OPEN FIELDS IN SCANDINAVIA,  
CA 1200 – 1850  
A preliminary sketch  

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SWEDEN AND SCANDINAVIA  

This paper will focus on Sweden although Denmark and to some extent Norway will also be treated. The three countries cover together a large area, not least along the north-south axis, which is especially important for agriculture. From Denmark’s southernmost point it is as far to Norway’s northernmost tip as it is to Sicily. In relatively densely populated parts of Denmark and Sweden open-field systems developed in the Middle Ages but in the more thinly populated areas were found, still in the 18th century, more primitive farming systems such as continuous cropping (ensäde) and swiddening (slash-and-burn or burn-beating, svedjebruk). This state of things, combined with the relatively strong and active central government that existed especially in Sweden since the first half of the sixteenth century, have resulted in large quantities of detailed source material that give us the opportunity to study conditions whose equivalents are found in much earlier periods of time in other parts of Western Europe.¹  

Most of Denmark and the southernmost parts of Sweden (Skåne) belong to the same climatic zone as northern Germany. In the far north, on the other hand, Norway and Sweden extend beyond the polar circle. Consequently, the differences within Scandinavia with respect to the  

¹ Myrdal 2011, 74-75; Gadd 2011a, 123-129
length of the growing season are great. On the plains of southern Skåne (Scania) in the very
south of present-day Sweden the growing season is around 220 days, at the latitude of
Stockholm ca 180, but at the northernmost tip of Sweden around 110 days.²

The geological conditions also differ widely. Most of the Danish Jylland (Jutland) peninsula
consists of glacial sand, which provides relatively poor conditions for arable farming. On the
other hand parts of eastern Jutland, the greater part of the Danish islands and, on the Swedish
side of the Sound, the plains of Skåne consist of calcareous clay till on which conditions for
agriculture are relatively good. As from northern Skåne up to the latitudes of the great
Swedish lakes is found a roughly 200 km long upland area with acidic till soils that are mostly
unsuitable for arable farming and which is largely covered in coniferous forest. Thin
sedimentary deposits along watercourses and on the bottom of former Ice Age lakes offer a
chance to farm in certain areas however, as does the relatively fine till on the top of hills and
ridges.³

Another plains area, mostly dominated by alluvial clays is to be found in central Sweden
roughly at the latitudes of the great lakes (Vänern, Vättern and Mälaren). While south of Lake
Vänern -- in the western parts of this region -- are found relatively vast, uninterrupted deep-
clay plains, in the east the clay sediments are thinner (but hardly less fertile) and more split-
up, often being interrupted by till areas.⁴

The northern 60 per cent of Sweden, from a latitude of about 150 km north of Stockholm, is
dominated by taiga-like coniferous forest. Still around 1700, the sedentary population of
Norrland lived near the coast, where the sediments from the many rivers that fall into the Gulf
of Bothnia helped to make the soil relatively fertile. Norway is predominated by mountain
massifs and high plateaus with no scope for agriculture. Less that three per cent of its landed
surface has ever been cultivated.⁵

² Wastenson et al.,1992, 16-17.
³ Gadd 2011, 119.
⁴ Gadd 2011,119.
⁵ Frandsen, 1983; Gadd, 2011a, 119-120; Gadd 2011b, 265-267.
In 1750, the Danish isles had a population density of 30, and the Jylland peninsula 12 inhabitants per square kilometer, making an average for the whole of Denmark of 18, which was slightly above the average for the western half of Europe but less than half the contemporary averages for Germany, France and England and Wales. The mean figures for the two other Scandinavian countries were much lower than for Denmark: Norway as a whole had 2 inhabitants per square kilometer and Sweden had 4. The regional differences within these countries were great, however. About 90 per cent of Norway was uninhabited, which made the population density of the settled areas correspondingly higher. In Sweden, the northern three-fifths of the country had, on average, less than 1 inhabitant per square kilometer while the mean figure for the southern two-fifths of the country was 10, and the most densely populated plains in Skåne and parts of the Central-Swedish lowlands about 20.

The differences in population density is mirrored in the proportion of the country that was arable land. In 1700, the Danish islands and the Skåne plains had a cultivation rate at about 50 per cent; parts of the island of Sjælland (Sealand) even as much as 70-80 per cent. In the remaining parts of early 18th-century Scandinavia cultivation rates were much lower. In the wooded till-soil uplands of the interior of southern Sweden about 2 per cent of the land was arable, and in the Central-Swedish plains a relatively modest 10-25 per cent. In the vast taigas of the Norrland interior the cultivation rate was close to nil which brought down the average for the whole of Sweden to about 2 per cent.

Between 1000-1350 the Scandinavian population roughly doubled, which seems about the same increase as the that of the rest of Europe. All Scandinavian countries were hit by the late-medieval crisis, but thereafter the population development differed widely between different parts of Scandinavia. Denmark experienced a very slow population recovery and the Danish population figure of 1300 was not surpassed until 1810. In the two other countries the population increased roughly threefold between 1500 and 1750. It was the less populated

6 Johansen 2002, ####; Statistisk Årbok (Denmark) tables 3 and 34.
7 Gadd 2011a, 119.
8 Frandsen 1988, 17; Gadd 2000, #####.
9 Gadd 2000, #####.
parts of Scandinavia that population increase was the fastest, and, as we shall see, this served as one of the motive forces behind changes in farming systems.\textsuperscript{10}

\textbf{A note on social structure}

Those who held land in Scandinavian villages (apart from persons of rank) will be called peasant farmers (Sw. \textit{bonde}). A peasant farmer, as a rule, had enough land, animals and implement to be self-sufficient and pay taxes or rents to the Crown or a noble landowner. However, especially in the 18\textsuperscript{th} and 19\textsuperscript{th} centuries the number of households per village, as a rule, much exceeded the number of peasant farms (\textit{bondgårdar}). Below the peasant-farmer stratum existed a stratum of landless and semi-landless such as the Danish \textit{husmænd} (cottagers) and the Swedish \textit{torpare} (crofters) and \textit{backstugusittare} (landless cottagers) who were either completely landless or who tilled smallholdings that were never counted as farms. These unlanded strata grew in numbers from the 16\textsuperscript{th} century on. In Denmark, for every 10 peasant farmers (\textit{bönder}) there were in 1650 5 and in 1770 10 \textit{husmænd} , and in Sweden in 1750 for every 10 peasant-farmers there were about 4 crofters, cottagers and allotted soldiers.\textsuperscript{11}

