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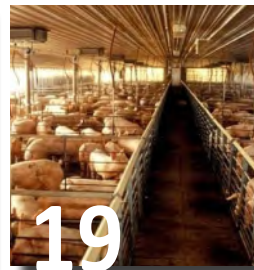
50 TIPS FOR PROFITABLE BEEF PRODUCTION BUSINESS

- A GUIDE TO PIG PRODUCTION
- A GUIDE TO VALUE ADDITION
- PAPRIKA PRODUCTION GUIDE
- TOP TEN CONSIDERATIONS FOR SMALL-SCALE BEEF PRODUCTION
- CAREFUL SOIL SAMPLING—THE KEY TO A RELIABLE SOIL TEST
- BASIC PIG HUSBANDRY - THE BOAR





In this Issue



- 04 **Livestock**
50 Tips for Profitable Beef Production Business
- 09 **Livestock**
Top Ten Considerations for Small-scale Beef Production
- 15 **Livestock**
A guide to Pig Production
- 19 **Livestock**
Basic Pig Husbandry - The Boar
- 27 **Crops**
Crop planting calendar
- 28 **Crops**
Careful Soil Sampling—The Key to a Reliable Soil Test
- 31 **Crops**
Liming: Why Important?
- 33 **Crops**
Paprika Production Guide
- 39 **Agribusiness**
A Guide to Value Addition
- 46 **The Agri Expert Answers**
Q & A.
- 47 **Games**
Word Search & Spot the Difference

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50 Tips for Profitable Beef Production Business

The combination of high cattle prices and high input prices does not necessarily mean that beef cattle producers will be profitable. It takes wise investments, careful expenditures, and strategic marketing to be in the black. Good management must happen in many different production, marketing, and financial aspects. Fifty profit tips for beef cattle producers are presented here for consideration.

1.

Take advantage of hybrid vigor. Crossbreed.

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2.

Pay the extra money for a good bull. You will get it back several-fold when it comes time to market your calves.

3.

Learn how to use EPDs. Then use them for every herd sire or registered female purchase and mating decision.

4.

Pregnancy check cows within a month or two of the end of breeding. Do not let open cows

run up a tab that they cannot pay.

5.

Work with a good veterinarian. Be straight with your vet when he or she asks questions about your management practices. Your vet is trying to provide your cattle with the best health care possible and needs your cooperation in this process.

6.

Vaccinate your cattle. The dollars and cents behind this recommendation are clear: 2 doses of blackleg vaccine =

....continued on page 6



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....continued from page 4

less than \$2 per calf; 1 case of blackleg = 1 dead calf that could have brought \$700 or more at weaning

7.

Observe cattle frequently and closely.

8.

Treat cattle injuries and disease conditions promptly.

9.

When dealing with death loss, do not wait until the umpteenth animal is lost to have a necropsy performed. Track down the cause of death as soon as possible.

10.

Parasites are thieves. Deworm your cattle. Control the flies.

11.

Know how to identify plants poisonous to cattle.

12.

Take time when laying out fencelines, water sources, and facility locations.

13.

Maintain your fences.

14.

Invest in decent cattle

handling facilities. This is one of the best things you will ever do on your operation.

15.

Livestock scales are invaluable. Use them often.

16.

Handle your cattle with care. It is important for safety and productivity, and you never know who might be watching.

17.

A fast horse is nice. A fast cow is trouble. Cull the crazy cattle.

18.

Keep safety as the top priority in everything on the farm.

19.

Look into getting farm liability insurance.

20.

Be a good steward of your natural resources.

21.

Soil test. Fertilizer is too expensive to put out blindly. Target your nutrient applications.

22.

Use management intensive grazing techniques to get the most out of your pasture.

23.

Develop a forage supply and demand budget. Then adjust your forage production and stocking rates accordingly.

24.

Whether grazing or haying, do not let your forage become too mature. The nutritional value tanks when this happens.



25.

Know your hay quality, and supplement accordingly.

26.

Manage body condition for good reproductive success. A thin herd produces fewer calves.

27.

A white salt block is not a complete mineral nutrition program. Supplement minerals and vitamins properly.

28.

Avoid grain overload and other nutritional nightmares with good feeding management.

29.

Implants and ionophores are proven to be great investments. Use them when appropriate.

30.

Castrate feeder calves to avoid the intact bull calf discount.

31.

Take the horns off of feeder calves. Horns lead to bruises, other injuries, and discounts.

32.

There is power in numbers. Pool resources with your neighbors. Group labor, input purchasing, and cattle

marketing are some areas where this can be beneficial.

33.

Develop and grow a good business reputation.

34.

Network. Good business relationships can make all the difference in profitability.

35.

At least use a record keeping book, if not a record keeping computer software program.

36.

Use electronic and information technology to your benefit.

37.

Put a pencil to your farm finances. Know your expenses and income. Budget ahead.

38.

Keep all your farm receipts for tax time.

39.

Pay your bills on time to avoid late fees and interest.

40.

Shop around for inputs.

41.

Beware of "silver bullet" products. Make



sure they are backed by sound, unbiased science.

42.

Buy feed by the truckload instead of by the sackful.

43.

Support the local economy with your cattle business dealings. It keeps more local doors open, jobs active, and potential customers buying.

44.

Know when to get rid of equipment and other

assets that become a money pit.

45.

Promote your product.

46.

When you are not sure about something in the cattle operation, starting asking questions. Try to get the information you need before you need it.

47.

Do not overextend your resources. This leads to less than optimum management, undue stress, and sometimes financial difficulties.

48.

Implement management practices properly to get the intended result. For example,

a poor effort of heat detection can ruin a breeding program.

49.

Do not be afraid to change. Adapt your management and marketing practices and strategies with the times.

50.

Never stop learning about the cattle business. New knowledge is created all the time, and for many, there is still plenty of old knowledge to master.

This list of profit tips is by no means a complete list of recommended practices. To make improvements to the bottom line of a beef cattle operation, be thorough in analyzing

and planning all aspects of the operation. For more information about beef cattle production, contact an office of the Mississippi State University Extension Service. Source: Jane Parish – Extension Beef Cattle Specialist, Mississippi State University





Top Ten Considerations for Small-scale Beef Production

Beef cattle production can be a viable option for small farms. Livestock enterprises, such as beef cattle production, can diversify farming operations and complement many other farm enterprises. As ruminants, beef cattle can utilize a variety of feedstuffs and can graze forages from marginal land that is better suited for grass production versus cash crop production. Ruminants have the ability to convert forages indigestible to many species into valuable, nutritious beef. There are many components to successfully

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raising beef cattle, some of which may take some extra consideration for small-scale production. Here are some key considerations for small-scale beef production.

What are your resources?

Think about the land, feed, equipment, facilities, labor, etc. that will be required for a beef cattle operation. Land availability and feed resources are often limiting factors. In terms of equipment, think

about trailers, feeders, waterers, chutes, calving pens, wagons, etc. Many of these items can be purchased used at farm sales. Perhaps you have some of the items already that you are using in other farming enterprises. Fencing and shelter would be big upfront facility expenses.

What is your knowledge level?

How comfortable are you with animal health, nutrition, reproduction, well-being, etc.? For

....continued on page 11




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....continued from page 9

beginner producers there are many quality educational programs available. Work with veterinarians, nutritionists, experienced producers, extension specialists, etc. to find the educational resources that you need.

What would a budget look like for your cattle operation?

Working through an itemized enterprise budget can help you identify all the potential costs and potential incomes. Many land grant university extension programs have farm management specialists and online budgeting tools that can help you with this process. Production costs can vary tremendously farm to farm and income can vary significantly depending on numerous production and market variables. Profit margins are sometimes narrow. Budgeting effectively can help to identify areas of potential improvement.

What sector of the beef industry is the best fit for you?

The beef industry can be broadly divided into cow-calf production



and feedlot production. Cow-calf operations manage breeding herds to produce new offspring every year. Feedlot operations feed those offspring to market weight and sell them to be processed into retail beef.

There are also stocker / backgrounder operations that specialize in feeding weaned feeder cattle to a certain point before selling to feedlot operators. There are, of course, many variations and combinations of these sectors.

