fact and Fantasy in Palestine*. 3rd ed. Toronto: Bantam, 1985. Print.

Kelly, T. "'A Land of Rock, Marshes and Sand'? Forests, Orchards and Legal Inequality in Israel/Palestine." *Social & Legal Studies* 22.4 (2013): 575-81. *SAGE*. Web. 19 Oct. 2015.

Khalidi, Walid. *Palestine Reborn*. London: I.B. Tauris, 1992. Print.

Kimmerling, Baruch, and Joel S. Migdal. *Palestinians: The Making of a People*. New York: Free, 1993. Print.

Laqueur, Walter. *A History of Zionism*. New York: Holt, Rinehart and Winston, 1972. Print.

McCarthy, Justin. *The Population of Palestine: Population History and Statistics of the Late Ottoman Period and the Mandate*. New York: Columbia UP, 1990. Print.

Montefiore, Moses. *Translations of a Letter to the Jewish Congregations in the Holy Land on the Promotion of Agriculture and Other Industrial Pursuits in That Country and of the Replies Received Thereto*. London: Wertheimer, 1874. *HathiTrust*. Web.

Owen, Roger. *The Middle East in the World Economy, 1800-1914*. London: Methuen, 1981. Print.

Oren, Michael B. *Power, Faith, and Fantasy: America in the Middle East, 1776 to the Present*. New York: W.W. Norton, 2007. Print.

"Palestine Agriculture to Be Aided by Drive." *New York Times* 19 Apr. 1931: 113. *ProQuest Historical Newspapers*. Web.

"Palestine: Land Ownership by Districts." *Village Statistics, 1945*. United Nations, 1945. N. pag. *Wikimedia*. Web.

Prittie, Terence. *Israel; Miracle in the Desert*. New York: Praeger, 1967. Print.

Revusky, Abraham. *Jews in Palestine, by A. Revusky*. New York: Vanguard, 1936. Print.

Ruppin, Arthur. "The Return of the Jews to Agriculture." *Zionist Work in Palestine*. Ed. Israel Cohen. New York: Judean, 1912. N. pag. *Hathi Trust*. Web. 25 Feb. 2016.

Scholch, Alexander. "European Penetration and the Economic Development of Palestine 1856-1882." *Studies in the Economic and Social History of Palestine in the Nineteenth and Twentieth Centuries*. Ed. Edward Roger John. Owen. Carbondale, IL: Southern Illinois UP, 1982. N. pag. Print.

Shafir, Gershon. *Land, Labor, and the Origins of the Israeli-Palestinian Conflict, 1882-1914*. Cambridge: Cambridge UP, 1989. Print.

Skolnik, Fred. "The State of Israel (1948-2000)." *A History of Israel and the Holy Land*. Ed. Michael Avi-Yonah. 4th ed. New York: Continuum, 2001. N. pag. Print.

Smith, Barbara J. *The Roots of Separatism in Palestine: British Economic Policy, 1920-1929*. Syracuse: Syracuse UP, 1993. 112.

Spiegel, Irving. "Jewish Fund Box Hailed at Jubilee." *New York Times* 20 Jan. 1951: 15. *ProQuest Historical Newspapers*. Web.

Swedenburg, Ted. "The Role of the Palestinian Peasantry in the Great Revolt (1936-1939)." *The Modern Middle East: A Reader*. Ed. Albert Hourani, Philip S. Khoury, and Mary C. Wilson. Berkeley: U of California, 1993. N. pag. Print.

Temper, Leah. "Creating Facts on the Ground: Agriculture in Israel and Palestine." *Historia Agraria* 48 (2009): 75-110. Print.

The Origins of Israel, 1882-1948: A Documentary History. Madison: U of Wisconsin, 2011. Print.

Weinryb, Bernard D. "Middle Eastern Agriculture in the Inter-War Years." *Agricultural History* 26.2 (1952): 52-59. *JSTOR*. Web. 16 Dec. 2015.

Whither Palestine? A Statement of Facts and of Causes of the Arab-Jewish Conflict in the Holy Land. New York City: Arab National League, 1936.*HathiTrust*. Web. 25 Feb. 2016.

Yitzhak Wilkansky. *The Collective Agricultural Settlements in Palestine (1927)*. 1927. *The Origins of Israel, 1882-1948: A Documentary History*. Madison: U of Wisconsin, 2011. N. pag. Print.