\textbf{THE MIDDLE AGES: FROM SINGLE FARMS TO OPEN FIELDS}

\textbf{South of Scandinavia}

Evidence from Germany from the 6\textsuperscript{th} to 9\textsuperscript{th} centuries show a system of farms in severalty having their arable in one or a few fields that were often rectangular in shape.\textsuperscript{12} In the following centuries this system gradually developed into a communally regulated system of

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\begin{itemize}
  \item \textsuperscript{10} Gadd 2011a, 158; Richards 1990, 264 (Western half of Europe = Europe except European parts of former USSR.
  \item \textsuperscript{11} Gadd 2011b, 282; Gadd 2011a, 140-141. About allotted soldiers, see Gadd 2011, 141.
  \item \textsuperscript{12} Thirsk 1964.
\end{itemize}
}
open fields through the simultaneous processes of increased grain cultivation, the establishment of common fields, the scattering of strips within these fields and the concentration of settlements into villages.\textsuperscript{13} It seems like the principle of one-year fallow developed before the establishment of common fields. Three-course rotation is mentioned in German sources from the 9th and 10th centuries while open fields, in which all landholding villagers held several strips that lay scattered through two or three large fields, developed in the following centuries.\textsuperscript{14} In parts of Germany, Northern France and England these systems were fully developed around 1200 when a social organization adapted to the communal use of open fields had developed.\textsuperscript{15} \textit{Inter alia}, it is by that time that a system of village herdsmen is found.\textsuperscript{16}

\textbf{Scandinavia}

In Denmark and parts of Sweden a similar chronology has been found. Danish farms were as a rule held in severalty still around 800, each one holding an enclosed area called \textit{toft} (pl. \textit{tofter}) that contained both meadow and arable. Conditions were similar in east-central Sweden.\textsuperscript{17}

In course of time, the arable increased as a result of land clearance. The latter took place partly within the \textit{tofter}, partly outside of them on the common ground.\textsuperscript{18} When land clearance took place inside the boundaries of the toft it encroached on the meadow, when it took place outside of the \textit{toft} it encroached on common grazing. In southernmost Skåne pollen analysis has shown that fallowing took place within the \textit{tofts} in the 9\textsuperscript{th} and 10\textsuperscript{th} centuries, although the fencing system probably remained the simple kind typical of continuous cropping. As long as

\textsuperscript{13} Muller-Wille quoted by Widgren, ####, 176; Hoff 1997, 208-09.

\textsuperscript{14} Hoff 1997, 184, 208-209.

\textsuperscript{15} E.g. Comet 1997, 30.


\textsuperscript{17} Hoff 1997, 175; Myrdal 1999, ####.

\textsuperscript{18} Hoff; Widgren
the arable was a relatively small part of all land there was little reason to develop regulated fallowing and fencing systems. But since the amount of manure did not increase at the same pace as the arable, the necessity of fallowing increased. When fallow took up a larger part of the land its potentials as grazing ground had to be used more systematically. Furthermore, increasing cultivation of autumn-sown grain involved a need to close parts of the arable from grazing animals in the autums. The erection of more complicated fencing systems on each toft would obviously involve large costs in the form of fencing wood and labour. The solution was that several farms co-operated around a common fencing system. Fencing costs were saved through the redistribution of land and the creation of larger fields. In this process the system of fallowing every second or third year was applied more thoroughly. More or less complete two- and three-field systems have come into existence in the Danish-Scanian area the 13th century, and a similar chronology has been observed in the Central-Swedish plains. It is uncertain, however, if the subdivision into strips had developed as far in the Middle Ages as to be similar to the systems found in the 17th century (see below). It has been pointed out that the Scanian law (c.1210) mention fields in which parcels seem to be rectangular (have a blockstruktur) rather than long an narrow. Similar observations have been made in a study of deeds of transfer (diplom) from Uppland in the 15th century.

SCANDINAVIA IN THE 17TH CENTURY

Large mapping projects that were carried out in the 17th century make it possible to bring out clearly the boundaries of the Swedish and Danish open-field areas. In Denmark and Skåne was found one open-field region that extended from eastern Jylland over the Danish islands to comprise the Skåne plains. In the major part of this south-Scandinavian open-field region the three-field system was used; only in eastern Jylland, western Fyn (Funen) and a relatively small region in the interior of Skåne two field systems were used (Figure 1).

This southern three-field area thus prevailed on both sides of the Sound and, with the exception of the southernmost of the Danish islands, shared the same crop rotation, which was


20 Frandsen 1983, 7; Rahmqvist 2013.
fallow-barley-rye (not, that is, the fallow-rye-barley rotation prevalent on the continent and the most southerly Danish isles) and the same system for division of arable land into strips, bolskifte. The cultural kinship between the Danish islands and Skåne (which was an important part of Denmark up to 1658) is shown also in agricultural tools (wheel plough and wheel ard), building style (half-timbered houses) and linguistic similarities between the Scanian dialect and Danish, not least in agricultural terminology.

In Denmark and Skåne most villages contained 10-20 farms although villages with 30-40 and even 50 farms were also found. Figure 3 shows the fields of a village on the Skåne plains in 1703. The total arable area of this village was c. 240 hectare. 11 peasant-farmers lived in the villages, which makes 22 ha per farmer. Considering the three field system, about 15 ha per peasant farmer might be expected to be tilled and sown each year, but it is not probable that the sown area per farmer was quite that large. In the Scanian plains and in Denmark less fertile parts of the arable were sown less often, e.g. every third or every sixth year instead of the normal two year of three. About 13 hectares per farmer seems probable, as an informed guess. Each farmer in Lilla Uppåkra had about 50 strips. In Denmark in the 1780s it was quite normal for a farmer to hold about 60-70 strips (there is one extreme example of 97 strips)\(^\text{21}\), which, considering the lower frequency of cropping on some of the land, would make, very approximately, 35 strips to till and sown each year.\(^\text{22}\)

Another open-field area was found in central Sweden, i.e. the lowland areas around the great Swedish lakes. This Central-Swedish open-field area never reached the Swedish west coast but took the shape of a triangle with a western corner south of Lake Vänern and widening towards the south-east and the north-east, the triangle’s eastern side stretching roughly between Kalmar and Sundsvall. The field system of this Central-Swedish area was mainly two-field, although a three-field region was found in the south, bordering towards the continuous-cropping area of the South Swedish Highlands.