Some cow-calf producers retain ownership and feed their own

cattle to market weight, essentially operating cow-calf and feedlot operations. Seed stock producers raise breeding stock for commercial cow-calf producers; and club calf producers raise show stock for 4-H and FFA exhibitors. Think through a marketing plan and determine which sector of the industry would make the most sense for you.

How might you add value?

As a small player in the commercial commodity market, you will be very much at the mercy of the cattle market. Sometimes, small cattle

farms are well positioned to take advantage of niche markets that may add value to their cattle.

There is growing demand for natural, organic, source verified, grass-fed, etc. products that can be sold directly as freezer or locker beef. Some small producers use farmers markets to gain exposure and build clientele. Perhaps you are interested in beef cattle genetics of a particular breed and you would like to pursue seedstock production.

Even if you choose to market weaned calves as commodity feeder calves, there may be ways to add value. Because small lots are sometimes at a disadvantage marketing through auction markets, you might look into direct marketing to a cattle feeder, combining lots with other small producers, or retaining ownership through a custom cattle feeder.

What production system would work best for you?

Production systems vary based on region, climate, resources, and many other factors. In the Midwest, the most common system has historically been spring-calving



cows that graze pasture during the growing season and consume hay, silage, grain, and other stored feeds during the winter. Numerous variations of this system that can work well. In some areas, grazing crop residue and stockpiled forages can extend the grazing season dramatically.

Alternatively, there is growing interest in dry lot and confinement production of beef cattle. There are many ways successfully raise beef cattle.

When is your calving season?

Calving season is an important component of your production system. It is usually best to have a short, defined calving season to produce a group of calves that are similar in age and weight. Although,

most herds calve in the spring, you can establish your calving season (and associated breeding season) to be whenever you would like.

There are many factors to consider and there is no perfect answer to the question of when to calve. Plan your calving season considering labor availability, weather, facilities, feed availability, marketing plan, etc.

What is your breeding plan?

Bulls are incredibly important to your breeding operation. They are responsible for breeding multiple females and thus affect not only pregnancy rates but contribute greatly to the genetics of your calf crop. For example, if you have one bull and twenty cows, each calf gets half of his/her DNA from that single bull. Bulls are also

expensive. It is easier to justify spending a lot of money on a bull if you can spread that cost out over many cows. (One mature bull should easily be able to cover 25-30 cows in most situations.) It becomes more challenging however to justify the cost of an expensive bull for a lesser number of cows. Artificial insemination (AI) is an option but requires a clean-up bull to breed those that do not settle through AI. It may be worth considering leasing agreements, partnerships, and other creative arrangements to acquire your bull power. Think not only about cost but also about biosecurity and genetics as you make bull decisions.

What are your feed resources?

Feed is probably the most important input for a beef cattle operation. Adequate nutrition is critical to the health, well-being, and productivity of your cattle. Feed cost is the biggest cost of a cattle operation and often the number one factor in determining profitability. You must feed cattle well-balanced rations but do it in an affordable manner. Plan for adverse weather events such as drought, flood, cold stress, etc. It

is often wise to have a back-up supply of feed on hand.

What are your talents and interests as they relate to beef cattle production?

What aspects of cattle production do you find interesting? What aspects of cattle production do you enjoy? You are much more likely to be successful if you are interested in and passionate about what you are doing.

Christopher Clark
Southwest Beef Field Specialist
Iowa State University Extension
and Outreach



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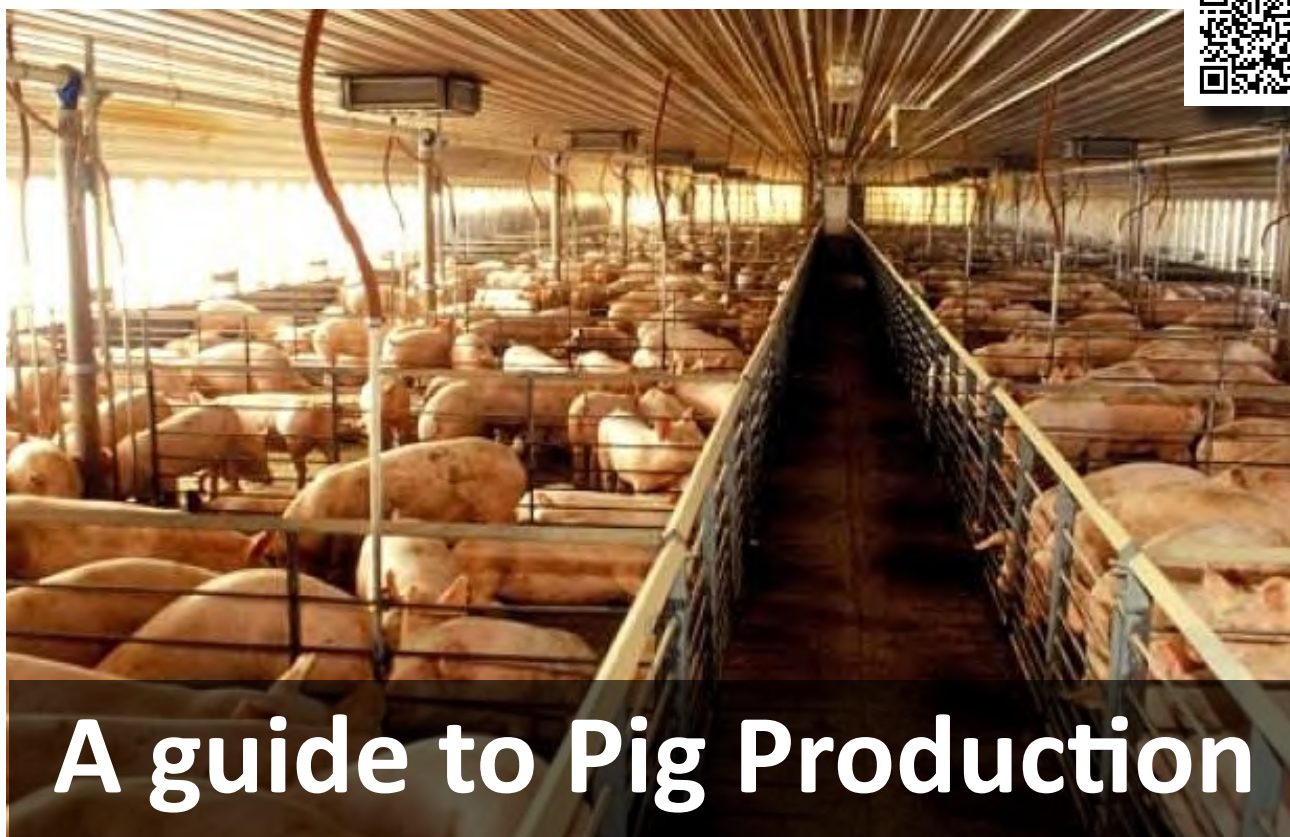
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A guide to Pig Production

Having established a good pig house, known the source of feed for your pigs and finally stocked with a pig breed of choice it's all systems go. Next step is to identify a qualified vet who will provide you with clinical services. Pigs, like poultry, are affected by viral diseases that can wipe a whole stock. The first step towards having a healthy herd is getting a boar (male pig) with superior qualities, which will in turn transfer these desirable qualities to their offspring.

A reproductively sound boar should be selected from the best parents. Such should have exhibited high feed conversion rates, high weaning rates and high reproductive potential. This selection should be done before castration which is usually done

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by the time the animal is four weeks old. Other desirable characteristics of the boar should include sound feet with good, full hams, uniform curve at the back and good body length.

Boar should be selected from the herd with normal sex organs and should be active, healthy and strong. A boar selected under these criteria must be at least 8 months old at first service. Mating routine Once a farmer is assured of a boar with top desired characteristics, sows (female pig) must be carefully observed for heat so that no service is skipped.

Signs that a pig is on heat

are restlessness, reddened and swollen vulva with white mucus discharge which later turns slimy.

Like cows, sows or gilts on heat tend to mount and be mounted by others.

The most specific indicator of heat and readiness for service is when the sow or gilt stands still when pressure is applied to her back (standing heat).

More commonly, a sow may delay coming on heat and this is usually after farrowing. To bring the sow to heat, spray the sow's (or gilt's) pen with boar urine every morning for three to five days.

