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STOP ORDER LIFTED ON BT80311

by Trevor Falloon

Just over a year ago SIRI was forced to announce that the recently released BT80311 had fallen to the new orange rust disease affecting the industry. Now we have enough additional information to cautiously lift that ban and allow for further use of this very productive new variety.

Investigations convince us that the symptoms observed in St Thomas that led to the placement of a stop order, may have developed because of stress to which the particular field may have been subjected. Observations on BT80311 growing elsewhere in St Thomas, some in relatively close proximity to the "disease" site, have so far failed to show similar symptoms. Also, the field that originally showed symptoms has since been harvested and the regrowth appears healthy and vigorous.

Meanwhile, BT80311 growing elsewhere in the industry - in St Catherine, Clarendon, St Elizabeth, Westmoreland - has maintained its vigour and has shown no sign of orange rust susceptibility. Even at Worthy Park where so many varieties show symptoms under the intense disease pressure in that valley, BT80311 appears largely disease free.

As is well known, canes under stress of one sort or another become more prone to disease. Cane growers are by now familiar with the profuse ap-

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BT80311 field which had shown orange rust symptoms leading to stop order in 2011. Background - regrowth of field showing no symptoms in 2012. Foreground - disease-free sprouts from area cutback and used for seed cane

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RECENT DEVELOPMENTS IN ORANGE RUST CONTROL

by Trevor Falloon & Derrick Wright

Traditionally, Jamaica's sugar industry has not resorted to the use of chemicals in disease control. Under the onslaught of orange rust however, Worthy Park has had to turn to fungicides in an effort to reduce the economic loss this disease has brought. With yields falling from more than 80 tonnes cane per hectare (tc/ha) before the entry of orange rust to some 65 tc/ha, the estate in 2012 was forced to begin protecting the crop by aerial application of fungicides. This was the approach adopted in Florida where the disease made its first appearance in this Hemisphere in 2007.

A single spraying is not normally sufficient to give adequate protection against orange rust during a crop. Florida in fact was known to spray four or five times at 3-weekly intervals during the summer months in orange rust control. Since orange rust is known to rapidly develop resistance to fungicides, the spray progarmme has had to be based on not one chemical only but on several with different modes of action.

Fungicide Screening

SIRI began fungicide screening trials comparing Amistar, Silvacur and Dithane at Worthy Park in February 2012 following a 3-weekly spray schedule. Orange rust is however a summer disease reaching its peak in the July/August/September period. Although there were early signs of orange rust in fields, a trial laid down in February would have to be regarded as a mere indicator of probable effectiveness. This would account for what seemed like erratic results obtained. Later on in June another trial was started results of which were not known at the time of this publication. In this trial, the interval between spraying was varied in order to ascertain whether a longer period between spraying could be adopted thus permitting fewer applications and a consequent reduction in the cost of control.

Fields at Worthy Park, July 2012, a month after treatment with fungicide Amistar, in orange rust control

Commercial Treatment

Meanwhile, Worthy Park also conducted its own fungicide tests and by late June, 2012, made its first commercial aerial application using Amistar, a systemic fungicide. Although fungicides are relatively safe chemicals from a human health standpoint, special care was exercised in observing a buffer zone of at least one field (approximately 100m) between the fields targeted and the nearby village as well as around the estate's own residences, factory, distillery and poultry houses. Spraying was conducted by spray plane between 5:30 and 9:00 a.m. when the air was calm to minimise possibility of wind drift.

By mid-July encouraging results were observed as sprayed fields appeared greener than had been seen at that time of year since the advent of orange rust in 2008. The estate then conducted a second spraying applying Baycor on one section of the farm and Dithane on the remainder. This split was dictated by the local availability of commercial quantities of fungicides. Normally, Dithane, a contact fungicide, would not be the first choice in a spray programme against orange rust. The systemics like Baycor, Amistar and Silvacur are preferable. The estate was preparing to carry out a final application, using a different type of fungicide in August.