In eastern and south-eastern Sweden (i.e. roughly between the towns of Gävle in the north and Kalmar in the South and east of the long and narrow lake Vättern) was found an extremely regulated form of strip division, called solskifte (sunwise field division; lit. ‘sun-divison’). In

\(^{21}\) Dombernowsky 1988, 230.

\(^{22}\) Gadd 2000, 123-125; Frandsen 1983; Frandsen 1988 ###.
this form of strip division, in which the sequence of farmhouse plots in the village site reappeared the sequence of strips in each furlong of the village fields, and the width of each farm’s house-plot reflected the width of the farm’s total arable land holding as well as its share in the village’s meadow and outlying land. Solskifte was recommended in the east-Swedish provincial laws of the 13th century. Figure 4 shows a solskifte village in Östergötland county, 1694. Typically, the hamlets and villages of East-Central Sweden were small. This village contains five homesteads and one utjord belonging to a farm I another village. The total arable of the village was 62 ha or 12 ha per peasant farmer, and the number of strips per farmer was about 35. Each season the farmer tilled and sowed about 6 ha distributed over 17 strips.23

Figures 5-6 show the radically different two-field system that was found south of Lake Vänern, Western Swede. This system was adapted to spring-sown crops so there was little need to protect an autumn-sown crop from grazing animals. The fencing system was very simple. Instead of two arable fields and one or more meadow fields there was just one fence dividing the village’s land in two parts. The grasslands on the same side of the fence as that year’s fallow would serve as grazing ground, the grasslands on the side of the cropped field would serve as meadow. In this way, the boundary between infields and outlying land (normally an important line in other Scandinavian open-field systems) was dissolved. The irregularity of this system is emphasized by the unequal number of strips in the two parts of the arable: 11 on one side of the fence and 15 (smaller) ones on the other.24

In Värmland, western Sweden (north of lake Vänern) was found a system with four or five fields which may have some connection with similar systems in parts of Norway where this system was mentioned in Medieval laws.25 However in Norway and previously-Norwegian Bohuslän was also found continuous-cropping systems using one common field with relatively extensive strip division.26

23 Gadd 2000, 120-121.


26 Myrdal 2011, 83-84; Almås (ed) 2004, 113-116; 171-72; Widgren 1997, ######.
In the main, Scandinavian open-field systems followed the same pattern as their continental and English counterparts. Some characteristics of the Scandinavian open-field systems, especially those in central Sweden and Finland, should be observed, however.

The villages and their fields were, as a rule, smaller than was usually the case in Western Europe south of the Baltic. This applied less to the Danish-Scanian and more to the eastern parts of central Sweden.

Furthermore, in central Sweden north of Skåne the cultivation rate was lower than in most other European open-field regions, which involved that meadows and pastures played a relatively more important part in the agrarian economy.

Thirdly, the fields or tracts were carefully and totally fenced-in. This applied both to the Danish-Scanian and the Central-Swedish regions. This differs from the continental and British systems where fencing of the fields was, at most, partial. South of Scandinavia mounted herdsmen were essential for keeping grazing animals away from the standing crops and the growing grass of the meadows. Such professional, adult herdsmen did not, as a rule, exist in Sweden north of the Skåne plains. In Sweden, as a rule, sheep and goats, and in parts of the grazing season also the cattle, were tended by boys and girls, often in their lower teens. Skåne and Denmark constituted a transitional area between central-Scandinavian and continental conditions. In the Danish-Scanian open-field area mounted “guardians of fences” were the norm, i.e. men who did not primarily tend the animals but had as their first-hand function to supervise fences and gates.Conductive to the use of fences instead of mounted herdsmen in Scandinavia was probably the small villages (which made a specialized herdsman for each village uneconomical), and the relative abundance of fencing timber or brushwood.

*Field-grass farming and continuous cultivation*

Around 1700, west of the Danish open-field area, was found in the major part of Jylland a system of field-grass farming (Da.: *græsmarksbrug*), in which limited areas were cultivated

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28 Lindgren 1939, 85; Gadd 2000, 174-75.
and sown for a number of years and thereafter laid out to grazing. In principle, one such area was taken in for tilling and manuring each year, while another was put to grass.\textsuperscript{29}

In most woodland and some transitional areas of Sweden continuous cropping (\textit{ensäde}) was prevalent still in the 17\textsuperscript{th} and 18\textsuperscript{th} centuries.\textsuperscript{30} Since the definition of open fields usually mention two or more fields in which one of the fields was fallowed each year, the continuous-cropping system -- in principle, a one-field system without fallow -- does not tally with the definition of open fields. Nevertheless the two phenomena -- open fields and continuous cropping -- shared important similarities. Like in the Scandinavian open-field systems, the fields under continuous-cropping were fenced-in. It differed from most open-field systems, apart from being a one-field system without regulated fallow, in that most of the meadow, as a rule, lay within the same fence as the arable. While in a system in which a meadow was separately fenced-in, it could be used for grazing after hay-making (which was the case with most Scandinavian open-field systems), in the case of the continuous cropping the grazing of the mown meadow had to await the opening of the fences in the autumn. The continuous-cropping system was typical of the solitary farms and small hamlets of the woodlands where arable farming was of limited importance compared to cattle raising and various sideline occupations such as charcoal making or handicrafts. Furthermore, swiddens often complemented the arable tilled by the woodland farmers (Figure 7). However, still in the 17\textsuperscript{th} century the continuous-cropping system was also used in some transitional areas between woodlands and plains. In such districts the infields that contained arable and meadow were often relatively large, with farms and hamlets spread out around them (Figure 8). As a rule, each farm’s or hamlet’s arable lay relatively close to the farm site, so the division into strips was never as extensive as in two- and three-course rotation areas. Since grazing animals regularly was let into the arable field after the crop had been gathered, the same type of communal decisions were necessary as with fully developed open fields.\textsuperscript{31}

The rapid land clearing had the result that arable grew more than the fodder resources and hence the supply of manure. Some strips were therefore left unsown in a sort of several-years

\textsuperscript{29} Frandsen 1983, 253-254, 260.