Bring the sow to the boar, or place the sow in a pen next

....continued on page 17

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....continued from page 15

to the boar or put the sow together with the boar for a short period every day when the heat is expected. Always take the sow to the boar as this activity makes the sow smell the characteristic boar smell which stimulates heat.

Early weaning at 4 to 6 weeks also helps a sow return to heat fast. During standing heat period which lasts 24 hours, allow the boar to serve twice at an interval of about 12 to 14 hours. Do not mate animals during the hot time of day as it's stressful. Young boars may need assistance in alignment during mating. When aiding in this process, ensure your hands are clean and nails short. If conception is not successful, the sow will return on heat again in about three weeks.

It is usually advisable to increase feed by 1 – 2 kg per day since it is a stressing period with increased activity for the sow. In case of successful pregnancy, it is good practice to, give 0.5 kg extra feed per day in the last trimester but decrease this gradually one week before farrowing.

Provide plenty of water to help prevent congested gut during farrowing. Failure of conception can be due to various factors including if the sow is too fat, gilt in her first heat cycle, immature



boars and in some cases when the boar is overworked (used for more than five matings a week).

Care and management of new born piglets

Soon after birth, the umbilical cord must be snapped off at approximately 5 cm from the body. It should then be dipped in iodine to prevent infections that lead to tetanus. Assist the piglets to begin suckling immediately.

Colostrum intake boosts the young animal's immunity, thus all piglets should suckle sufficiently within the first 12 to 24 hours of life. Sometimes when piglets are many, they can be supplemented with goat or cow milk. Piglets are usually born with needle sharp teeth that can injure the sow udder. These have to be trimmed on day one it must be done by skilled personnel to avoid injury to the piglet.

Days after birth, piglets suffer from iron deficiency anaemia and therefore have to be supplemented orally within 24 to 48 hours after birth or by iron injections.

Male piglets are castrated within the first two weeks to prevent their meat from having the boar taint. Castration also makes them more manageable when they become sexually mature. Note that castration equipment must also be clean and after castration, the wound must be disinfected to prevent infections. To reduce cases of cannibalism where piglets bite their tails, the body part can be cut by day four.

To avoid this habit, chains can be hung in the shed for the pigs to bite when the urge comes. To keep the piglets warm especially during the cold weather, infrared bulbs come in handy. To ensure more litter from

a sow in a year, encourage early weaning from two weeks but this must be accompanied by provision of quality balanced nutrients.

Common pig diseases and parasites

Now that you have your piglets, the next thing you need to look out for is pig diseases. To avoid disease incidences, it is important to have a clean house, quality feed and ensure general wellness of the pigs. As expected, even after taking all the biosecurity measures, the animals may still get sick because of other factors.

Common signs of ill health in pigs include reduced appetite, rapid breathing, indication of a fever, in white skin-coloured pigs the skin may become reddish or bluish. Depending on the system affected some pigs may have diarrhoea which may be bloody. Droopy ears or ears pointing downwards, dull eyes are also indicative of sick pigs. To be on the safe side, always call a vet when you spot these symptoms. –

The writer is a veterinarian surgeon based at the University of Nairobi





Basic Pig Husbandry - The Boar

By Graeme Taylor and Greg Roese

So far as overall improvement is concerned, a boar has far more influence in a herd than the average sow. Because a boar has such a tremendous influence within a herd, careful consideration should be given to his selection, management and replacement.

On many farms productivity and profitability are reduced because too little consideration is given to developing a suitable breeding program to utilize boars to their full potential.

Selection of boars

A boar must possess both the genetic potential to improve the performance

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of his progeny, and the physical soundness to remain an active breeder. Final selection for young boars can be carried out when they complete their performance testing between 20 and 30 weeks of age.

Production performance

The production characters of growth rate and carcass quality are of intermediate to high heritability, and a high proportion of the boar's superiority will be displayed in his offspring.

However, it is unwise

to purchase boars from apparently superior herds that are not performance tested. Ask to see the boar's performance test results and check them against other boars in the same test group — better still if there are estimated breeding values (EBVs) available for the boars.

Otherwise, differences in performance could be due to non-genetic effects like environmental factors and these cannot be passed onto a boar's progeny. Cross-herd evaluations of sire lines are also available.

It is also inadvisable to obtain boars from herds of less than 60–80 sows, even if they undertake performance testing. It is more desirable to buy

tested boars from large herds or breeding companies using programs like PIGBLUP that can employ enough selection pressure to identify superior animals and maintain rapid genetic progress.

Health status

The introduction of diseased stock poses the biggest threat to the herd's current health status. Boars should only be brought in from known healthy herds, and where possible some guarantee obtained as to their freedom from certain diseases, or parasites. A disease outbreak could cause unnecessary hardship and serious economic loss. Ask your veterinary practitioner to liaise with the breeding company to compare your health status. A period of quarantine (4–6 weeks) and acclimatisation provides insurance against new diseases being introduced and allows new boars to be exposed and gain immunity to diseases on your unit. Consult your veterinary practitioner for development of a suitable program.

Conformation and physical soundness

Particular attention should be given to the boar's legs and feet as they are subjected to considerable strain during mating. Any sign of weakness at this early age could signal a serious problem at a later date.

Make sure that his toes and pasterns are not long, weak or misshapen. When he walks, he should move freely, without any sign of stiffness or lameness. The testes should be normal in shape and size, even, and free from defects. While the width of the testes is directly related to total sperm output, it is not a true indication of the libido or sexual activity of the boar.

Physical contact

Recent research has shown that up to about 30 weeks of age, young boars need contact, particularly physical contact, with other pigs in order to develop high serving performance. After puberty, it is important to house boars near female pigs to maintain courting and serving behaviour. These females can be either oestrus or non-oestrus gilts or sows but must be housed next to the boar pen.

Boar sow ratio

This is usually one boar per 20 sows with supervised hand matings, but in small herds or under extensive conditions, the ratio could be between 15 and 18 sows per boar. This is only a guide for determining the number of boars required. Actual boar requirements would have to be determined for each herd, based on the number of sows to be mated in a given period and the boar's replacement age.

Where double or triple matings are practiced, boar requirements are based on the number of sows to be mated per week. With batch farrowing the number of boars required will depend on the batch sizes selected.

Obviously where artificial insemination is utilized, fewer boars are required.

Mating management

While the age at which a young boar can first be used varies between breeds and individuals, the general rule is that a young boar should not be used for service until he is at least 28–30

weeks of age. Boars used at too early an age may have their working life considerably shortened and their breeding ability impaired.

Training a new boar

Many breeding difficulties associated with boars can be directly attributed to lack of care and attention at their first matings. The aim is to teach the boar as quickly as possible that the reward for courting and mounting is mating. These first services are critical in the formation of a boar's mating behaviour.

Confidence

The development of a young boar's confidence is vital. Intimidation by a group of gilts or sows, or even an attack by a large sow can be a devastating experience for a young boar. Reluctance to work is the usual result. To develop his confidence a gilt or preferably a small quiet sow, of similar size, on 'standing heat' should be used for the first few services. If the gilt or small sow does not stand for the boar it can lead to frustration, injury or disinclination to work. Boars reluctant to



work or lacking libido are a nuisance. They upset mating programs, resulting in the overuse of other boars or the need to run extra boars.

Bad habits

Supervision of mating is necessary to overcome or prevent the development of abnormal behaviour. Often when young boars are run together they develop bad habits. The most common is serving into the rectum. At his first services, ensure that vaginal entry takes place. It is not uncommon for a young boar to mount the front end of a sow, as the head is lower and easier to mount. This is particularly noticeable when he attempts to mate sows larger than himself.

Other, less common

behaviour such as masturbation do occur, and where boars continue these habits, they should be culled. Boars may have been isolated from females during the testing period and they will require a period of adjustment and social contact with females prior to being worked. Conditions in the mating area will also affect his confidence and the development or suppression of abnormal behaviour.

Physical disorders

There are several disorders seen in the boar which prevent erection and/or complete penetration at mating time. Penile adhesions are not uncommon and accidents can cause fracture of the penis. These conditions can only be

observed at mating time; therefore, supervision and observation of mating is essential in early detection of these disorders. Breeding companies often undertake a serving check of young boars prior to sale and they will normally provide some guarantee of replacement if a boar fails to perform.