Resistant Varieties

Ultimately, the way forward is to develop varieties resistant to orange rust as was done before this for brown rust and sugar cane smut. That should make it unnecessary in future to resort to the expensive alternative of fungicidal applications. However, since orange rust was not part of the environment of the Western Hemisphere before 2007, when it was first detected in Florida, our breeding stock was never exposed to the

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SIRI INITIATES DRIVE FOR PURE STAND CANE FIELDS

by

Uriel Green and Kirkwood McPherson

Growers cultivate sugar cane with the reasonable expectation of making profits. As we know, however, a number of factors can convert potential profits into loss. Factors that immediately spring to mind include the quality of land preparation, weed control, fertilizer application, irrigation and drainage etc. Such factors are usually uppermost in the minds of growers. Often the sugar cane variety tends to be taken for granted. Yet, the variety chosen and how we manage it are among the most important factors affecting profitability. Given this reality it is surprising how often it is next to impossible for a grower to tell which of his varieties performs best.

Keeping Varieties Separate

Varieties must be established in such a way as to enable growers, and processors to evaluate each on its own merit. In assessing a farm's performance the relative productivity and cost-effectiveness of the respective varieties grown are most important considerations. If such comparisons can be made a grower will soon recognise that each variety has its own peculiar management requirements, associated growing cost, resistance to various diseases, best time for planting and harvesting, and its own earning power. The main reason that it is often impossible to carry out a meaningful variety assessment is that they are all mixed up in the fields and not grown in discrete blocks.

Variety Adaptation

Growers need to know which varieties perform best in the environment present at various locations on the farm. Farms are very rarely uniform in character across their whole length and breadth. Some parts of the farm might have acid soils while other parts may be neutral or even salty (alkaline) by nature. Some areas would have soils of greater depth than others. Soil texture might vary from clay to loam to sand or sometimes peat. The water table might be high in some spots and low in others. Each of these conditions poses different sets of challenges to varieties.

When conditions are ideal (which could be described as fertile, loamy, neutral to slightly acid well drained soil with adequate moisture) the choice of variety may not be very critical. On the other hand, the closer conditions are towards any extreme, for instance the heavy clays or the light sands, the acid or the alkaline soils etc then we will find that some varieties are better able to cope than others. Planting one or the other can make big differences to earnings realized.

Diseases

If on top of those environmental conditions we add diseases, then we will find that some varieties may be totally unsuitable for certain farms. Diseases are in fact of particular concern at this time with the recent entry of orange rust and the development of a new strain of smut. As diseases are by nature contagious, having a disease susceptible variety will affect not only that variety but others within its vicinity. When a smut whip, for instance, releases its spores the highest concentration falls on plants right next to it. High spore concentration will overcome the natural resistance of any variety and so smut susceptible varieties can induce a breakdown in resistance of varieties grown in close proximity. The best way to reduce this occurrence is to avoid mixing disease susceptible varieties with the recommended varieties during planting. Should any such "contamination" occur then such stools should be removed as soon as they are identifiable after germination.

Mixed stands, as reported by growers, alarmingly account for some 25% of cultivated area annually. The actual figure could be much higher than reported as many fields listed as a specific variety are known to contain a number of other varieties. The system of recording often lists only the main variety in a field. There have been instances in which as many as eight varieties have been observed in a field - which happened to have been listed as comprised of a single variety.

Many times mixing is not due to deliberate policy but a farmer may purchase cane feed from sources which were not properly treated as designated nurseries and so not enough care may have been taken to ensure the purity of stands. All it takes is the odd stool of a couple of other varieties than the main one which

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SIRI's pure stand sugar cane nursery, Clarendon, from which seed cane is sold to establish secondary nurseries