\textsuperscript{30} Myrdal 2011, 85; Gadd 2000, 128.

\textsuperscript{31}
long, untilled fallow or ley. In the 18th century, in those continuous-cropping areas which had a relative high cultivation ratio, tilled one-year fallow was substituted for the leys, although the fallowed strips were still in the same field as, and intermingled with the sown strips. This was obviously a more labour-intensive way of treating the fallow but also involved a more intensive land use than the old leys.  

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THE TRANSITION FROM CONTINUOUS CROPPING TO THREE-FIELD SYSTEM.

Some late examples from Sweden

After 1500, changeover from continuous cropping to three- or four-course rotations occurred mostly in the central and south-eastern parts of the country, where rye cultivation made progress.

Two studies that use the surveyor’s maps from the 1640s is Gunnar Lindgrens (1939) and Aadel Vestbô-Franzén (2004). Lindgren studied Falbygden, a ca 1100 square kilometer large area in central Västergötland which in the 1640s could be characterized as a transitional area between plains and woodland. The plainsland character of this high plateau was growing stronger, however, and different from other part of the South Swedish Highlands, the soil type of the area – clay till – provided good conditions for agriculture. In the 1640s, the Falbygden region was divided between an open-field area in the east and a continuous-cropping area in the west. The dividing-line between the two areas was sharp. In the open-field area a three-field system was used and most of the meadow was fenced off from the arable fields. In the continuous-cropping area all the arable and most of the meadow lay within the same fences.

Both the three-field area and the continuous-cropping areas were geographically connected to other areas with similar field systems, i.e. the three field system continued east and north of the Falbygden region, continuous cropping towards north, west and south-east. Lindgren considered the situation around 1640 as a result of the three-field system advancing westwards at the expense of previously existing continuous cropping. Later research agrees

with him on this point, but there is some uncertainty about the time for the spread of the three-field system. While Lindgren thought that the expansion was medieval, many modern scholars who have dealt with the subject seem inclined to believe that the change took place mainly after 1500.\textsuperscript{33} In my opinion, there are important circumstances that points towards the spread having taken place after 1550.\textsuperscript{34}

The arable per homestead in the three-field area was 30 per cent larger than in the continuous-cropping area. Accordingly, if all arable except the fallow fields were sown, the sown area per homestead was of equal size in the two parts of Falbygden. Evidently, at the introduction of the three-field system more land has been brought under cultivation in order to compensate for the reduction in sown area in consequence of the fallow. On the other hand, the area used as meadow was smaller in the three-field area. In the most cultivated parts there, the meadow was barely larger than the arable, while in the continuous-cropping area as a whole the meadow was three times the size of the arable. The transition from continuous cropping to a three-field system thus involved an alteration of the main focus of farming from stock breeding to arable farming.\textsuperscript{35}

Not only field division, but also field subdivision and settlement structure were quite different in the two areas. True, the infields (arable and meadow) of the continuous-cropping area was characterized by a sort of common fields insofar as the arable and meadow of several farmsteads and hamlets lay within the same fenced area. In the continuous-cropping area the parcels (strips) were as a rule more or less rectangular and the number of parcels per homestead was relatively small. The division into strips was much less extensive than in open-field areas since farms and hamlets lay dispersed along the long fence that enclosed the

\textsuperscript{33} See, e.g. Jansson 1998, 223.

\textsuperscript{34} Myrdal and Söderberg 1991, 128-129, show that between 1571 and 1642, there was a sharp change in the proportions between different kind of corn that were cultivated in eastern Falbygden: the proportion of oats increased from 13\% to 57\%. A similar change in corn proportions is consided by Vestbø-Franzen (2004) to be a clear indication of a change from continuous cropping to three-field system (####). Furthermore, the state demesne (\textit{kungsgård}) of Orreholmen in the parish of Skörstorp, which lay in within the three-field area in 1640, used continuous cropping in 1564-66 (Myrdal and Söderberg 1991, 308. For parishes and the boundary between field systems, see Lindgren 1939, 3,5.

\textsuperscript{35} Lindgren 1939, 74, 94.
infields and each farm’s parcels lay close to its building site. The farms that lay around such a fenced-in area functioned as a village when it came to common decisions. However, it should be observed that the landholding structure of the 1640s is not the same as that described earlier from the Early Middle Ages (or as it is called in Scandinavia, the Viking Era) with a fenced-in toft for each farmstead or hamlet. As we have seen, the fences of Falbygdens continuous-cropping district enclosed much larger areas than the toft of one farm.

In the three-field area the structure was quite different. The average size of the farm agglomerations were much larger. 58 per cent of homesteads in the three-field area lay in villages that contained 12 farmsteads or more, while 9 per cent were single farms. The corresponding percentages found in the continuous-cropping area were 27 and 21 per cent respectively. Furthermore, the strips of the open-field area were different in shape and number: long and narrow and much more numerous per homestead. The area covered by a strip was thus much smaller. According to Lindgren, this is explained by a dividing-up of the parcels at the changeover from continuous cropping to a three-field system. One of the reasons for larger villages seems to have been the need of co-operation as regards the fields and especially the fences. With Lindgren’s words, stock rising was the agglomerating factor, while the access to arable in each separate case put an upper limit to the size of the agglomeration.

After the 1640s, field systems changed remarkably little in the Falbygden area before the old farming structure was entirely dissolved as a consequence of the far-reaching consolidation of strips (“enclosures”) after 1800. What did happen was that the system of fallow within the single continuous-cropping field – in which the fallow strips lay side by side with cultivated strips in the same field – developed further, so that up to ¼ of the arable in the most cultivated continuous-cropping parishes lay fallow.