Time of mating

Mating is best carried out in the early morning before feeding. Serving on a full stomach can impose unnecessary strain. Also, the boar is more active in the early morning, particularly during hot weather. The actual number of services and their timing is dictated by whether oestrus detection is carried out once or twice daily. Two services 12–18 hours apart usually give better results than either a double service 24 hours apart, or a single service. Triple services can be used if litter size is considered to be low. Plan the third mating for about 12 hours after the second.

Mating routine

It is preferable to take the sow to the boar, as she normally assumes

the major role in searching out the male. This initial contact is important in replacing the social contact behaviour with the sexual behaviour sequence.

Also, shifting the boar can excite him and make him difficult to control. However, if a specialised mating pen is made available, the boar will become accustomed to the routine, but ensure that the boar is placed in the pen and the sow is brought to him. Service crates can be used where small sows or gilts have to be mated to a much heavier boar, but their success varies and depends a good deal on the attitude of the boar.

Mating behaviour

When a sow is introduced to a boar, the boar will approach her, emitting characteristic grunts. She may run from him and he will follow, continuing to grunt, grinding his teeth and producing foaming saliva. He may urinate frequently. He attempts to make contact with her and if she stops he may nose her flank quite forcefully, sniff the ano-genital region and her head, and then attempt to mount.

If the sow responds by adopting the mating stance (standing immobile, back arched with ears cocked), it is a signal to the boar that she is receptive and he will mount and copulation will occur. Ejaculation is signaled by tightening and relaxing of the anal sphincter and should last at least 3 minutes. If any less than that, the mating should be considered doubtful. The boar signals the end of copulation by dismounting.

Supervision

Assistance at mating is seldom necessary but it is important that they be supervised to ensure that a satisfactory service does occur. When the sow is introduced to a boar and it is obvious that she will not stand, she should be removed as quickly and quietly as possible. It is not advisable to leave a sow unattended with the boar. There is the risk of causing serious injury to a sow especially with a very aggressive boar. Correct management of a boar is more important than for any other class of pig. Viciousness in boars is often caused by bad handling and can be a constant source of dan-

ger. Staff should undertake industry training, such as 'Prohand' for the professional handling of pigs. Once a successful service has taken place, the sow should be removed and placed in a pen on her own.

Workload

For the first month and during training, the young boar should be allowed no more than one sow per fortnight, gradually increasing to two sows per week (double service) by the time he is 10–12 months of age. As a boar matures (12 months plus), he could be used on two sows per week (double service) to a maximum of six matings per week. Where possible, he should not be used for more than two consecutive days. It must be made clear that there are individual differences between boars, and their ability to mate sows varies greatly. Stock hands should be aware of this and adjust a boar's workload accordingly. Crossbred boars appear to have a higher serving performance than purebreds. A record of a boar's matings is essential to even out the workload and to detect any drop in fertility. A boar may not

produce viable sperm on the first few services, or for a short period after stress, infection or a long rest period. To reduce the possibility of small litters, a second boar could be used over his first few services. A second boar can also be used to even out the workload.

Boar comfort

While improvements in housing and accommodation have been achieved, the area that has received little attention has been boar accommodation. When an expensive, performance-tested boar breaks down, producers then realize that inadequate accommodation can prove very costly.

Boar pen

If conditions are considered extreme, serious

consideration should be given to providing a strong, well-insulated pen for sleeping and feeding. This can be built adjacent to a central service pen. Because boars are alone in their pens they are particularly prone to the effects of temperature variations. Mature, lean working boars have little fat cover and therefore little protection against the cold. Feeding levels may have to be increased and consideration given to providing bedding or additional warmth during winter. High summer temperatures will also affect boar performance. His libido and general activity are usually affected long before there is an effect on sperm quality. If extremely high temperatures do occur, sperm quality can be affected for up to 6–8 weeks. Provision of cool-



ing is recommended.

Floor surface

This is easily overlooked but there is nothing that will give more trouble than a rough or slippery floor. It is particularly common when the pen is used to house the boar and doubles as a service area. During mating, if the floor surface is slippery, a sow may have difficulty standing for the boar. She could easily slip causing severe injury to herself or to the boar. When a boar mounts a sow, his hind feet are often placed level with or in front of the sow's feet. As he thrusts, he gains leverage from his feet. If he happens to slip, he could easily injure himself. During ejaculation the boar is immobile but if the floor is slippery, he may fail to complete the service and become frustrated.

The floor should be hard and well finished but not slippery. Providing a service area covered with sawdust, rice hulls or similar material provides excellent mating conditions.

Pen shape and size

The service area should be at least 2.5 m × 3

m. It should be free of obstructions and the area should be well lit to allow for easy observation. Gates in particular should be solidly built and made to swing both ways. Circular pens also provide a good service area and work best if placed close to other boars.

Feed requirements

Boars are usually fed between 2.0 and 3.0 kg of a balanced diet containing 0.55% available lysine, and a digestible energy (DE) of 12.5–13.5 megajoules per kilogram (MJ/kg). The amount fed depends on the age, weight and the amount of work the boar is doing. Supplementing the diet with omega-3 fatty acids can improve sperm quality and production, resulting in improved fertilization and litter size. It is important that the boar be kept in a lean working condition and not allowed to become overweight and possibly lazy.

De-tusking

Tusks on a boar are potentially dangerous to the stock hands and the brood sows. The tusk will grow approximately 2 cm every 6 months, so

it is advisable to de-tusk the boar at least once a year. The usual method is to restrain the boar by means of a rope with a running noose over the top half of the snout and behind the molar tusks. By pulling tight and tying close to a post or rail, the boar is then fully controlled. Although bolt cutters could be used they are not recommended as they are difficult to manipulate and invariably shatter the tusk leaving sharp protrusions. The job is best done using surgical wire.

Reluctance to work

A common cause of a reluctance to work is the overuse of a boar or the abuse and overuse of young boars. It is important to emphasise the need to supervise a young boar's first services, to make sure they are successful and that he is in no way injured or frustrated. This initial period will influence his subsequent mating behaviour. Boar mating sheets should be used to keep a record of the services performed by individual boars. Used properly, they should prevent overuse of boars and help detect sterility. Make sure boar pens

are positioned next to newly weaned sow pens, to maintain interest and activity. Pens for young or small boars can be 2.5 m × 2.5 m, rising to 3.0 m × 3.0 m for older and larger boars. An alternative is the use of a detection mating area (DMA) which combines the stalling of boars in large stalls (0.8 m × 3.0 m) with an adjacent mating area.

The service area should be at least 2.5 m × 3 m, with a non-slip surface. With slippery floors, sows may refuse to stand, which frustrates the boar, or he may slip, lose confidence and be reluctant to mount any further sows.

Overfeeding, besides being wasteful, limits the usefulness of a boar and makes him lazy. This can be exaggerated during periods of high temperatures. High temperatures do affect libido and stamina, and provision of wallows, sprinklers or cooling should be provided. Infection or injury can also lead to a reluctance or inability to work. Sore feet and injury to the muscles or ligaments of the back are not uncommon. 'Rest and test' should be the order of the day. Consult

a veterinarian as soon as you have any concerns.

Replacement

The useful working life of a boar can extend to about 3–4 years of age, but by then he becomes too heavy to mate anything but old sows. He is more prone to leg weakness and his breeding ability and value is doubtful. In order to maintain young active boars that are easy to handle, boars should be culled when they reach 2 years of age. As far as genetic progress is concerned, it is more desirable to replace boars when they are 12–18 months of age.

Where possible, boar replacements should be planned in advance. Far too often young boars are brought in and expected to immediately perform like a mature boar.

A settling-in period is essential, particularly when buying in boars. They need time to adjust to the new environment and develop immunities to new disease organisms. In fact, they should be placed in quarantine and exposed to a low grade of infection from the piggery some

3 weeks before being used.

Disease control

If a disease control program is being followed, it is important that the boar be included in any vaccination programs. Likewise, the control of internal and external parasites should include the boar, as he can be a source of reinfection. Consult your veterinarian to develop a suitable health and vaccination program for your boars.