Variety Recommendations for Harvesting Periods & Soil Types

Cane Growing Area	Harvesting Period	Light Soils	Clay Loams	Clays	Cane Growing Area	Harvesting Period	Light Soils	Clay Loams	Clays
		BJ7465	BJ7465	BJ7465			BJ7465	BJ7465	BJ7465
		BJ7015	BJ7015	BJ7015			BJ7938	BJ7938	BJ7938
		CR892023	CR892023	CR892023			BJ8783	BJ7452	BJ7452
		BJ7314	BJ7314	BJ7452			BT80311	BJ7627	BJ7627
	Early	BJ8783	BJ8783	BJ8783		Early		BJ7314	BJ7314
		BJ82105	BJ82105	BJ82105				BJ82105	BJ82105
		BJ7938	BJ7938	BJ7938				CR892023	CR892023
		BJ7452	BJ7452					BJ8783	BJ8783
		BJ78100	BJ78100					BT80311	BT80311
Westmoreland		BJ7504	BJ7504	BJ7504	St. Thomas		BJ78100	BJ7627	BJ7627
&		BJ7015	BJ7015	BJ7015			BJ7938	BJ7938	BJ7938
Hanover		BJ7938	BJ7938	BJ7938			BJ82105	BJ82105	BJ82105
		BJ82119	BJ82119	BJ82119			BJ82119	BJ82119	BJ82119
	Middle	BJ7452	BJ7452	BJ7452		Middle	BJ8783	BJ8783	BJ8783
		BJ7465	BJ7465	BJ7465			BJ7504	BJ7504	BJ7504
		BJ82105	BJ82105	BJ82105			BT80311	BT80311	BT80311
		BJ8783	BJ8783	BJ8783				BJ78100	
		BJ78100	BJ78100	BJ78100					
		BJ7627	BJ7627	BJ7627			BJ7627	BJ7627	BJ7627
	Late	BJ82119	BJ82119	BJ82119		Late	BJ8783	BJ8783	BJ8783
		BJ8783	BJ8783	BJ8783			BJ7938	BJ7938	BJ7938
		BJ78100	BJ78100	BJ78100			BJ78100	BJ78100	
		BJ7465	BJ7465	BJ7465			BJ7465	BJ7465	BJ7465
		BJ7015	BJ7015	BJ7015			BJ82119	BJ82119	BJ82119
		BJ7938	BJ7938	BJ7938			BJ8783	BJ7504	BJ7504
		BJ82119	BJ82119	BJ82119			CR892023	CR892023	CR892023
	Early	BJ82102	BJ82102	BJ82102		Early	BJ78100	BJ78100	BJ8783
		BJ82105	BJ82105	BJ82105			BJ7938	BJ7938	BJ7938
		BT80311	BT80311	BT80311			BJ7015	BJ7015	BJ7015
		CR892023	CR892023	CR892023			BJ7548	BJ7548	BJ7548
Irrigated		BJ8783	BJ8783	BJ8783	Trelawny			BJ8783	
Clarendon &		BJ82119	BJ82119	BJ82119	St. James		BJ82119	BJ82119	BJ82119
St. Catherine		BJ7548	BJ7548	BJ7548	& St. Ann		BJ7938	BJ7504	BJ7504
Plain		BJ82102	BJ82102	BJ82102			BJ8783	BJ7465	BJ7465
	Middle	BJ78100	BJ78100	BJ7504		Middle	BJ7548	BJ7548	BJ7548
		BJ8783	BJ8783	BJ8783			BJ7627	BJ7627	BJ7627
			BJ7504				BJ78100	BJ78100	BJ8783
								BJ7938	BJ7938
								BJ8783	
		BJ7627	BJ7627	BJ7627			BJ7627	BJ7627	BJ7627
	Late	BJ8783	BJ8783	BJ8783		Late	BJ8783	BJ8783	BJ8783
		BJ78100	BJ78100				BJ78100	BJ78100	BJ82119
							BJ82119	BJ82119	

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GETTING THE MOST FROM HERBICIDES

by Edmond Lewis

A chemical used to kill, damage, limit, or otherwise inhibit the growth of plants is called a weedicide or herbicide. Such chemicals are toxic to plants, and are used to destroy unwanted vegetation, more commonly called weeds. The use of herbicides is, of course, only one tool available to farmers in the process of weed management. Other tools include inter-row cultivation, manual removal, the use of cane growth characteristics; and a combination of all the tools as appropriate, commonly called the "integrated approach" to weed management.

Weed control denotes the destruction of unwanted plants, or damaging them to the point where they are no longer competitive with the crop. Weed management, on the other hand, can include weed control, but is often associated with suppression, avoidance or even incomplete kill that provides economic benefit such as reduced competition with the crop, allowing the crop space and time to recover and produce economically.