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37 Lindgren 1939, 92.
38 Lindgren 1939, 106.
A riddle that should give rise to further discussion in the future, is how the transition from continuous cropping to the three-field system was organized. Many of the villages that came into being in the Falbygden area were relatively large, containing 20, even 30 homesteads. As we will see after having looked closer on Småland in the same period, there is reason to remember, that the continuous-cropping system found in Falbygden in the 1640s need not have been exactly the same as the continuous-cropping that existed a hundred or hundred and fifty years earlier.

Aadel Vestbö Franzén (2004) studied the transition from continuous cropping to three-field system in northern Småland, a process which with relative certainty can be assigned to the period 1550-1630 (that is, about the same period that seems probable for Falbygden). The environment of northern Småland can be described as woodland, but this character was growing weaker due to continuing deforestation. Vestbö-Franzén finds similar differences between continuous cropping and three-field system as Lindgren found in the Falbygden area, which is that the transition to three field has involved a change from more or less rectangular parcels to longer, narrower and smaller strips and an agglomeration of farm sites to larger hamlets or villages. However, agglomerations were generally smaller in northern Småland than in the Falbygden area. 40 Especially in the part of the studied area hat had experienced the most complete transition from continuous cropping to the three-field system (Norra Vedbo and Södra Vedbo) the hamlets were relatively small, often two or three homesteads only. In a more easterly part of the studied area, Östbo (which had about the same natural conditions as the two Vedbo hundreds) had larger hamlets or villages. In Östbo, the villages had, as a rule, retained continuous cropping while single farmsteads much more often had changed to the three-field system. Some villages had mixed systems. Thus, the boundary between continuous cropping and thee-field system was not as sharp as in the Falbygden area. Vestbö-Franzén concludes:

"The fact that large villages retained ensäde whilst single farmsteads and smaller hamlets in their vicinity went over to a three-field system suggests that connection restrictions may well have been so numerous and so difficult to overcome that it was considered more

practical to retain ensäde with spring rye. An analysis of Vetlanda parish where both one-field and three-field systems were practiced shows that this was most probably the case."\(^{41}\)

In some cases, Vestbø-Franzén shows that the transition from continuous cropping to a three-field system was in the process of being implemented at the time of surveying.\(^{42}\) It is interesting that such cases start out from a situation of single farms with separately enclosed arable that reminds of the *tofter* that we found in the studies of early-medieval Scandinavia. The entering of a larger field system in such cases could take place gradually. E.g., a farm would have some of its arable in the new three-field system and retain some of its old, enclosed fields during a transitional period, and postpone the moving of the houses to a new site until a change of generations had taken place. The creation of a new field system and the moving of farms to a new village site demanded simultaneous action by several farmers only to a limited degree.

If we return to Falbygden for a moment and consider the much larger villages that were found there it seems difficult to explain how these large villages could be created during relatively short period of time. This should cause further research and discussion. One obvious further question is, if the structure of the continuous-cropping landscape was the same when the change to a three-field system started, as it was on western Falbygden when the land surveyors mapped the area around 1640. To change from continuous-cropping systems similar to those found on Falbygden c 1640, with their vast infields held in common, must have been a difficult task indeed. If, instead, the homesteads and small hamlets looked more like those found in northern Småland, where each farm or small hamlet had its own fenced infield, the change to the three-field system would, in all likelihood, have been somewhat easier.

**LINKS TO TECHNOLOGY**

\(^{41}\) Vestbø-Franzén 2004, 235-236.

\(^{42}\) Vestbø-Franzén 2004, 81, 83.
What links were there to technology? The transition to two- and three-field systems after A.D. 1000 made necessary certain innovations in implements. Before the introduction of one-year fallow typical of the new crop rotations, leys had been used that lasted several years and were broken with a spade when ready to be cultivated again. The wooden shares or small iron shares of the older plough implements had been incapable of breaking ground that had been overgrown when lying fallow during a summer (not to speak of several summers) so the new biennial or triennial rotations necessitated the use of new, heavier implements with heavier shares. The mouldboard plough spread in Denmark (including Skåne), and in Norway and adjacent parts of Sweden during the period 850-1200. In Denmark and Skåne weel ploughs and wheel ards were used, in Norway and Western Sweden, as a rule, foot ploughs. Traces of ridges made by wheel plough have been found in various parts of Denmark from the period 1000-1200. In eastern Sweden, where the ard remained in use until the nineteenth century, the iron shares of the ard were made larger and heavier after c. A.D. 1000, which made them, too, capable of breaking a one year old fallow.

Was there provision for individuals to invest in implements?

Technical change could and did take place. One protracted kind of change was the transition from using sickles to using scythes to harvest grain. This innovation required no great investment since the scythe was used already to mow grass in haymaking; the implement was merely put to new use. Compared to most of Western Europe, the harvesting scythe was adopted early in Scandinavia. As early as the middle of the 16th century the changeover started in the Swedish mining district (Bergslagen) which was outside the open-field regions. The new use of the scythe spread most rapidly in the period 1650-1750, and it was after 1700 it started to spread rapidly in Denmark. By 1850, scythe was the main harvesting implement in both countries, and the sickle used only in the inner parts of Norrland and in the woodlands of the South Swedish Highlands where the stony ground impeded the use of the scythe. In general, the changeover from sickle to scythe seems to have been propelled by the shortness

of the Scandinavian growing season and the increase in arable acreages that took place especially in Sweden. The scythe roughly doubled the area that could be harvested in a day.\footnote{Frandsen 1988, 56; Gadd 2011, 145-46.}

Between c. 1730-1820, iron ploughs gradually replaced wooden ploughs in western and northern Sweden. The iron plough (on which not only share and coulter but also the mouldboard and, after c. 1800, the land-side was made of iron). From its innovation centre in the mining area the new kind of plough spread relatively slowly before c. 1800, but more quickly in 1800-1815 when the relative price of iron was very low in Sweden and the price of grain high. By 1825 it was used by most peasant farmers in Western and West Central Sweden and in Norrland, which was the areas where ploughs rather than ards (or the two implements in combination) had traditionally been used. Wherever the iron plough was adopted, it came as a strong, rapid change across entire districts. In the plains south of Lake Vänern, where iron ploughs were a rarity as late as 1800, studies of probate inventories have shown that about 90 per cent of peasant-farmers had one by the 1820s. An iron plough was, on average, valued at 5-6 riksdaler in the inventories of the 1820s, and the value of a new iron plough may be estimated at c. 10 riksdaler, which was roughly equivalent to a barrel (147 liter) of rye or half the price of a cow. The iron ploughs were as a rule combined with new, deeper harrows,\footnote{Gadd 1983, 176. Riksdaler = riksdaler riksgälds.} but the increase in the use of iron was not limited to arable implements. Vehicles now had iron axels and iron-rimmed wheels, spades had iron blades instead of wooden blades with spade-iron. The greatest advantage of the iron ploughs was that there was so much less resistance in the soil that the number of draught animals could be almost halved. Thanks to the decreased need for fodder these iron tools contributed to the massive transformation of meadows and pastures into arable fields.