Summary

A boar has a tremendous influence on a farm's productivity and profitability. In order to maximise the herd's performance and throughput, boars should receive careful attention. While a manager may implement a suitable breeding program to utilize boars to their full potential, it is the stockperson who has the greatest impact on how well the boar will perform during his breeding life. By following basic husbandry principles the stockperson will be able to satisfy the boar's requirements and demands of his working life.






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- ✓ Plant tissue analysis for N, P, K, Ca, Cu, Zn etc
- ✓ Stockfeeds
- ✓ Fertilizer, compost and manure analysis
- ✓ Microbiological Evaluation of horticulture produce for export certification
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Crop Planting Calendar (Zimbabwe)

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Beet Root												
Brinjal (egg plant)												
Broccoli												
Butternut												
Cabbage												
Carrots												
Cauliflower												
Chillies												
Green beans												
Green mealies												
Lettuce												
Marrow (baby)												
Onion												
Peas												
Peppers												
Potato												
Squash												
Squash (germ)												
Squash (marrow)												
Tomato												
Water melon												



Careful Soil Sampling—The Key to a Reliable Soil Test

When you submit soil samples for laboratory analysis, you need and expect reliable results. Because the test report is used in making decisions about liming and fertilization, its accuracy can affect your costs and yields. In other words, getting accurate results can make a difference in dollars and cents.

The reliability of the soil test, however, can be no better than the sample you submit. For results you can depend on, it is vitally important that you take samples in a way that accurately represents the soil on your farm.

This article tells how to obtain representative soil samples and to submit

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them for analysis.

Where to Take Samples

You can obtain an aerial photograph of your farm from google maps. Outline your farm or field boundaries directly on the photo or make a larger and more detailed map using the photo as a guide. Then assign a permanent code to each field or management area. Coding the areas will enable you to keep records of the soil treatments applied and the crop yields obtained from each area. For your convenience in submitting soil samples, assign each

area a code consisting of no more than three characters—numbers, letters, or both.

Every soil sample you submit for testing should consist of about 15 to 20 cores taken at random locations throughout one field or area. A sample should include cores from no more than about 20 acres even if the soil appears to be uniform over a larger area.

Keep in mind that each sample should represent only one general soil type or condition. If the field you are sampling contains areas that are obviously different in slope, colour, drainage, and texture and if those areas can be fertilized separately, submit a separate sample (consist-

ing of 15 to 20 cores) for each area (Figure 1).

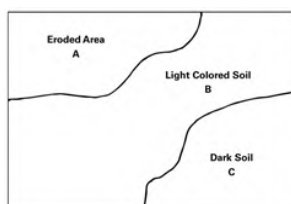


Figure 1. Within each field, collect a separate sample from each area that has a different type of soil.

When collecting samples, avoid small areas where the soil conditions are obviously different from those in the rest of the field—for example, wet spots, old manure and urine spots, places where wood piles have been burned, severely eroded areas, old building sites, fence-rows, spoil banks, and burn-row areas. Also, avoid the fertilizer bands in fields where row crops have been grown. Because samples taken from these locations would not be typical of the soil in the rest of the field, including them could produce misleading results.

Areas within a field where different crops have been grown in the past should be sampled separately, even if you now plan to grow the same crop in the whole

field.

Areas that have been limed and fertilized differently from the rest of the field should also be sampled separately.

Sampling Problem Areas

In fields or areas where fertility problems appear to be the cause of abnormal crop growth, samples should be collected in a somewhat different way from samples used for routine testing.

At the same time you collect topsoil samples, collect subsoil samples at a depth from 20 to 40 centimetres, but keep the two types of samples separate. Follow the guidelines for collecting a good, representative sample, taking cores at random locations throughout the problem area even though it may be relatively small. At the same time, collect a representative sample from normal areas of the same field.

When to Take Samples

Collect samples three to six months before planting time. You will then have the test report in time to plan your liming

and fertilization program before the busy planting season. If you submit samples immediately after harvest in the fall, you are likely to receive the results. If possible, try to collect your samples at the same time every year.

Do not collect samples when the soil is too wet because it will be difficult to mix the cores. As a rule, if the soil is too wet to plough, it is too wet to sample.

Sample the soil from perennial or sod-crop areas three to four months before establishing the crop or applying lime or fertilizer.

How to Collect a Good Sample

Tools. Collect your samples with stainless steel or chrome-plated sampling tools and plastic buckets to avoid contaminating the samples with traces of chemical elements (micronutrients) from the sampling tools. Avoid brass, bronze, or galvanized tools. A suitable soil probe is shown in Figure 2.

Make sure that the buckets and sampling tools are clean and free of lime and fertil-

izer residues. Even a small amount of lime or fertilizer transferred from the sampling tools to the soil can seriously contaminate the sample and produce inaccurate results.

Sampling Depth.

For areas in which field crops are grown, collect samples to the same depth that the field is ploughed because this is the zone in which lime and fertilizer have been incorporated.

For fields when perennial crops such as alfalfa are being maintained, samples taken to a depth of 10cm will best represent the crop's lime and fertilizer needs. Where these perennial crops are to be established, however, sample to the regular plow depth.

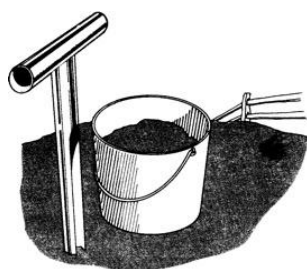


Figure 2. Use proper tools to collect the soil sample.

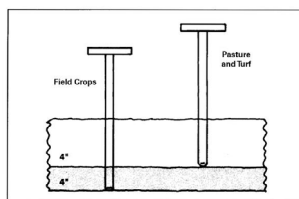


Figure 3. Sample to a depth of 20 cm in fields ploughed for row crops, 10 cm where perennial pasture or turf crops are grown.

Submitting the Sample

Each sample must be submitted in a standard soil sample box and accompanied by a completed form.

Label the box with the code you have assigned to the area sample.

Remember that the identification can consist of no more than five numbers, letters, or a combination of the two.

To get the most value from your soil test, take the time to fill in the blanks completely and be sure to list the crop or crops to be grown. Also check to make sure that the code you put on the form corresponds to the code on the sample box and the farm map.

If you need assistance in interpreting the soil test results or developing a soil treatment plan, con-

sult your local agricultural extension officers.

Adapted from NC State Extension



Liming: Why Important?

Proper liming provides a number of benefits that include:

Nutrient solubility and availability are improved by higher soil pH. Manganese is an example of a micro-nutrient required by plants that becomes less soluble as pH increases. It is available, and can even occur at toxic concentrations, if the pH is too low. It becomes insoluble and unavailable if the pH is too high, and deficiencies can result.

Plants develop healthier roots because they are exposed to reduced toxicity of aluminum and manganese (most piedmont and mountain soils). Better root growth may improve nutrient uptake and enhance drought tolerance.

Lime is an economical source of essential calcium (as well as beneficial magnesium if dolomitic lime-

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stone. Furthermore, these nutrients are released slowly over a period of three to four years and may be better protected from leaching than those supplied by more soluble fertilizers.

Fertilizer phosphorus (P) is used more efficiently. Aluminum at a pH of less than 5.4 is chemically active and combines with fertilizer phosphorus, causing it to become less soluble. Because this fertilizer phosphorus is tied up, less is available to the next crop. In some instances, fertilizer phosphorus inadvertently serves as a liming material by decreasing aluminum solubility.

Increased soil CEC occurs, as well as reduced leaching of basic cations, particularly potassium. The soil CEC includes a number of pH-de-

pendent sites that become available to hold cations as the pH increases. When these sites are occupied by strongly attached aluminum (low pH), any potassium added in fertilizer is more susceptible to leaching. Proper liming will minimize, but not completely prevent, leaching of potassium. Soils with deep sandy surfaces are particularly susceptible.