Herbicides are widely used in the management of weeds in agriculture generally and account for approximately 70% of agricultural pesticides used worldwide. Reasons for the reliance on herbicides include ease of use, long lasting effect, scarcity of labour, efficiency of weed kill, selectivity which allows use without harm to the crop and of course effective marketing of the product. In sugar cane, to get the most from herbicides there are certain things the cane grower needs to understand:

- How the herbicide works, that is, its mode of action
- The range of weeds controlled: broad spectrum versus narrow spectrum, and effectiveness within spectrum
- How to time the herbicide application based on the range of weeds present and the herbicide's mode of action
- Whether the herbicide is designed to be applied pre-plant, pre emergent, early post emergent or late post emergent;
- The rate appropriate for any given condition such as heavy versus light soils, wet season versus dry season
- Dealing with problem weeds in certain areas
- Other peculiar characteristics such as compatibility with the crop or with other chemicals in a mix, health hazards etc

Excellent weed control from pre-emergent herbicide use followed by inter-row cultivation in a weed management programme

Mode of Action

How a particular herbicide works is usually stated in terms of whether it attacks an important plant enzyme or protein, or whether it interferes with a biochemical process in the plant. In some instances this action may be affected by exposure to sunlight or presence of soil moisture and/or prevailing temperature. No herbicide belongs rigidly to any particular group, but instead, is regulated by factors such as time and method of application, chemical formulation, environmental conditions, dosage, and stage of growth of the weed species.

Contact herbicides destroy only the plant tissue that comes in direct contact with the chemical. Generally, these are the fastest acting herbicides. They tend to be less effective on perennial plants, which are able to re-grow from underground structures (rhizomes, roots, stolons, or tubers). For best results contact herbicides should be applied uniformly and sparingly to living tissues, without allowing for run-off. Run-off tends to concentrate the herbicide towards the tip, or lower reach of the leaf, reducing the toxic effect on the upper portions. Contact herbicides, because of their nature, must always be applied to vegetation, never to the soil.

Systemic herbicides are capable of moving through the plant, either from the leaf down to the roots, or from soil application up to the leaves. This group includes herbicides such as glufosinate, glyphosate, 2,4-D, and dicamba. They are capable of controlling perennial plants and may be slower acting, but ultimately more effective than contact herbicides.

Residual Herbicides are applied to the

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Pure Stand Cane Fields...

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the purchaser then billets and plants and instead of a true stand of the intended variety he has a field that is hopelessly mixed. If he in turn sells this material as seed cane to another grower then the problem is vastly compounded.

When the odd stools turns out to be of a disease susceptible variety then the grower finds himself with a disease riddled field. It is easy under such circumstances to mistakenly ascribe the disease to the wrong variety.

Growers should note that a variety may be quite susceptible to a disease in one location even while it may be successfully grown in another. That is because the environment often has a very strong influence on the expression of disease. It is well known for instance that several varieties which cannot be grown in the dry southern plains because of smut susceptibility have performed quite well in the high rainfall areas.

Assessing Variety Performance

Keeping fields disease free is only one reason for ensuring that the farm is comprised of only pure stands. Other benefits are that the grower is able to compare performance of varieties and determine which ones are best adapted to his farm, which does better on the acid soils, which gives the highest cane yield, the has best sucrose content, which appears more drought resistant etc. This allows him to manage his varieties to get the best yield from each micro-environment on the farm and by so doing maximise profitability.

Variety Selection

The variety breeding and selection process carried out by SIRI in collaboration with the West Indies Central Sugar Cane Breeding Station in Barbados is designed to produce varieties suited for the range of environments faced by the Jamaican cane grower. This is a long rigorous process extending over 12 to 15 years designed to provide the grower with the best varieties for his growing conditions. The years of testing involve observations in different environments across the country so that by the time a variety is eventually released there is an adequate body of data to guide both the growers and the researchers as to its appropriate deployment.

Once a variety's capacity to measure up to standard varieties already in production is determined, the extensive testing programme then takes it into all the major ecological zones to see to which ones it is best adapted. A variety has its best chance of fully expressing its genetic potential when grown under conditions that are most suitable to it.

To assist growers, SIRI periodically publishes guidelines setting out which varieties are recommended for planting within broad ecological zones and on which soil type(s) for harvesting in early, mid or late crop periods (see back page). From time to time these recommendations must be adjusted. For instance with the recent entry of orange rust into Jamaica, SIRI has had to modify the list, withdrawing varieties which indicate susceptibility and putting forward resistant substitutes.

Seed cane

No grower can afford to turn a blind eye to his seed cane source. For reasons outlined, the grower cannot be too careful about the type of material planted. The sure way to develop a farm of pure stands is to plant only material grown in carefully tended sugar cane nurseries. This will be the best guarantee of obtaining seed cane that is true to type. Large farms are always encouraged to set aside some 5% of area for nursery cane production to satisfy their own planting needs.