In the older literature, there is a common notion that manor farms and other large estates were always the earliest innovators. The research of later decades has modified this picture. While the pace of introduction of the harvesting scythe displays considerable differences between regions, no great divergence is noticeable between the peasant farms and larger estates within each region. When it came to the adoption of the iron plough and the new kinds of harrow, the picture differs between different parts of the country. In the mining area of Dalarna
(Dalecarlia) the peasant farmers were the forerunners in using the iron plough and in western Sweden the new implements were introduced more or less simultaneously on peasant and manor farms (although they penetrated more rapidly among the latter). In east-central Sweden and in the South-Swedish highlands the new implements spread more slowly among the peasant farmers, while the estate owners were clearly in advance. The reason why the difference between peasant and estate owner was greater in eastern than in western Sweden was that in the East the ard, not the mouldboard plough, was the traditional implement so that the transition from ard to iron plough was not only a matter of the material from which it was made, but of a new kind of implement and a new way of tilling the ground. In these parts of the country, the estate-owners, with their greater economic resources, did tend to pioneer the adoption of new plough implements and harrows.  

Changes within the open-field systems

In the 17th century it became more usual that temporarily fenced-in parts of the fallow field (evidently large enough to enclose a area in which all village members had strips) were sown with peas, and if the local climate permitted, beans. Flax and, after 1800, potatoes were also sown in such temporary enclosures so that in the 18th century the actual fallow was smaller than the 50 or 33 per cent of the arable that was, in principle, prescribed by the basic two- or three -field system. 

In the 19th century it became also usual to cultivate clover for animal fodder within such temporary enclosures on the fallow. This practice was found not least in the Central-Swedish two-field areas. The one-year periods of cultivation were hardly ideal for fodder crops, however, and as we shall see, the intention to introduce crop rotations better adapted to the cultivation of grasses and clover became an important reason for implementing the strip-consolidation (“enclosure”) reforms.


Richer peasant-farmers?

Technical changes, such as the substitution of the scythe for the sickle or of the iron plough for the wooden plough, led to higher productivity, but since innovations in implements had a tendency of coming as rapid changes across entire districts, it is doubtful whether such innovations entailed that individual farmers became richer than others, in the long run (no doubt, it contributed to the widening gap between peasant farmers on the one hand, crofter and other semi-landless and landless on the other). True, individual peasant-farmers in open-field villages could amass relatively great wealth. But, to the best of our knowledge, this seldom was mainly the result of their way of tilling the soil. Before 1850, it seems to have been more important to hold a farm which was relatively lightly burdened with taxes and rents, to be a sole inheritor of a farm or to marry the right person in order to combine the wealth of two families.48 Furthermore, even if certain peasant-farmer families amassed large landholdings amassed during one or two generations, the emergence of a permanent stratum of rich peasant-farmers was counteracted by inheritance customs. Partible inheritance was, as a rule, applied more rigorously on the larger peasant farms, because, especially before the middle of the 19th century, it was considered more prestigious too give land to several heirs -- as long as the new farms were large enough to be economically viable -- than to let a sole inheritor take over a large, undivided farm. If, on the other hand, the farm was judged too small to be divided, further division was, as a rule, counteracted by the custom of letting one of the inheritors buy the others off which was usual on small and medium-sized farms.49

Investments in livestock?

Investment in livestock in the sense of giving priority to animal production so that animal stock increased or yielded more, was scarcely to be found among peasant farmers before c. 1860. During long parts of the period 1500-1800 the long-time trend in production and diet was vegetabilization.50 Furthermore, it was difficult for the individual peasant-farmer to carry


50 For prices, see Jörberg 1972,II, 3, 14-15 (the period 1732-1800). For diet, see Morell 2011, 188.
through a prioritizing on cattle raising since the size of the farmer’s animal stock was determined by his supply of winter fodder which is to say meadow. In turn, the farmer’s possession of meadow was determined by his share of the village lands or the homestead. There seems to have been a long-run decrease in the number of animals before c. 1800 which turned to an increase by c. 1850, by which time (or a little later) farmers also obtained new breeds of cattle. But, as we shall see, this was at a time when the open field systems were dissolved at a rapid pace. ⁵¹

Circumstances were different of the manors, however. Manors had, as a rule, much more meadow relative to their arable than the peasants, and animal production (which usually paid better than arable) was relatively more important on the manors. ⁵²

Did tenures and other dimensions of land-holding impact on field division?

In cases when demesnes or other farms under the direct management of people of rank (ståndspersoner) were enclosed, they sometimes had field systems different from villages in their vicinity. Especially in the areas where the normal field system on peasant land was continuous cropping, it often happened that demesnes and vicarages (clergymen stationed in the countryside, as rule, held land as a part of their pay) had used a three-field systems on their enclosed land. Big land-owners sometimes had the means to make great investments on their land. South of Bergslagen, it was on demesnes that the first experiments with cultivation of fodder crops took place, in the second half of the 18th century.

When it comes to land farmed by peasants signs that tenures and other dimensions of land holding had an impact on field division.