Nodulation of legumes is enhanced, which improves nitrogen fixation. The bacteria (Rhizobia) in nodules on legume roots (soybeans, peanuts, alfalfa, and clover) synthesize greater amounts of nitrogen from the soil atmosphere for use by the legume in places where soil pH is not too low. Nitrogen fixation provides an economical source of nitrogen and may supply the succeeding crop with substantial residual nitrogen. In addition, molybdenum (Mo), an element essential to Rhizobia in the nitrogen-fixing process,

is increasingly tied up as soil pH of mineral soils gradually declines below 5.5. Therefore, less-than optimum molybdenum levels may result in reduced growth of legumes, such as soybeans, peanuts, and clovers.

Triazine herbicides, such as atrazine and simazine, work better in a higher pH environment.

Some nematicides also may work better.

Optimal pH allows the breakdown of some herbicides, preventing damage to rotational crops.



#agribusinesstalk

Adapted from NC State Extension





Paprika Production Guide

Paprika (capsicum Annu-um) belongs to the Solanaceae family which has amongst its members potatoes, green peppers, egg plant etc. Weeds which are in the same family are thorn apple, wild gooseberry, Sodomgooseberry, Sodom apple and apple of Peru, among others etc. These solanaceous plants share the same pests and diseases

These technical guidelines are meant for potential paprika producers and/or supporting agencies. They provide information on some of the requirements necessary for the establishment of paprika farming projects. Technical guidelines presented in this publication include: Requirements and key implementation steps.

The implementation steps – among others – include:

- Sowing
- Watering

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- Seedbed pest and disease control
- Transplanting seedlings
- Crop protection
- Disease control
- Harvesting
- Drying
- Grading
- Packaging

Legislation Requirements

There is legislation that governs the production of paprika in Zimbabwe. The statutory instrument allows for greater pest and diseases control and need to be abided by.

The gazetted dates are as follows:

- Earliest date for seed bed sawing – 1 June
- Earliest date for transplanting - 1 September

- Destruction of seed beds – before - 1 January
- Destruction of crops in the land - 1 July

Altitude and Climate

Paprika can grow anywhere in Zimbabwe though some regions produce better and more easily grown crops than others - i.e. the warmer drier regions. Frost kills the crop.

Soil

Paprika can grow in a variety of soils from light sands to very heavy soils. It does well on the richer soils. Good drainage is very critical in the crops production of the crops.

Seedbeds

A good quality seedlings is one with a large healthy root system. Quality is therefore imperative. Seedling quality affects the final yield.

Seedbed site

- Well drained soils
- PH of between 5.5 to 6.5
- Must not follow another solanaceous crop for at least 3 years.
- Keep the site as sterile as possible.
- Avoid smoking or carrying cigarettes or snuff at the seed bed site.

Water for Seedbed

Should preferably be borehole water but where river water is to be used, a settling tank or reservoir must be put in place to avoid nematode infection.

Fumigation

It is very important to destroy nematodes and some grass seeds at the seed bed before sowing. Because inorganic fumigation like methyl bromide are expensive, farmers can sterilize the seed bed by applying heat. This can be achieved by putting a layer of dry trash on the surface of the of the seed bed and burn. If done well, the heat must be able to sterilize the soil up to a depth of 30cm of seed bed soil.

Seed bed fertilization

Uniformly broadcast 1kg of compound S (7:21:7) over an area of 7 – 11 square meters. The higher rate applies rate applies to sandier soils and the lower rate to heavier soils. The Basal fertilizer must be incorporated before seeding to a depth of 5-10 cm.

Sowing

Seed rate is 800 to 1000g per hectare to be planted out.

Sow by hand at 4x 4cm spacing. After dropping cover the seed lightly with soil and mulch.

The mulch must be uniformly even. Uneven mulch result in uneven temperatures, moisture and light and therefore unsatisfactory seedling growth. Use locally available material and in most cases grass.

Watering

Most seed bed problems stem from incorrect watering. The amount of water applied to your beds must equal the amount lost through evaporation and transpiration. The first watering after seeding must provide link up with the residual soil moisture.

Once germination is complete, depending on soil type and mulch, watering can become less frequent. Watering should be done after 8am and before 3pm to avoid soil temperature dropping below 15 degrees C

Top Dressing

The first dressing of 10-20g calcium or sodium nitrate per square metre should be applied when the first true leaves develop. This should be repeated a week later. This second application must be dissolved in water and applied uniformly to the bed just before watering.

Seedbed Pest and Disease control

- Hygiene is critical in this process.
- Seed bed site and surrounding area must be kept free of weeds as they are a fine source of pest and disease infection
- Sterilize all tools and other materials used at the seed bed site.
- Diseases of economic importance are anthracnose, altenaria, sore skin and trichodema. Chemicals for the

treatment of disease may be sourced from agro dealers.

- Pests of importance are ants, cutworms, leaf minors, aphids and thrips.

Hardening

At about four 4 weeks before lifting begin hardening . hardening. Withhold water until seedlings show stress or wilting as early as 9.30am. Then water with a thorough soaking to 12cm depth and leave again until wilting occurs at 930am. Repeat the process until 3 days before lifting.

Clipping and Root Pruning

These are done to promote root development and to check seedling over-growth respectively. These operations should be done hygienically.

Lifting

Three days before lifting – first thorough watering.

Two 2 days before watering – apply Baytan 15 WP drench, and 6 hours later apply an aphicide drench.

One 1 day before lifting – final watering late in the



afternoon. Throughout lifting, the beds must be kept moist.

As soon as lifting is complete, destroy the seedbed.

Transplanting

The land must be brought to a suitable tilth and irrigated to field capacity before transplanting.

Spacing ranges from 18 -20cm x 1-1.3. This range gives population of 55 555 and 38 460 plants per hectare respectively. Directly sown spacing are 20cm x 1.4m for an early September crop. A mid November in situ (under natural conditions seeded) seeded

crop requires a spacing of 18cm x 1.1m.

Fertilization

Correct recommendations are obtained from soil analysis. The basal compound fertilizer need to be positioned beneath the surface of the soil within the root zone before planting. Over the duration of the season, crop with high potential high potential yield of 3-6 tonnes will require applied macro nutrients per hectare as follows.

Nitrogen	200 - 350
Phosphate	100 - 200
Potash	250 - 450

Top dressing begins at

flowering when application of nitrogen and potash commence. This needs to be done regularly (particularly on light soils) at about 2 – 3 week interval using AN. This equates to 120kg AN (split into 2 top dressings) or top dressed in 100kg applications along with one of the nitrogen applications.

Nematode Control

Nematodes cause stunted growth, wilting vulnerability to disease and pale in colour. Rotation is therefore very important and if susceptibility is expected fumigation of the land by EDB becomes necessary Vydate or nemat chemicals nemat chemicals may be used as fumigants. Rate - 800ml in 100 litres of water per hectare.

Transplanting seedlings

Planting seedlings in the land is the most critical operation in the crop's life. It should be done correctly:

- Land should be irrigated to field capacity prior to transplanting.
- Seedlings must not lie drying in the sun waiting to be planted
- Seedlings must be



planted absolutely vertical. Any slanting will encourage lodging later.

- Roots must be covered completely by soil, but the soil should come no higher than the cotyledon nodes on the stem.
- Tap root should not be bend. Must be planted pointing directly downwards.
- No air spaces should be left around roots.
- Cutworm control pyrethroid should be applied at planting.
- Crop must not be stressed. Irrigation be on a 4 or 5 day interval from planting onwards until well established

- Always keep land free from weeds

Direct Seeding (Insitu)

Direct seeding ensures no disturbance of the plants root system which has several benefits. There is no shock period whilst young. The result is a healthy plant which yields with better ASTA.

Crop Protection

Pest control

Nematodes

Fumigation before planting

Cutworms and Ants

Drench with orthen 75WP or Tamaron

Aphids

Aphids transmit viral diseases. They also secrete honeydew which acts as a substrate for black sooty mould. Chemicals like Tamaron, rogor, metasystox 25EC can be used to control aphids.

Thrips

Tiny insects which attack flowers and terminal buds. Cause physical damage and are responsible for spreading tomato spotted wilt virus. Thrips affect Thrips affect leaves to develop a silvery sheen which later becomes russet brown. Pods become stunted and curled. The pest is very difficult to control. Mesurol 80WP has been the chemical in use. Malathion and thionex can also be used to control the common Thrips tabaci

Heliothis ballworm

The young larvae feed on buds, flowers and young pods. Full cover spray of any of Lannate 90 SP, Tamaron 600SL, thionex 35EC will give good control.