Nursery Inspection

It takes quite a bit of practice to be able to correctly identify sugar cane varieties as identifying marks are not always very obvious and the average grower is not expected to develop this skill. SIRI's Extension Officers in collaboration with the Variety Department are however committed to assist growers in establishing

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Stop Order Lifted on BT80311...

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pearance of smut whips in varieties normally resistant whenever there is severe drought.

No sugar cane variety is ever immune to common diseases. If conditions are favourable for the disease even the most resistant variety may express symptoms. Smut resistant varieties can be made to produce smut whips if exposed to too heavy inoculum load. That is why we insist on purity of stands in fields. Smut spores given off by a stool of the highly susceptible HJ5741 may cause surrounding stools in a field of say BJ7504, known for its smut resistance, to produce smut whips. Too many fields now fall into the category "Mixed." Unfortunately, some fields are populated with as much as six or more varieties some of which should no longer be grown because of disease susceptibility.

BT 80311 has continued to grow impressively in other areas of the industry. It has become highly favoured among growers and so it is with some relief that we now cautiously lift the order curtailing its expansion. Meanwhile we will continue to closely monitor its performance ✪

BT80311 with lower leaves stripped to show profuse tillering

GETTING THE MOST FROM HERBICIDES...

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soil and are taken up by the roots or stems of the target weeds. Residual herbicides include pre-plant incorporated herbicides which may be applied to the soil prior to planting and are mechanically worked in, e.g. clomazone (Command) and metribuzin (Carzone, Sencor). A second type of residual herbicide is the pre-emergent type applied to the soil as the last operation after planting and covering before the crop emerges. Such chemicals prevent germination or early growth of weed seeds and include herbicides such as isoxaflutole (Merlin), hexazinone (Velzone, Velpar), dicamba (Weedmaster, Kambamaster).

Post-emergent herbicides are applied after the weeds have emerged and are, in general, competing with the cane. They include glyphosate (Roundup, Glyphos, Credit) and glufosinate (Finale). Many herbicides such as ametryn, terbutryn, hexazinone, asulam, and diuron have dual capabilities and can be used at both pre- and post-emergent stages.

Range of weeds controlled

All categories of herbicides will not control all types of weeds. Herbicides are classified as either broad spectrum, or narrow spectrum. A broad spectrum herbicide is one, e.g. glyphosate, capable of controlling most vegetation present on the land. A narrow spectrum herbicide on the other hand, is selective and will kill only specific types of plants, either grass or broadleaf - not both, e.g. 2,4-D is effective against broadleaf plants and Fusilade against grasses. Varying the rate of application can cause a herbicide (even a broad spectrum) to act selectively in killing certain types of vegetation, while the hardier species remain unharmed. The main crop is never totally immune from harm, even with selective herbicides, since the prevailing environmental factors (temperature and moisture mainly) may predispose the crop to suffering some damage.

Managing Problem Weeds

In some zones, a species of weed predominates and pose a real challenge to management. In these cases, the first line of defence is good land preparation. Use of herbicides should be secondary and according to the following examples:

On the Southern Plains where wild pangola (Dichanthium annulatum) tends to be a severe problem, farmers in the Monymusk area use a tank mix of asulam (6 L/ha) and diuron (2 L/ha) as post emergent spray to combat the weed at early runner stage, or glufosinate (2.5 L/ha) at a more advanced stage. Recommendation from SIRI is to begin with pre-emergent spray of metribuzin (Sencor, Carzone) which will reduce weed pressure in the field by as much as 95%, reducing subsequent need for herbicide application.

Throughout the cane growing areas where guinea grass (Panicum maximum) exists, pre emergent application of Merlin, or Velzone/Velpar gives best results. Adequate control is had with Krismat (2 kg/ha) at early post emergence, and with a tank mix of diuron 1.6 L/ha and hexazinone (1.8 – 2.0 L/ha) at the early to mid-post emergence stage.

Corngrass (Rottboellia cochinchinensis) which is a problem throughout cane growing areas, is best controlled by pre-emergent application of Merlin, or Velzone/Velpar. Adequate control is had with Krismat (2 kg/ha) at early post emergence. The best response at post emergence is with terbutryn singly (4-5 L/ha) or tank mixed with diuron (1.5 L/ha) while reducing the terbutryn to 3-4 L/ha.