In her study of northern Småland, Vestbō-Franzén found that noble landowners (which class, by 1700, owned about a quarter of Swedish land, mostly in the form of tenant farms) did not exert any noticeable influence on the field system of their tenant farms. Each noble land

⁵¹ Gadd 2000, 315-318.

owner, as a rule, had many tenant farms dispersed over a large area, each farm lying in a village or hamlet that, as a rule, also contained farms owned by other categories, most important among them freehold peasants. The nobility’s tenants used the same field system as the other peasant-farmers of the village where they lived. To all appearances it was the local peasant-farmers who took the decision when the field system was changed from continuous cropping to the three-field system.53

Why the subdivision of fields into strips?

Everywhere where open-field systems have been used, the fields have been subdivided into strips or parcels, and the shape of these strips has been long and narrow. This applies also to Scandinavia. In the Scanian village of Lilla Uppåkra (figure 3) we find strips 100-500 meters long and about 25 meters broad. Why these long and narrow strips? The long plough-teams necessary on the often heavy soils of northwestern Europe has been mentioned as a reason. No doubt the difficulty of turning the very long plough-teams must have had a great impact on the shape of strips. But the system with long and narrow strips was used in Eastern Sweden, too. In Östra Nederlösa (which was a fairly normal East-Swedish village) the strips were up to 150 meters long and 25 meters broad. Eastern Sweden was an area where ards were the only plough implements up to the early 19th century, and these ards (different from the wheel ards of Skåne and Denmark) had only one pair of draught animals. Also in the Falbygden area, where at the introduction of the three-field system the parcels were made more long and narrow than before, ards were used harnessed by one or two beasts of burden.

Co-aration? - It has sometimes been suggested that the division into strips would have facilitated co-aration, in which peasants co-operated, forming teams of oxen owned by different owners. However, systematic cooperation with respect to draught animals in current works (as different from investment works such clearing land with very big ploughs) was unusual in Scandinavia. Most Swedish and Danish peasant farmers seem to have owned the beasts of burden necessary for their own needs. In the 1750s, in the most cultivated parts of Skåne, where long plough teams was the norm, peasant farmers had, on average, 6 adult

horses, one young horse and 1-2 oxen, but only 1-2 cows and 1 heifer. South of Lake Vänern were used foot ploughs harnessed with teams of 2-6 pairs of beast and the average peasant had 2 horses, 2 oxen, 4 cows and 1-2 heifers. In the plains of Uppland, between Stockholm and Uppsala, where ards harnessed by two horses were used, peasants had, on average, 4 adult horses and often a young horse, 4 cows an 1-2 heifers. No doubt, Scandinavian peasant farmers had a large number of draught animals in proportion to their relatively small arable acreages. This is explained partly by the shortness of the seasons for ploughing and harrowing. If the Scandinavian practice, short seasons for tilling meant that each farmer had to own or command a number of animals sufficient for the tilling of his own fields.54

Risk reduction and extending the seasons for agricultural work? – A theory presented by D. McCloskey suggests that by having strips in different parts of the village farmland, the individual peasant reduced his risk of crop failure, because usually the quantity of the harvest varied more across the village’s total acreage than it would have done across a single farm with consolidated arable.55

S. Fenoaltea pointed out, that over a large area, the soil gets ready for tilling at somewhat different times and crops ripen at different times during a spring or autumn. By having its strips located to different parts of the village’s total farmland the individual household could therefore extend its seasons for productive agricultural work.56

Both these theories seem to have an explanatory value. There exists at least one statement from Sweden that praises the advantages for a village to have its arable situated at different altitudes, “because such an uneven situation involves … the advantage that here is never complete crop failure. In dry years, the dells must yield, in wet years, the hills”.57 True, it is not the actual division into strips that is praised, but the fact that the arable of the whole village is situated on different levels. However, for all the peasant farmers of the village to benefit from this advantage, strip division was a precondition.

54 Gadd 2000, 168-70.
55 McCloskey ####
56 Fenoaltea ####
57 Quotation from 1811 in Gadd 2005, 75.
But how important were these assumed benefits for the sub-division into strips? Were they solid reasons for such subdivision or were they relatively unimportant advantages that helped the farmers to accept or even appreciate a subdivision that had been carried out for other reasons? At this point of the discussion there seems to be a reason to go back to the research that has been done on the transition from continuous cropping to the three-field system in Falbygden and northern Småland.

The increased subdivision into strips at the transition to the tree-field system seems to have been a way of allocating each peasant-farmers arable over the three fields. Evidently, the subdivision was not regarded as a drawback, at least not big enough to motivate actions to reduce subdivision. Maybe there were advantages, but these advantages were not important enough for the peasant-farmers of Karleby in the neighbour parish to increase subdivision and get the strips spread more evenly over the village arable. It is hard to avoid the impression, that the subdivision into strips was regarded as something relatively unimportant. If it had come into existence, it was tolerated, maybe even appreciated, but it was noting that was strongly aimed at.

Large scale grazing? – It has been pointed out by C.J Dahlman that it Vid treskiftets införande kommer mer åker att odlas upp för it had great economic advantages to let the animals of the village graze in common. According to Dahlman’s original theory this would explain the subdivision into strips through preventing that village members withdrew from village cooperation with respect to fencing. While this latter part of the theory seems somewhat far-fetched, Dahlman’s emphasizing of the reciprocal dependence between arable and livestock farming and the great economic advantages of cooperation on fencing (or herding of the animals) seems highly useful (see, e.g. the discussion above on the changeover from continuous cropping to three-course rotation).

WHY WERE THE STRIP-CONSOLIDATION (“ENCLOSURE”) REFORMS CARRIED THROUGH?

Between c. 1750-1880, Sweden and Denmark experienced far-reaching consolidations of strips, similar in scope to the British enclosures. In Denmark most of this radical reform was carried through c. 1780-1810. In Sweden the reforms were implemented more in a step-by-
step manner. First in order came the *storskifte* reform, ca 1750-1810, in which the fragmentation of village fields was reduced by giving each farmer fewer and larger strips while the established division into large, fenced fields was maintained. Between about 1800 -- 1880 the *enskifte* and *laga skifte* reforms were carried out, in which each farmer got one coherent block of arable land (and a few other blocks consisting e.g. of forest) in a way that reminds of the British enclosures.58

I will not even try to make a complete appraisal of the reason for the reforms here. However, it should be observed that the fragmentation of village fields was just one of several negative elements that were pointed out by writers of that time. Another negative consequence of the open-field system was that peasant farmers in large villages saw the distance to their outer fields getting ever longer.