Disease Control

A prophylactic spray programme on a regular basis using correct chemicals is recommended.

A meticulous scouting programme must be in place.

Management e.g. irrigation, fertilization weed control must be well done to produce a healthy and high yielding crop.

Harvesting

Paprika growth and development is very temperature dependant. Prolonged warm weather can speed up germination, growth development and maturing of pods. Seedling produced crop registers the first real flush of flowers 4 -6 weeks after planting. Direct seeded crop start flowering from 8-12 weeks after emergence. From the time of this flowering flush, pods should be ready for harvesting within 14-16 weeks. Once pods have reached their full size, they change from green to bright red whilst still fully turgid. From bright red the pods slowly darken to maroon and losing turgidity. Stalks start to dry out and calyx turn yellow.

Pod become leathery to touch and easily wrapped around one's finger without splitting. This is the time to har-

vest as the ASTAs are at their highest.

Artificial ripening can be practical if the need arises but the ASTA content of pods will be reduced.

Drying

- Remove calyxes before drying.
- Desirable moisture content at final drying is 10-12%
- Sun drying
- This is a practical, affordable, cheap and efficient way of drying pods during long spells of dry weather.
- The harvested pods should be laid out in a single layer over a plastic sheeting spread on the open ground. The pods should be turned once a day. Leave the pods in the sun until the moisture the content is at 12 percent.2%

Air drying

This method relies mainly on the atmospheric temperature. The crop will be put on drying racks in a shade. Natural flowing atmospheric air does the drying.

Forced drying

This is the most efficient and reliable means of

drying paprika – regardless of weather condition.

Buildings can be converted into dryers.

Heat is forced into dryers just like in tobacco drying. Tobacco barns can be successfully used in paprika drying.

It must be noted that the temperature of the dryer must not exceed 50 degrees as the oil in the pods are adversely affected above this temperature.

Grading

Three grades are available

A –grade- Dark red/ maroon pods which are free from blemishes.

B –grade-Dark red/maroon pods with up to 20% blemishes.

C –grade- Paler red or orange pods with over 20% blemishes.

White pods and those totally diseased are not saleable. It is better to consult local agronomists for grading specifications.

Packaging

Buyers usually provide packaging material. Product can be packed in Hessian or cotton packs.



Points to note when bailing:

Ensure that the seed is not left out of the bale. It will be assumed that the product is 70 percent pod material and 30 percent seed.

Be certain that the product is at 12 percent moisture content or below.

Any foreign matter will be weighed and deducted from your weights. As soon as bailing is complete, the product should be sent to buyers so that the quality is maintained.

Key Implementing Partners

- Paprika producing companies: Product

processing

- Supermarkets and chain stores: Retailing
- Packaging companies: Packaging
- Local authorities and institutions responsible for agricultural commodities: access to the resource
- Standards Institutions: Maintenance of standards
- Ministry of Health: Health standards

Source: Practical Action



A Guide to Value Addition

Demand for local food has increased.

How do you generate more money from local beef, milk, or produce?

One way is to enhance the value of these foods to consumers. A broad view of adding value is to transform food from its original state to a more marketable state. For instance, you could change sensory qualities, portion size, or convenience of preparation to make products more appealing to consumers.

Examples of increasing economic value include dehydrating or freezing vegetables to extend their shelf life, or crafting cheeses or ice cream from

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dairy products. In each case, the value to the customer is enhanced.

Consider attributes consumers want in their food—for example, no preservatives or genetically modified ingredients, ease of preparation, unique flavours, or extended shelf life. By creating goods with those desired features, producers can generate differentiated products that are no longer simple commodities. Similar products compete against each other in the marketplace, but differentiation allows producers to tailor

their pricing and market strategy to generate consumer awareness and loyalty. Furthermore, new ingredient and manufacturing technologies now allow processors to meet consumers' rising expectations for health, taste appeal, and convenience.

Manufacturing a new food product, however, is not as simple as preparing a home meal. As a producer, you need to understand how to select, receive, portion, weigh, blend, and cook mass quantities of ingredients using different processing technologies. You also need to know about and comply with state and food-safety regulations and inspection requirements to safely process your product and protect

public health.

Assessments must be conducted to learn where to apply monitoring and control measures at raw materials receiving and during processing and storage. These evaluations will ensure your new products are safe for consumers to eat.

You will need to know what kind of packaging will fit the distribution channel (refrigerated, frozen, or shelf-stable) that will best attract your customers' attention or meet their storage needs. You will also need a comprehensive business plan to successfully market your new products.

Creating value-added products is time intensive, taking up to a year or more to develop, but you will achieve significant rewards if your developmental process is well planned and executed (Figure 1).

The purpose of this article is to introduce you to general principles for successfully creating new products and where to find specific guidance at each developmental stage.



Figure 1. Ready-to-sell: Steps toward a successful value-added product.

Step One: Ideation

Your first step for developing a new product is to decide what kind of product you want to offer. Ideas for new products can come from a number of sources: food magazines, food industry newsletters, food blogs, food industry trade shows, websites, as well as friends or your employees. You should also search social media, such as Facebook, Twitter, Pinterest Recipes, and Instagram, for novel concepts.

In general, consumers are searching for foods

that offer health benefits, taste appeal, and ready-to-cook or ready-to-eat convenience right out the package. When you consider product options, take a look at those already offered by the retailers or food distributors with which you want to do business. As one grocery retailer said, "I'm looking for unique items—I have enough barbecue sauces to last a lifetime." If you already have a relationship with a retail or wholesale buyer, ask that buyer for specific advice about what types of products would readily sell at their establishments.

Balance the kind of product you want to produce and market against your

manufacturing and delivery capabilities. You may need specialized ingredients to enhance the nutrition, palatability, or shelf life of your product.

Food-safety regulations may influence your choice of processing and packaging options. Depending on your ingredients, manufacturing requirements, and method of distribution (at room temperature, refrigerated, or frozen), you may need to contract with a co-packer to produce your product. Also consider labour, packaging, and transportation costs for the markets you want to serve. These expenditures will determine if you can sell your new product at a price that covers your manufacturing, distribution, and marketing costs while providing you an acceptable profit.

Before investing your time and capital to transform a product concept into a saleable item, seek both business and technical assistance. A business specialist can help you assess the costs of investing in the operation and the anticipated returns. A technical specialist can answer questions related to equip-

ment, labour needs, and food safety, among other topics. For low- and no-cost guidance, see the suggestions below and check with your local community college or small business development centre.

Before meeting with these experts for help, identify a few key details about your product and process. You should know who your target customer is, what consumer needs your product will satisfy, how you will sell your product (i.e., refrigerated, frozen, or shelf-stable), and if you will sell directly to consumers (i.e., farmers markets or online), retailers (i.e., grocery chains or gourmet food stores), or bulk distributors.

Step Two: Develop a Recipe

Once you decide on a product, develop a standard recipe and evaluate its appeal to potential consumers. An inexpensive method for assessing the acceptability of your product is to conduct sensory evaluations or “taste tests” with friends or your company personnel. Allow individuals to rate the flavour,

texture, colour, aroma, and appearance of food on a scale from 1 to 7 where 1 is “unacceptable” and 7 is “excellent” (Figure 2).

In addition to numerical scores, encourage your sensory participants to comment on what they like and dislike about your product and why. This information, in addition to the scores, will help you determine how best to modify your recipe to remedy any deficiencies identified by your informal sensory panel.

PRODUCT SCORE SHEET					
NAME: _____		PRODUCT CODE			
DATE: _____		A04 (Product X) S04 (Product Y) E04 (Product Z)			
		SCORE FOR:	A04	S04	E04
7 = Excellent 6 = Very Good 5 = Good 4 = Fair 3 = Poor 2 = Very Poor 1 = Terrible	FLAVOR				
	TEXTURE				
	AROMA				
	APPEARANCE				
	PUT YOUR COMMENTS HERE				
A04:					
S04:					
E04:					
SUGGESTED PRICE <i>(Please circle one for each item)</i>					
A04:					
1) \$XX.XX 2) \$XX.XX 3) \$XX.XX					
S04:					
1) \$XX.XX 2) \$XX.XX 3) \$XX.XX					
E04:					
1) \$XX.XX 2) \$XX.XX 3) \$XX.XX					

If you want more detailed feedback from your target customers, you may wish to conduct large-scale consumer evaluations of your product.