Effects of soil characteristics

Soil type, soil condition, and soil constituents may affect the performance of residual herbicides. In general, as a herbicide is applied to the soil the process of breakdown starts. Sunlight and soil microbes begin to degrade the herbicide, while organic matter and clay tend to bind and make it less available to the target weed. For this reason, pre emergent applications on soils high in clay and/or organic matter contents should be at the highest recommended rate for the target weed species. In dry areas, pre-emergent herbicides might not be effective since soil moisture is a prerequisite for their activity. Some herbicides (Merlin, Ametryn, Diuron) are so designed that they can be applied and will be activated when moisture becomes available.

Application of herbicides

Boom Spraying: Most herbicides are applied as water-based sprays using ground equipment. Ground equipment varies in design, but large areas can be sprayed by use of tractor-mounted, or tractor-drawn sprayers equipped with a boom to which up to six or more nozzles spaced 1.5m or 1.68m apart are attached. Depending on the row spacing, the typical boom used in sugarcane in Jamaica varies be-

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A good weed control programme is an important component in producing vigorous healthy cane growth

GETTING THE MOST FROM HERBICIDES...

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tween 9m and 10m in width. Nozzles appropriate for row spraying of herbicides are the flat fan or floodjet types.

Knapsack Spraying: For manual spraying, the knapsack type sprayers are more convenient and efficient. Usually, the floodjet type of nozzle is used.

Herbicides are commonly combined and applied as a tank mix. Combinations are used to give more thorough control, or a broader spectrum of weed control.

Health effects

Certain herbicides affect metabolic pathways and systems that are unique to plants (and are not in animals), making many modern herbicides among the safest crop protection products, having essentially no effect on mammals, birds, amphibians or reptiles. However, some herbicides can cause a variety of health effects ranging from skin rashes to death. Health issues arise from accidental direct consumption of the herbicide, improper application that results in the herbicide coming into contact with persons or wildlife, inhalation of sprays, or consumption of food too soon after chemical treatment.

Appropriate protective gear should always be worn in accordance with the product label.

Peculiar herbicide characteristics

To increase the range of weeds controlled in a single application, herbicides with varying capabilities are commonly mixed in the tank. Although they can work together, too often problems arise because they are added in the wrong order. The general principle governing the mixing of various chemicals in a tank is to put in solid before liquid, followed by flowable, emulsifiable concentrate, and solution.

Use of adjuvants in the mixture has many advantages, chief of which are the retention of herbicide spray on leaf surface, allowing chemical spray to penetrate waxy surfaces, and facilitating the spread of the herbicide over the leaf surface. An adjuvant can overcome the properties that tend to cause two chemicals to behave incompatible or immiscible. It therefore usually pays to include an adjuvant in all herbicidal spray mixtures.

Summary

Herbicides are used in the management of weeds in sugar cane fields because of certain advantages. However, the grower will only get the most from herbicides through proper application of related knowledge. For best results, growers should concentrate on the following:

» Select the herbicide based on weeds to be controlled. It makes no sense to apply a grass killer to broadleaf weeds, or vice versa. Read and pay attention to the colours, symbols and graphics on the labels.

» Apply the herbicide at the correct time. Post emergent herbicides applied before weeds are present are a waste of time and resources and will not give any control. Similarly, the application of pre-emergent herbicides to weeds already growing and competing with canes will, at best, result in partial control. Applying at the recommended time (before weeds emerge) will guarantee more than 90% kill of weed seeds as they germinate under ideal conditions.

» For targeted weeds, use the recommended herbicides and rates, and do application at weed stages that offer most efficient control.

» When a wide variety of weeds are already in a field or are expected to emerge, a cocktail of herbicides with dual capability might be the most effective and economic.

» Measure and mix herbicides in recommended order, and include an adjuvant in all post emergent sprays. It is beneficial in both wet and dry seasons.

» Herbicides are most effective during the wet season.

Finally, in spite of the advantages offered by herbicides it should always be remembered that some are potential safety hazards. Growers should do what is necessary to protect themselves, their families, other workers and the environment by wearing the protective gear recommended by the manufacturer as stated on the label ✪

Pure Stand Cane Fields...

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pure stand nurseries from which seed cane may be confidently sold or purchased to establish pure stand fields. Growers about to purchase seed cane should call on SIRI's assistance in inspecting the prospective nursery plots as a first step. Seed cane should only be purchased from that potential source on SIRI's recommendation.