New implements such as iron ploughs, new harrows and the use of the scythe in harvest may have made the limited size of the strips more cumbersome. Furthermore, the increase in population and in “commercial pressure” on resources, not least the timber resources of the outlying lands increased the tendency towards over-exploitation which created a need for more closely defined property rights.

If, indeed, strip division was a way of reducing the risks of total drop failure, it was a relatively expensive way of risk reduction. In time other alternatives had developed, not least when improved communications lowered the cost for transporting grain from surplus areas to shortfall areas. Furthermore, the 18th century brought about a better economic situation for the Scandinavian peasant farmers. Around 1800, it was therefore much more possible than it had been in the Middle Ages or the 17th century to accumulate savings that could be exchanged for grain in bad years. If it had been important for the individual household to prolong its period of productive work through moving between different parts of the village arable when the land was ready to be work (Fenoaltea), the importance of this was reduced when the number of agricultural labourers grew. Instead of moving the households’ workforces

58 Gadd 2011.
between different parts of the arable, wage labourers were, to put it simply, gradually moving from farm to farm.\textsuperscript{59}

\textit{Grain-grass rotations and consolidation of strips}

The wish to cultivate fodder plants was one important reason to carry through the consolidation of strips. On the demesnes and other large farms grain-grass rotations had been experimented with since at least the 1770s, and these rotations were fairly common on big farms by the 1840s. On peasant farms, on the other hand, fully-fledged grain-grass rotations were unusual by then, except in the mining area (Bergslagen; which was outside of the open-fields areas) and maybe parts of the Skåne plains, which had undergone radical consolidations of strips (enskifte) in the two first decades of the 19\textsuperscript{th} century. After c. 1850 the new crop rotations were adopted more generally on peasant farms, albeit with considerable regional differences. One important reason for the peasant-farmer’s relative lateness in adopting the new rotations was their villages usually had to go through a laga skifte reform before the new rotations could be introduced, since the several successive years of sown leys typical of the new rotations were virtually impossible to introduce in a village using a traditional open-field system was used.

By the middle of the 19th century, several writers saw a laga skifte reform as a precondition for the introduction of a grain-grass rotation Hypothetically, it may seem possible for a whole village to have changed to such a system, but in practice this would have led to negotiations that were extremely hard to carry through. Consequently, there are no examples that a collective change of that kind has been accomplished, more than the half-measures described earlier I which one-year clover plantations were sown in the fallow field. The individualized decision-making that was made possible by the consolidation of strips was decisive for the change to grain-grass rotations.

\textsuperscript{59} Gadd, 2000, 2011.
Figure 1. Field systems of Denmark, 1682-1683. 
Source: Frandsen, 1983.
Figure 2. Field systems of Sweden, c. 1600.

Source: Myrdal 2011, 85.
Figure 3. Lilla Uppåkra, SW Skåne, 1703.

Source: Gadd 2000, 123; Gadd 2005, 41.
Figure 4. Östra Nederlösa, province of Östergötland, East-Central Sweden. This compilation of a surveyor’s map shows the village’s arable, meadows and pastureland. The regularity of the strips, ordered according to the solskifte principle are striking when compared to the apparent randomness that characterize the fields of Norra Hasslösa and Segerstad in Western Sweden (figures ### and ###). In reality the number of strips was greater than the map indicates, since the surveyor has mapped the strips of three of the homesteads as continuous pieces of land.

Source: Gadd 2000, 121; Gadd 2011 127.
Figure 5. Norra Haslösa, Kinnefjärding hundred, County of Skaraborg, 1723 – a two-field system, but in many respects different from that of East-Central Sweden.

Figure 6. Land-use in Norra Hasslös (cf. Figure 5).
Åker=arable
Inhägnad äng och hage=enclosed meadow and pasture
Ena året äng andra året betesmark=land used as meadow one year, as common pasture the other year.
Lönsboda in the parish of Örkened in the woodlands of northern Skåne, 1696. Hard by the hamlet were two fenced fields – one a meadow-field, the other a mix of arable and meadowland – while the swidden was also fairly close by. Within the boundaries of Lönsboda were also the parish church and a water-mill.

**Figure 7.** Lönsboda, northern Skåne.
Source: Gadd 2000 124-125; Gadd 2011, 129.
Figure 9. Part of western Falbygden, a continuous-cropping area, c. 1640.
Slanted lines=arble; Dotted areas=meadow; grass indications=common pasture.
Source: Lindgren 1939.
Figure 10. Segerstad, eastern Falbygden. A three-field village.

Source: Gadd 2000, 118; Gadd 2011, 125
**Figure 11.** The four maps show how the grazing was managed in Segerstad. A three-course rotation was used, so every year one of the three arable fields was left fallow. In addition to the outlying land, where the animals roamed through the summer, that year’s fallow field was grazed in spring and summer. In the late summer, after the haymaking, the meadow-field was also grazed. In autumn the two arable fields in crop was harvested and then grazed, while the fallow-field was cleared of animals ready for sowing. The next spring one of the previous year’s cropped fields became the new fallow-field, to be grazed in spring and summer.

Source: Gadd 2000, 118-119; Gadd 2011, 125.
Figure 12. The arable fields of Karleby, one of the largest villages in the continuous-cropping area of western Falbygden, c. 1640. The parcels of farms nr 2 and 23 are indicated. Source: Sporrong 1970, 26.
Figure 13. The arable of Åsle a village in the Falbygden three-field area, 1640.
Figure 14. The infields (arable and meadow) of Åsle, a three-field village, c. 1640.
Source: Lindgren 1939.
**Figure 15.** The hamlet of Bogla, Östra härad, Småland, 1645. The hamlet consists of three homesteads, the arable belonging to each farm indicated in black, shaded and dots, respectively. Tree fields with tree-course rotation in SW, but two of the farms hold separately fenced arable further to the North-East. The houses seem to have been moved to their present place not long before the survey map was made.

Source: Vestbő-Franzén, 2005, 81.