Step Three: Create a Product Formulation

Once you are satisfied with your recipe, you are ready to transfer your developmental work to a manufacturing setting. Weigh the ingredients in your recipe so you can convert US measurements, such as tablespoons, cups, ounces, and pounds, into metric units (grams). Then calculate the percentage each ingredient contributes to the entire recipe by dividing the weight of an ingredient by the total weight of all the ingredients in your recipe and multiply by 100. You will use this formulation to calculate the quantity of ingredients for a specific batch size (e.g., 100 grams, 1000 grams, or more) when you begin manufacturing your new product on a commercial scale.

You may need special ingredients to enhance or maintain your product's sensory qualities over time or extend its

shelf life. For instance, additives called gums control the loss of water from meat and vegetable ingredients to keep them moist over time. Natural antioxidants, such as rosemary, protect the flavour of your product, and lactic and acetic acids can suppress the growth of spoilage bacteria.

Enter ingredient levels and prices into a spreadsheet so you can calculate how adjustments to your formulation will alter your product's total manufacturing costs. You can then balance this information against a target retail cost and sensory quality to create an item that is both appealing and profitable to manufacture. You should consistently record and track your product's finances so you can quickly identify trends that positively or negatively affect your profits.

Step Four: Refine the Formulation and Enhance Production Efficiencies

At this stage, you will adjust your formulation and manufacturing process to ensure you can mass-produce your product without sacrificing its sensory qualities.

Several to-scale tests or production trials may be needed to verify that your processing equipment operates properly and your production methods deliver the highest yields of saleable product.

You could also contract with a co-packer to test and produce your product. Co-packers are established food businesses that will process and package your product according to your specifications. An advantage of using a co-packer is you can devote more time to distributing and promoting your product. Manu-

FINANCIAL INFORMATION				
PRODUCT	DESCRIPTION:	Product XYZ		
PRODUCT NUMBER:		#1234		
		INPUT%	\$'s	% NET
List Selling Price			73.20	
Net Selling Price		5.8%	68.95	100.0%
Variable Costs				
Ingredients			24.09	34.9%
Packaging			4.91	7.1%
Labor			<u>6.52</u>	<u>9.5%</u>
Total Variable Cost	Margin		35.52	51.5%
Over Variable Cost			Variable	33.43
				48.5%
Selling Expenses				
Marketing Trade		12.6%	8.69	12.6%
Promotions Freight			11.00	16.0%
Brokerage		2.2%	1.52	2.2%
			<u>2.07</u>	<u>3.0%</u>
Total Variable Selling Expenses			23.27	33.8%
Contribution after Variable Selling			Fixed	10.16
				14.7%
Expenses				
Plant Expense Field			12.98	18.8%
Selling Overhead & Interest		3.4%	2.34	3.4%
			<u>1.86</u>	<u>2.7%</u>
Total Fixed Expenses			17.19	24.9%
Pre-Tax Profit (Loss)			-7.03	-10.2%

facturing costs, however, can be expensive. During your manufacturing trials, you will make significant adjustments in your process to enhance production efficiencies. To ensure these adjustments do not negatively impact the sensory quality of your product, conduct informal sensory evaluations with friends or employees as described earlier in this publication. Your goal is to incrementally improve manufacturing proficiencies without sacrificing the desirable characteristics that will make your product appealing to your target customer.

When you have achieved a production formulation that meets your cost and quality targets, your next step is to conduct a shelf-life evaluation to determine the time it takes for spoilage microorganisms to grow and make your product unfit to eat.

Step Five: Regulatory Assessments

You have finalized the formulations and production process for your new product. Next you need to comply with government safety



regulations and nutrition labelling requirements. Your product may be subject to regulations, such as the food-safety rule, that help processors identify where in their manufacturing process they can prevent, eliminate, or reduce to an acceptable level biological, chemical, or physical hazards that can make food unsafe to eat. All processors need sanitation programs to ensure food-handling practices throughout their manufacturing facilities do not contaminate products, potentially making them unsafe for consumption. If your value-added product will be manufactured at a

co-packer or commercial kitchen, that business entity is responsible for meeting these regulatory requirements. If you plan to manufacture the product yourself, be sure to fully understand and assess regulatory compliance costs and include them in your business plan.

Step Six: Market Introduction

Whether you plan to sell directly to consumers, retailers, or wholesalers, you need a website to provide your target customer with information about your company, what makes your product unique, and where it

can be purchased. Websites are basically online sales brochures where you can continuously update photos, videos, customer testimonials, and other promotional features without incurring print costs.

Retail and wholesale buyers will want to review sales literature prior to meeting with you in person to determine if your item fits with their existing line of value-added products or meets consumer needs.

A sales brochure should feature a photo and brief description of your product—brand name, type of packaging, shipping-case dimensions, and pricing—that all buyers require for an initial evaluation.

Adapted from NC Extension



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The Agribusiness Expert Answers



Q What is all-in-all-out system in poultry production?

A All In All Out is when you buy all your chickens at once, run them as a flock for a predetermined period of time (usually around two to three years) then cull (kill) them all and replace them with a completely new group of chickens.

The main advantage is that it eliminates the risk of introducing parasites and disease when adding new birds to the existing flock, as is done with the Staggered Replacement management

system.

It also avoids the inevitable interruptions to the social structure of the flock, sometimes known as the pecking order, when you introduce new young chickens to an established flock

Disadvantages
With layers, if you lose some of your flock due to predators or disease you may not get enough eggs for your needs forcing you to break the all in all out cycle by buying replacement chickens or to bring forward

your all out culling date. While egg production will start off high it will gradually fall as the chickens grow older.

Word Search

N	T	G	N	I	L	A	E	P	P	A	L	E	S
P	R	O	D	U	C	E	K	L	I	M	C	O	S
L	A	C	O	L	E	S	T	A	T	E	O	S	E
A	E	P	I	C	E	R	F	O	O	D	M	R	E
B	N	G	S	P	E	T	S	I	I	B	M	E	S
O	L	T	S	M	O	N	E	Y	A	R	E	M	C
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P	M	E	G	E	L	L	O	C	A	M	I	S	E
D	E	V	E	L	O	P	E	E	O	E	A	U	S
I	P	A	C	K	A	G	I	N	G	G	L	C	H
C	O	S	T	I	N	G	D	E	M	A	N	D	E
O	E	O	A	T	T	R	I	B	U	T	E	S	E
N	L	A	N	I	G	I	R	O	F	E	E	B	T

- ATTRIBUTES
- RECIPE
- CUSTOMERS
- REGULATIONS
- DEVELOP
- MILK
- COSTING
- SCALE
- SCORESHEET
- STEPS
- PACKAGING
- COMMERCIAL
- APPEALING
- STATE
- ORIGINAL
- BEEF
- PRODUCE
- DEMAND
- MONEY
- COLLEGE
- VALUE
- LABOUR
- LOCAL
- FOOD

Online Version

N	T	G	N	I	L	A	E	P	P	A	L	E	S
P	R	O	D	U	C	E	K	L	I	M	C	O	S
L	A	C	O	L	E	S	T	A	T	E	O	S	E
A	E	P	I	C	E	R	F	O	O	D	M	R	E
B	N	G	S	P	E	T	S	I	I	B	M	E	S
O	L	T	S	M	O	N	E	Y	A	R	E	M	C
U	E	L	U	C	C	E	U	L	A	V	R	O	O
R	E	G	U	L	A	T	I	O	N	S	C	T	R
P	M	E	G	E	L	L	O	C	A	M	I	S	E
D	E	V	E	L	O	P	E	E	O	E	A	U	S
I	P	A	C	K	A	G	I	N	G	G	L	C	H
C	O	S	T	I	N	G	D	E	M	A	N	D	E
O	E	O	A	T	T	R	I	B	U	T	E	S	E
N	L	A	N	I	G	I	R	O	F	E	E	B	T

There 5 differences between these pictures. Can you spot them?

See answers on Agribusiness Talk social media handles






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