Where the grower is about to establish his own nursery SIRI will not only inspect the seed cane source to ensure that it is of the recommended variety and satisfactorily pure in nature but once a nursery plot has been established, SIRI will also follow up by inspecting at an appropriate stage of growth for any contaminants that might have escaped earlier detection. Contaminants must be removed before SIRI will recommend such nursery plots to growers as sources of seed cane.

Text Messaging

In the last year, SIRI has actively issued timely notification via text messaging of availability of good quality seed cane. Growers can avail themselves of this service once their plots are inspected and deemed to be of acceptable standard.

Conclusion

The drive to establish pure stands throughout the industry is particularly critical at this time when the industry is expected to embark on a massive expansion programme to move from current less than 2 to over 3 million tonnes cane per annum. In a few years time this industry could be one in which varieties such as the recently released BJ8783, BJ8841, CR802023 and BT80311 have each carved out their particular ecological niches alongside the older varieties (BJ78100, BJ7465, BJ7938 etc). In such a scenario the industry would reap the benefit of having the appropriate variety growing in the ecological niches to which it is best adapted. The alternative, which is a real possibility if certain trends are not arrested, is too disturbing to contemplate.

Encouragingly, certain estates and farms have always embraced the concept of pure stands and continue to practice this to their economic advantage. This drive is to ensure that this becomes standard practice among all cane growers ✪

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and Bayer's Distributors in the Caribbean
Carter & Company/Barbados
Carlsen Chemicals & Tracmac Engineering/Trinidad
AINLIM/Guyana

Variety Recommendations...

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Cane Growing Area	Harvesting Period	Light Soils	Clay Loams	Clays	Cane Growing Area	Harvesting Period	Light Soils	Clay Loams	Clays
		BJ7015	BJ7015	BJ7015			BJ7314	BJ7314	BJ7314
		BT80311	BJ7504	BJ7504			BJ7015	BJ7015	BJ7015
		BJ7314	BJ7314	BJ7314			BJ82105	BJ7465	BJ7465
	Early	BJ7465	BJ7465	BJ7465		Early	BJ7938	BJ7938	BJ7938
		BJ7627	BJ7627	BJ7627			BJ78100	BJ78100	CR892023
		CR892023	CR892023	CR892023			CR892023	CR892023	
			BT80311	BT80311				BJ82105	
		BJ7465	BJ7465	BJ7465			BJ7262	BJ78100	BJ7627
Upper		BJ82119	BJ82119	BJ82119			BJ7465	BJ7465	BJ7465
St. Catherine		BJ7262	BJ7262	BT80311	St. Elizabeth		BJ82105	BJ82105	BJ82105
& Upper	Middle	BT80311	BT80311			Middle	BJ78100	BJ7504	BJ7504
Clarendon							BJ7938	BJ7938	BJ7938
							BJ7627	BJ7627	
							BJ82105	BJ82105	
		BJ7627	BJ7627	BJ7627			BJ7465	BJ7465	BJ7465
		BJ8783	BJ8783	BJ8783			BJ7627	BJ7627	BJ7627
	Late	BJ7015	BJ7015	BJ7015		Late	BJ7314	BJ7314	BJ7314
							BJ82105	BJ82105	
							BJ78100	BJ78100	

ORANGE RUST CONTROL

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disease to allow for selection of resistant varieties. We are therefore at the start of this selection process.

Accordingly, this year the Institute virtually duplicated its Stage I variety trial. One was planted as usual in the Irrigated zone and should provide the usual number of selections for Stage II trials. The second was taken to the heart of the orange rust epidemic at Worthy Park. This latter trial is of particular significance to the breeding programme. It is expected that most of the seedlings planted could succumb to the disease. Of particular importance is that it will permit a quick assessment of which families show signs of resistance - information desperately needed by the Breeding Station in Barbados to guide them in selecting parents for future crosses. With the intensity of the disease at Worthy Park, it is expected that any family showing resistance in that valley is likely to possess that all important gene for resistance.

Orange rust infection at the height of the outbreak in 2009, Worthy Park

Given the long process of breeding and selection however, it will take more than 12 years before disease resistant varieties emerging from this process reach the hands of growers. Unfortunately, there is no short cut to the process. When resistant varieties have been clearly identified, the multiplication process may be speeded up by tissue culture techniques ✪

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